Natural Area
CONSULTING MANAGEMENT SERVICES

UDLA

City of Stirling Coastal Boardwalk Feasibility Study

Environmental Survey Autumn 2025

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Acknowledgement of Country

Ngala kaaditj Noongar moort keyen kaadak nidja boodja.
Natural Area acknowledges the Traditional Owners of the lands on which we operate, and recognises their continuing connection to lands, waters and communities.

Disclaimer

System Certifications

Environmental management system registered to ISO 14001:2015
Quality management system registered to ISO 9001:2015
Occupational health and safety management system registered to ISO 45001:2018

Document Title	UDLA-R Stirling Boardwalk Concept Study Environmental Survey
Location	UDLA/2025 03 046 City of Stirling Boardwalk Concept Study/6. Reporting/UDLA-R Stirling Boardwalk Concept Study Environmental Survey.docx

Version	Date	Changes	Prepared by
Final Version	30/07/2025	-	Natural Area

Executive Summary

Natural Area Consulting Management Services (Natural Area) was contracted by UDLA to undertake a reconnaissance flora survey and basic fauna survey of a portion of Trigg Beach. The survey of the site will assist in determining environmental values on site and considerations for future development and to address components identified in the gap analysis in the *Preliminary Environmental Opportunities and Constraints Assessment* (Coterra Environment, 2024). The results from the survey will assist in informing the concept design for the Stirling Boardwalk which will provide a connection between Trigg Beach and Scarborough Beach.

The survey of the concept design study area determined:

- A total of 67 flora species comprised of 24 (36 %) introduced (weeds) and 43 (64 %) native flora species.
- A total of three vegetation types:
  - *Olearia axillaris* shrubland and **Ammophila arenaria* tussock grassland (OaSAaG)
  - *Olearia axillaris* and *Scaevola crassifolia* shrubland (OaScS)
  - *Acacia rostellifera*, *Olearia axillaris* and *Spyridium globulosum* shrubland over *Lepidosperma gladiatum* sedgeland (ArOaSgSLgS).
- Vegetation condition ranged from completely degraded to very good.
- The presence of the previously recorded threatened ecological community *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands of the Swan Coastal Plain (floristic community type 30a as originally described in Gibson *et al*. 1994) listed as Critically Endangered under the *Biodiversity Conservation Act 2016* (WA) (BC Act).
- A total of 10 fauna species opportunistically observed.
- Suitable fauna habitat providing foraging and refuge for reptiles, birds and mammals.
- Two declared pests listed under the *Biosecurity and Agriculture Management Act 2007* (WA) (BAM Act):
  - Red Fox (**Vulpes vulpes*)
  - Rabbit (**Oryctolagus cuniculus*).

It is recommended that the concept design for the boardwalk mitigates environmental damage where possible by avoiding direct and indirect impacts to the threatened ecological community and vegetation in very good condition. The design should not alter any hydrological regimes that will impact the continuation of the threatened ecological community, and no disturbances should occur within a 15 m buffer of the community. Disturbances to vegetation in a very good and good condition should be mitigated where possible, prioritising the retention of vegetation in very good condition.

An assessment of proposed 'Journey A' and 'Journey B' outlines that 'Journey A' is likely to have a higher impact on the threatened ecological community and very good condition mature vegetation located near the existing principal shared path. In comparison, 'Journey B' is likely to have a lower impact on the threatened ecological community and a lower impact on very good condition vegetation in various levels of maturity. However, 'Journey B' will likely have a higher impact on habitat fragmentation, this impact can be mitigated in the boardwalk design.

The boardwalk should ensure that it does not fragment the existing fauna habitat by allowing fauna species to move underneath to retain the habitat connectivity of the site. If lighting is to be utilised across the boardwalk the design should follow recommended practices to mitigate the impact on the physiological and behavioural processes of native fauna species. It is recommended that vegetation in degraded and completely degraded condition across the site are prioritised for revegetation, aiming to improve the condition to good or better. A site-specific revegetation plan is recommended to be developed for the site and outline suitable site preparation techniques, vegetation establishment, completion criteria, maintenance activities, contingency plans, and timeframes. Feral animal control should be undertaken across the site by a licenced vertebrate pest technician to mitigate the impact of declared pests on the environment.

Contents

1.0 Introduction

Natural Area Consulting Management Services (Natural Area) was contracted by UDLA to undertake a reconnaissance flora survey and basic fauna survey of a portion of Trigg Beach. The survey of the site will assist in determining environmental values on site and considerations for future development and to address components identified in the gap analysis in the *Preliminary Environmental Opportunities and Constraints Assessment* (Coterra Environment, 2024). The results from the survey will assist in informing the concept design for the Stirling Boardwalk which will provide a connection between Trigg Beach and Scarborough Beach.

1.1 Location

The study area is approximately 15.51 ha and is located 12 km north-west of the Perth Central Business District (CBD). The study area is bound by Trigg Beach carpark to the north, West Coast Hwy to the east and Scarborough Beach foreshore to the south (Figure 1).

The study area is within a Class A Reserve and is an environmentally sensitive area with a recorded threatened ecological community and Bush Forever area (Department of Water and Environmental Regulation (DWER), 2021). The site intersects with the Bush Forever Site Trigg Bushland and Adjacent Coastal Reserve, Trigg/Scarborough (ID 308). The site is reserved as Regional Open Space (ROS) under the Metropolitan Region Scheme (MRS). The purpose of ROS under the MRS is "to protect the natural environment, provide recreational and cultural opportunities, safeguard important landscapes and sites of cultural or historical significance and provide for public access*".*

1.2 Legislative Context

State and Federal environment-related laws impact how environmental values are governed in Western Australia. The following legislation and policies are relevant to this report.

1.2.1 Relevant Legislation

***Aboriginal Heritage Act 1972* (WA)**

The Aboriginal Heritage Act 1972 (WA) makes provision for the recognition, protection, conservation, and preservation of Aboriginal heritage in Western Australia.

***Biosecurity and Agriculture Management Act 2007* (WA)**

The *Biosecurity and Agriculture Management Act 2007* (WA) (BAM Act) regulates the framework for plant and animal pest and disease biosecurity in Western Australia. The framework provides for the control of declared flora and fauna species (declared organisms) that are known to be a significant environmental threat and the management, control and prevention of these declared plants and animals.

***Biodiversity Conservation Act 2016* (WA)**

The *Biodiversity Conservation Act 2016* (WA) (BC Act) aims to protect and conserve biodiversity as well as to promote the ecologically sustainable use of biodiversity components in the State. The BC Act provides the statute relating to conservation and legal protection of flora, fauna, and ecological communities. The BC Act follows the principles of ecologically sustainable development, detailing that decision-making processes

should effectively integrate long-term and short-term economic, environmental, social, and equity considerations.

***Environmental Protection Act 1986* (WA)**

The *Environmental Protection Act 1986* (WA) (EP Act) provides for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement, and management of the environment connected with the foregoing. The Environmental Protection Authority (EPA) is established under this act and provides a structured policy framework that is consistent with the EP A*ct*. The EPA produces the guidelines and procedures associated with conducting environmental assessments in line with the EP Act.

***Environment Protection and Biodiversity Conservation Act 1999* (Cth)**

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) serves to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places. The primary objective of the EPBC Act is to promote the conservation of biodiversity and the sustainable use of natural resources while allowing for ecologically sustainable development. The EPBC Act allows for the creation of conservation agreements between the Australian government and individuals, communities, or organisations to support the conservation of biodiversity.

***Soil and Land Conservation Act 1945* (WA)**

The *Soil and Land Conservation Act 1945* (WA) serves to conserve soil and land resources, and to mitigate the impacts of erosion, salinity, and flooding. This Act outlines the mitigation and prevention of land degradation, promoting soil conservation and land management and the administration of Land Conservation District Committees (LCDC).

1.2.2 Relevant Planning and Policy

Australian Weeds Strategy 2017-2027

The Australian Weeds Strategy 2017-2027 provides a strategic framework for managing weeds at a national level (Invasive Plants and Animals Committee, 2016). As part of the implementation of the National Weeds Strategy, 32 Weeds of National Significance are identified as nationally agreed priority plant species for control and management based on the criteria of invasiveness and impact characteristics, potential and current area of spread and economic, environmental, and social impacts.

Australia's Biodiversity Conservation Strategy 2010-2030

Australia's Biodiversity Conservation Strategy 2010-2030 aims to protect biological diversity and maintain ecological processes and systems (Natural Resource Management Ministerial Council, 2010).

Figure 1:
Survey Area and Bush Forever Area

Trigg Beach, City of Stirling

Legend

- Bush Forever Area
- Study Area

Client:	UDLA
Date:	21/05/2025
Created by:	Natural Area
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

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2.0 Site Characteristics

2.1 Regional Context

The site is located within the Swan Coastal Plain (SWA02) IBRA subregion (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2025a). This region is characterised by low lying coastal plain covered with woodlands. This subregion is generally comprised of colluvial and aeolian sands, alluvial river flats, and coastal limestone. Where heath and/or Tuart woodlands are recorded on limestone, Banksia and Jarrah woodland on quaternary marine dunes, and Marri woodlands on colluvial and alluvial sands (Mitchell *et al.*, 2002).

2.2 Climate

The survey area is within the Mediterranean climatic zone, which is characterised by dry, hot summers and cool, wet winters. The nearest to the Bureau of Meteorology (BoM) weather station is Swanbourne (site number 009215) located approximately 8 km south of the survey area (BoM, 2025). The long-term average climate conditions recorded at this weather station between 1993 and 2025 are:

- Rainfall of 719.5 mm per annum, with majority of rainfall between May and September
- Maximum temperature range of 18.5 °C in winter to 30.4 °C in summer
- Minimum temperature ranging from 10.0 °C in winter to 18.8 °C in summer.

The long-term average climate conditions recorded from 1993 to 2025 are displayed in Figure 2 with comparison to the 2024 rainfall data.

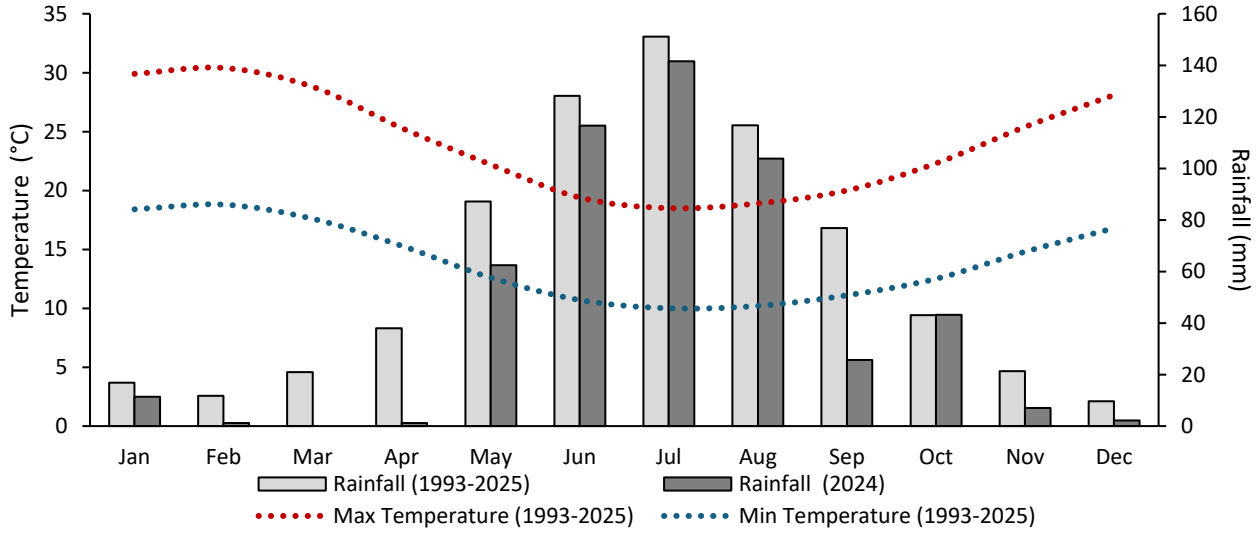

Figure 2: Temperature and rainfall data for Swanbourne site number 009215. Source: BoM, 2025.

2.3 Topography and Soils

The survey area occurs on the Quindalup South System (Department of Primary Industries and Regional Development (DPIRD), 2022a) with a total of two soil types were identified at site; the EnvGeol S1 phase and EnvGeol S2 phase (DPIRD, 2022b) (Table 1 and Figure 3). The site ranges from 4 m Australian Height Datum (AHD) in the west and gently rises towards the east to a maximum of 20 m AHD in the south-east corner (DPIRD, 2019).

Table 1: Soil types within site

Name	Symbol	Description
EnvGeol S1 phase	211Qu__S1	CALCAREOUS SAND - white, fine to medium-grained, sub-rounded quartz and shell debris, of eolian origin
EnvGeol S2 phase	211Qu__S2	CALCAREOUS SAND - white, fine to medium-grained, sub-rounded quartz and shell debris, of eolian origin

2.4 Vegetation Complex

One vegetation complex exists within the site boundary, Quindalup Complex. It is described by Heddle *et al.* (1980) as a coastal dune complex consisting mainly of two alliances - the strand and fore-dune alliance and the mobile and stable dune alliance. Local variations include the low closed forest of *Melaleuca lanceolata* (Rottnest Teatree) and *Callitris preissii* (Rottnest Island Pine), the closed scrub of *Acacia rostellifera* (Summer-scented Wattle) and the low closed *Agonis flexuosa* (Peppermint) forest of Geographe Bay. The pre-European extent of this vegetation complex remaining is:

- 60.49 % within the Swan Coastal Plain
- 23.54 % within the City of Stirling (Government of Western Australia, 2019).

2.5 Black Cockatoo Habitat

There is the potential for the three threatened black cockatoos and their habitat to occur on site, including the Carnaby's Cockatoo (*Zanda latirostris*) and Baudin's Cockatoo (*Zanda baudinii*) listed as Endangered under the EPBC Act and the BC Act, and the Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) listed as Vulnerable under the EPBC Act and the BC Act. The survey site occurs within an area classified as a Carnaby's Cockatoo Areas requiring investigation as feeding habitat in the Swan Coastal Plain IBRA Region (Department of Biodiversity, Conservation and Attractions (DBCA), 2018).

2.6 Hydrology

The study area has been identified as a high potential for terrestrial groundwater dependent ecosystem along the dunes in the eastern boundary and a small portion in the southeastern boundary identified as a low potential for terrestrial groundwater dependent ecosystems (BoM, 2019). The location of terrestrial groundwater dependent ecosystem is provided in Figure 4.

2.7 Ecological Linkage

The study area intersects with an ecological linkage (ID 1) (Western Australian Local Government Association (WALGA), 2004). The ecological linkage provides habitat connectivity in a regionally fragmented landscape connecting vegetation along the coast from Swanbourne to Two Rocks.

2.8 Heritage Values

The site is within the Whadjuk People Indigenous Land Use Agreement area. No listed heritage values are recorded within the survey area.

Figure 3:
Soil and Topography

Trigg Beach, City of Stirling

Legend

- Contours (2 m)
- 211Qu__S1
- 211Qu__S2
- Study Area

Client:	UDLA
Date:	21/05/2025
Created by:	Natural Area
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

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Figure 4:
Groundwater Dependent Ecosystem

Trigg Beach, City of Stirling

Legend

Groundwater Dependent Ecosystems
- High potential
- Moderate potential
- Low potential
- Study Area

Client:	UDLA
Date:	21/05/2025
Created by:	Natural Area
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

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3.0 Methodology

3.1 Desktop and Literature Review

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

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

The following databases were accessed to obtain relevant information:

- NatureMap (DBCA, 2025a)
- Protected Matters Search Tool (PMST) (DCCEEW, 2025b) (Appendix 1)
- FloraBase (WA Herbarium, 1998-)
- Threatened and priority flora database searches (DBCA, 2025b)
- Threatened and priority fauna database searches (DBCA, 2025c)
- Threatened and priority ecological community database searches (DBCA, 2025d).

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

3.2 On-ground Flora Survey

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

Natural Area environmental scientists undertook the survey on May 15, 2025, with key data recorded using QField software on a handheld tablet. Survey activities included:

- Traversing the entirety of the site and recording all species present, including native and invasive species.
- Marking locations of any conservation significant flora, declared pests and/or Weeds of National Significance identified.
- Recording vegetation type including dominant over, middle and understorey species to describe vegetation type in line with the National Vegetation Information System (NVIS) Level V – Association (Executive Steering Committee for Australian Vegetation Information (ESCAVI), 2003).
- Condition using the scale attributed to Keighery (Table 2) (EPA, 2016).
- The use of GPS to map significant species and boundaries of differing vegetation type and condition.
- Recording evidence of disturbance, such as fire.

Table 2: Vegetation condition ratings

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

Source: EPA, 2016.

3.3 On-ground Fauna Survey

The fauna survey was completed in accordance with a basic fauna survey as outlined in the *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020). Natural Area environmental scientists traversed the site on May 15, 2025, and undertook this survey in conjunction with other survey activities. A basic survey is defined as a low-intensity survey, which gathers broad fauna and habitat information including opportunistic fauna observations (EPA, 2020). The fauna survey included recording opportunistic sightings of fauna species while traversing the survey area, along with recording evidence of their presence in the form of:

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

3.4 Limitations

The limitations associated with the reconnaissance flora and vegetation survey and basic fauna survey undertaken in the survey area are outlined in Table 3.

Table 3: Survey limitations

Potential Limitation	Degree of Limitation	Comments
Availability of contextual information	None	Regional and local contextual information was readily available for the site.
Competency/ experience of team	None	Survey activities were undertaken by experienced environmental scientists who have extensive experience undertaking flora and fauna surveys within the Swan Coastal Plain IBRA region.
Proportion of flora recorded/ collected, any identification issues	Minor	A total of 67 flora species (taxa) were recorded from 29 families during the field survey, comprised of 24 introduced (weeds) and 43 native species. Of these, 1 species (1.5 %) was unable to be identified to species level due to a lack of diagnostic characteristics present at the time of survey. This species was able to be identified to genus level as **Lupinus* sp. which is introduced.
Survey effort and extent	None	The entire survey area was traversed by two environmental scientists over one day during the reconnaissance flora and vegetation survey and basic fauna survey.
Access restrictions	None	No access restrictions were present across the survey area.
Survey timing	Major	The survey was undertaken during autumn which is outside of the optimal season for flora surveys within the Swan Coastal Plain subregion. Due to the survey being undertaken outside of the recommended survey period annual species are likely to not be presenting during the survey and as such not recorded. Of the three conservation significant flora species identified in the desktop survey as being likely to occur within the survey area, two have flowering periods outside of the survey period. All of these species are perennial and would have identifiable features presenting at the time of the survey.
Disturbances	None	No recent disturbances which may have had an impact on survey results (e.g. fire, recent clearing or floods) were identified during the survey.

4.0 Flora Survey Results

4.1 Desktop Survey

A desktop survey of online databases indicated the potential for a total of 33 conservation significant species to occur within 10 km of the survey area (Table 4). NatureMap indicated 19 conservation significant flora species listed under the BC Act or by the Western Australian Herbarium (1998-), as potentially occurring within 10 km radius of the site (DBCA, 2025a). A review of the PMST (DCCEEW, 2025b) indicated 14 significant flora species listed under the EPBC Act as potentially occurring within a 10 km radius of the site (Appendix 1). A review of the DBCA (2025b) threatened and priority flora database indicated 17 threatened or priority species have been recorded within 10 km of the site.

Of the conservation significant species potentially found in the area, it was determined that the site conditions (soil type, drainage, location) may be suitable for three (highlighted green) of these species (Table 4). Conservation code descriptions are provided in Appendix 2.

Table 4: Threatened and priority flora species listed by NatureMap, PMST and DBCA

Species Name	Cons Code (WA)	Cons Code (Cth)	Nature Map	PMST	DBCA
Acacia benthamii	P2		X		X
Amanita brunneola	P2		X		X
Amanita carneiphylla	P3		X		X
Amanita preissii	P3		X		X
Andersonia gracilis	VU	EN		X	
Anigozanthos viridis subsp. *terraspectans*	VU	VU		X	
Austrostipa mundula	P3		X		X
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	P1		X		X
Banksia mimica	VU	EN		X	
Beyeria cinerea subsp. *cinerea*	P3		X		X
Caladenia huegelii	CR	EN		X	
Calothamnus graniticus subsp. *leptophyllus*	P4		X		
Calothamnus macrocarpus	P2		X		
Conostylis bracteata	P3		X		X
Diuris drummondii	EN	VU		X	
Diuris micrantha	VU	VU		X	
Diuris purdiei	EN	EN		X	
Dodonaea hackettiana	P4		X		X

Species Name	Cons Code (WA)	Cons Code (Cth)	Nature Map	PMST	DBCA
Drakaea elastica	CR	EN		X	
Drakaea micrantha	EN	VU		X	
Eleocharis keigheryi	VU	VU		X	
Eucalyptus argutifolia	VU	VU		X	
Eucalyptus foecunda subsp*. foecunda*	P4		X		X
Fabronia hampeana	P2		X		X
Hibbertia leptotheca	P3		X		X
Jacksonia sericea	P4		X		X
Lasiopetalum membranaceum	P3		X		X
Lepidium pseudohyssopifolium	P1		X		X
Macarthuria keigheryi	EN	EN		X	
Pimelea calcicola	P3		X		X
Stylidium maritimum	P3		X		X
Synaphea sp. Fairbridge Farm (D.Papenfus 696)	CR	CR		X	
Thelymitra stellata	EN	EN		X	

4.1.1 Threatened and Priority Ecological Communities

A review of the PMST report and DBCA database search identified four listed threatened ecological communities under the EPBC Act and seven listed priority and threatened ecological communities under the BC Act that could potentially occur within 10 km of the site. (Table 5). One threatened ecological community *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands of the Swan Coastal Plain (floristic community type 30a as originally described in Gibson *et al.* 1994) listed as Critically Endangered under the BC Act has been previously recorded within the site, occurrence Scarbr01.

Table 5: Potential threatened and priority ecological communities within the 10 km of Trigg Beach Study Area. Threatened ecological community recorded previously within the study area are highlighted green

Commonwealth Name	State Name	Cons Code (Cth)	Cons Code (WA)
Banksia Woodlands of the Swan Coastal Plain ecological community	Banksia attenuata woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson *et al*. 1994)	Endangered	Critically Endangered
	Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Priority 3
Empodisma peatlands of southwestern Australia		Endangered	
Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion	*Melaleuca huegelii – M. systena* shrublands of limestone ridges (floristic community type 26a as originally described in Gibson *et al.* 1994)	Critically Endangered	Critically Endangered
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain	Critically Endangered	Priority 3
	Acacia shrublands on taller dunes		Priority 3
	Callitris preissii (or *Melaleuca lanceolata*) forests and woodlands of the Swan Coastal Plain (floristic community type 30a as originally described in Gibson *et al.* 1994)		Critically Endangered
	Northern Spearwood shrublands and woodlands	Endangered	Priority 3

4.2 Flora Survey Results

4.2.1 Flora

A total of 67 flora species (taxa) were recorded from 29 families during the field survey, comprising of 24 introduced (weeds) and 43 native species. Examples of native flora species are shown in Figure 5 and weed species in Figure 6. A complete flora species list is provided in Appendix 4. No conservation significant flora species were recorded across the survey area and no declared pests or Weeds of National Significance were identified within the site.

Olearia axillaris (Coastal Daisybush) | *Acanthocarpus preissii*

Leucophyta brownii | *Rhagodia baccata* subsp. *baccata* (Berry Saltbush)

Figure 5: Examples of native flora species recorded.

Sea Spinach (*_Tetragonia decumbens_)

Sea Rocket (*_Cakile maritima_)

*_Aeonium arboreum_

Sweet Alyssum (*_Lobularia maritima_)

Rose Pelargonium (*_Pelargonium capitatum_)

Beach Evening Primrose (*_Oenothera drummondii_)

Figure 6: Examples of introduced flora species recorded.

4.2.2 Vegetation Types

A total of three vegetation types were recorded within the survey area. *Olearia axillaris* shrubland and **Ammophila arenaria* tussock grassland (OaSAaG) was recorded towards the western boundary with the *Acacia rostellifera*, *Olearia axillaris* and *Spyridium globulosum* shrubland over *Lepidosperma gladiatum* sedgeland (ArOaSgSLgS) recorded to the eastern boundary adjacent to the current principal shared path next to the West Coast Hwy. *Olearia axillaris* and *Scaevola crassifolia* shrubland (OaScS) was recorded primarily between OaSAaG and ArOaSgSLgS within the undulating dunes. Vegetation types are described in Table 6 and shown in Figure 8.

Table 6: Vegetation type within the study area

Vegetation Type	Description	Photograph
Olearia axillaris shrubland and **Ammophila arenaria* tussock grassland (OaSAaG)	*A shrubland of Olearia axillaris with a grassland of *Ammophila arenaria* over *Carpobrotus virescens*.	
Olearia axillaris and *Scaevola crassifolia* shrubland (OaScS)	A shrubland of *Olearia axillaris*, *Scaevola crassifolia*, and *Rhagodia baccata* shrubland over open heathland of *Acanthocarpus preissii* and open tussock grasses of *Spinifex longifolius*.	

Vegetation Type	Description	Photograph
Acacia rostellifera, *Olearia axillaris* and *Spyridium globulosum* shrubland over *Lepidosperma gladiatum* sedgeland (ArOaSgSLgS)	A shrubland of *Acacia rostellifera*, *Olearia axillaris* and *Spyridium globulosum* over sedgeland of *Lepidosperma gladiatum.*	

4.2.3 Vegetation Condition

Vegetation condition on site ranged from completely degraded to very good (Table 7, Figure 9). The vegetation OaSAaG recorded to the west of the survey area was in a degraded to completely degraded condition with the vegetation comprised of high abundances of the introduced **Ammophila arenaria*. Degraded vegetation was also recorded within the low-lying areas of the dunes containing high weed loads and low densities of native flora species (Figure 7). Vegetation in very good condition was recorded primarily in the east portion of the site adjacent to the West Coast Hwy and the principal shared path. This vegetation contained a high coverage of native flora species with only the presence of some weed species.

Table 7: Vegetation condition within the survey area

	Vegetation Condition						Total
	Pristine	Excellent	Very Good	Good	Degraded	Completely Degraded	
Area (ha)	0.00	0.00	4.64	3.85	1.20	1.46	11.15
Area (%)	0	0	42	34	11	13	100

Figure 7: Examples of vegetation in degraded condition.

Figure 8:
Vegetation Type

Trigg Beach, City of Stirling

Legend

- ArOaSgSLgS
- OaScS
- OaSAaG
- Tracks / Paths
- Study Area

Client:	UDLA
Date:	21/05/2025
Created by:	Natural Area
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

Figure 9:
Vegetation Condition

Trigg Beach, City of Stirling

Legend

- Very Good
- Good
- Degraded
- Completely Degraded
- Study Area

Client:	UDLA
Date:	21/05/2025
Created by:	Natural Area
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

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4.2.4 Threatened Ecological Community

The *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands of the Swan Coastal Plain (floristic community type 30a as originally described in Gibson *et al*. 1994) has been previously recorded within the survey area (occurrence Scarbr01). This community is listed as Critically Endangered under the BC Act.

Isolated individuals of *Callitris preissii* were recorded within the south-west portion of the ArOaSgSLgS vegetation type. Flora species recorded within the community included *Acacia rostellifera*, *Olearia axillaris*, *Myoporum insulare*, *Rhagodia baccata*, *Acanthocarpus preissii*, *Exocarpos sparteus*, *Spyridium globulosum*, and *Lepidosperma gladiatum*. The location of this threatened ecological community within the site historically could be the southern component of the recorded threatened ecological community in Trigg Bushland (occurrence TRIGG02) prior to the development of the West Coast Hwy.

A total of 15 *Callitris preissii* individuals were recorded within the site during the field survey with 3 *Callitris preissii* recorded dead. The coverage and location of *Callitris preissii* across the site are provided in Figure 10. The area containing *Callitris preissii* in the site is comprised of <10 % foliage coverage at a height class of <2 m tall. Two colour forms of *Callitris preissii* were recorded within the site indicating that the population is naturally occurring originating from two parent taxa. It is recommended that statistical analysis is undertaken to determine the floristic community type alignment against *Gibson et al.* (1994) and Keighery *et al.* (2012).

Figure 10:
Callitris preissii Locations

Trigg Beach, City of Stirling

Legend

- Dead *Callitris preissii*
- Alive *Callitris preissii*
- Alive Coverage *Callitris preisii*
- Threatened Ecological Community Boundary
- Study Area

Client:	UDLA
Date:	21/05/2025
Created by:	Natural Area
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

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5.0 Fauna Survey Results

5.1 Desktop Survey

A desktop survey of online databases indicated the potential for a total of 91 conservation significant fauna species to occur within 10 km of the survey area (Table 8). NatureMap indicated 65 conservation significant species listed under the BC Act as potentially occurring within a 10 km radius of the site (DBCA, 2025a). The PMST indicated 48 threatened species listed under the EPBC Act as potentially occurring within a 10 km radius of the site (DCCEEW, 2025b) (Appendix 1). A review of the DBCA threatened and priority fauna species database indicated the potential for 65 conservation significant fauna species to occur within a 10 km radius of the site (DBCA, 2025c).

Both abiotic (soil, climate) as well as biotic (food resources, predator pressure) will determine the suitability of habitats for specific fauna assemblages, based on their ecological requirements. Evaluating the site locality, existing conditions and known home ranges. Natural Area determined that the following seven species (highlighted green in Table 8) have the potential to be present within the survey site. Conservation significant migratory shorebirds may be infrequent visitors of the site and have the potential to utilise the area for foraging or nesting.

Table 8: Threatened and priority fauna species listed by NatureMap, PMST and DBCA

Species Name	Cons Code (WA)	Cons Code (Cth)	Nature Map	PMST	DBCA
Bird					
Actitis hypoleucos	MI	MI	X		X
Anous stolidus	MI	MI	X		X
Anous tenuirostris melanops	EN	VU	X	X	X
Apus pacificus	MI	MI	X		X
Ardenna grisea	MI	MI	X	X	X
Ardenna pacifica	MI	MI	X		X
Arenaria interpres	MI	VU & MI		X	
Botaurus dubius	P4		X		X
Botaurus flavicollis australis (south-west subpopulation)	P2		X		X
Botaurus poiciloptilus	EN	EN	X	X	X
Calidris acuminata	MI	MI	X	X	X
Calidris canutus	EN	VU & MI		X	
Calidris ferruginea	CR	CR & MI	X	X	X
Calidris subminuta	MI	MI	X		X

Species Name	Cons Code (WA)	Cons Code (Cth)	Nature Map	PMST	DBCA
Calidris tenuirostris	CR	VU & MI		X	
Calyptorhynchus banksii naso	VU	VU	X	X	X
Charadrius cucullatus	P4		X		X
Charadrius leschenaultii	VU	VU & MI		X	
Charadrius mongolus	EN	EN & MI		X	
Chlidonias leucopterus	MI	MI	X		X
Diomedea antipodensis gibsoni	EN	VU	X	X	X
Diomedea epomophora	VU	VU & MI		X	
Diomedea exulans	VU	VU & MI		X	
Falco peregrinus	OS		X		X
Halobaena caerulea		VU		X	
Hydroprogne caspia	MI	MI	X		X
Leipoa ocellata	VU	VU		X	
Limosa lapponica	MI	MI	X	X	X
Limosa limosa	MI	MI	X	X	X
Macronectes giganteus	MI	EN & MI	X	X	X
Macronectes halli	MI	VU & MI		X	
Ninox connivens connivens (southwest subpopulation)	P3		X		X
Numenius madagascariensis	CR	CR & MI		X	
Oceanites oceanicus	MI	MI	X		X
Onychoprion anaethetus	MI	MI	X		X
Oxyura australis	P4		X		X
Pachyptila turtur subantarctica		VU		X	
Pandion haliaetus	MI	MI	X		X
Phaethon rubricauda	MI & P4	MI		X	
Phoebetria fusca	EN	VU & MI		X	
Plegadis falcinellus	MI	MI	X		X
Pluvialis squatarola	MI	VU & MI		X	
Psophodes nigrogularis	EN or P4	EN	X		X
Pterodroma mollis		VU		X	

Species Name	Cons Code (WA)	Cons Code (Cth)	Nature Map	PMST	DBCA
Rostratula australis	EN	EN	X	X	X
Stercorarius antarcticus lonnbergi	P4		X		X
Sterna dougallii	MI	MI	X		X
Sterna paradisaea	MI	MI	X		X
Sternula albifrons	MI	VU & MI		X	
Sternula nereis nereis	VU	VU		X	
Thalassarche carteri	EN	VU & MI	X	X	X
Thalassarche cauta cauta	VU	EN & MI	X	X	X
Thalassarche cauta steadi	VU	VU & MI		X	
Thalassarche chlororhynchos	VU	MI	X		X
Thalassarche chrysostoma	VU	EN & MI	X		X
Thalassarche impavida	VU	VU & MI		X	
Thalassarche melanophris	EN	VU & MI		X	
Thalasseus bergii	MI	MI	X		X
Tringa glareola	MI	MI	X		X
Tringa nebularia	MI	MI	X	X	X
Tringa stagnatilis	MI	MI	X		X
Tyto novaehollandiae novaehollandiae	P3		X		X
Xenus cinereus	MI	VU & MI		X	
Zanda baudinii	EN	EN	X		X
Zanda latirostris	EN	EN	X	X	X
Invertebrate					
Australotomurus morbidus	P3		X		X
Hylaeus globuliferus	P3		X		X
Idiosoma sigillatum	P3		X		X
Synemon gratiosa	P4		X		X
Westralunio carteri	VU	VU	X		X
Mammal					
Arctocephalus tropicalis	VU	EN	X		X
Balaenoptera musculus	EN	EN & MI		X	
Bettongia penicillata ogilbyi	CR	EN		X	

Species Name	Cons Code (WA)	Cons Code (Cth)	Nature Map	PMST	DBCA
Dasyurus geoffroii	VU	VU	X	X	X
Eubalaena australis	VU	EN & MI	X	X	X
Hydromys chrysogaster	P4		X		X
Isoodon fusciventer	P4		X		X
Macroderma gigas	VU	VU		X	
Megaptera novaeangliae	CD & MI	MI	X		X
Myrmecobius fasciatus	EN	EN	X		X
Neophoca cinerea	EN	EN	X	X	X
Notamacropus irma	P4		X		X
Phascogale tapoatafa wambenger	CD		X		X
Physeter macrocephalus	VU	MI	X		X
Pseudocheirus occidentalis	CR	CR	X	X	X
Reptile					
Caretta caretta	EN	EN & MI	X	X	X
Chelonia mydas	VU	VU & MI	X	X	X
Dermochelys coriacea	VU	EN & MI	X	X	X
Eretmochelys imbricata	VU	VU & MI	X		X
Natator depressus	VU	VU & MI		X	
Neelaps calonotos	P3		X		X

5.2 Fauna Survey Results

5.2.1 Fauna

A total of 10 fauna species were opportunistically recorded across the survey area comprised of 7 birds, 2 mammals and 1 reptile. Fauna species recorded across the site are provided in Table 9 and examples of native fauna species are shown in Figure 11.

The presence of two declared pests were recorded within the site: Red Fox (**Vulpes vulpes*) and Rabbit (**Oryctolagus cuniculus*). Both of these species are recorded on the Western Australian Organism List as Declared Pest - s22(2), C3 - Management /Prohibited under the BAM Act. This control category outlines that management actions should be undertaken to alleviate the harmful impact of the organism, reduce the number or distribution of organism or prevent or control the spread of the organism (DPIRD, 2025).

Willie Wagtail (*Rhipidura leucophrys*)

Welcome Swallow (*Hirundo neoxena*)

Singing Honeyeater (*Gavicalis virescens*)

Spotted Turtle Dove (**Spilopelia chinensis*)

Figure 11: Fauna species observed across the survey area. *denotes introduced species.

Table 9: Fauna observations within the survey area. * denotes introduced species and declared pest are highlighted red

Family	Species Name	Common Name
Bird		
Artamidae	*Gymnorhina tibicen*	Australian Magpie
Cacatuidae	*Eolophus roseicapilla*	Galah
Columbidae	**Spilopelia chinensis*	Spotted Turtle Dove
Falconidae	*Falco cenchroides*	Australian Kestrel (Nankeen Kestrel)
Hirundinidae	*Hirundo neoxena*	Welcome Swallow
Meliphagidae	*Gavicalis virescens*	Singing Honeyeater
Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail
Mammal		

Family	Species Name	Common Name
Canidae	**Vulpes vulpes*	Red Fox
Leporidae	**Oryctolagus cuniculus*	Rabbit
Reptile		
Elapidae	*Pseudonaja affinis affinis*	

5.2.2 Fauna Habitat

One broad fauna habitat was recorded across the study area, a mixed coastal shrubland of variable habitat quality. High quality fauna habitat was recorded within the very good and good condition vegetation across the site with high strata complexity.

The vegetation across the site provides good foraging habitat and refuge for native birds, mammals, and reptiles. The low-lying shrubs provides refuge for reptiles and mammals with larger shrubs providing foraging and refuge for birds. Patches of dense leaf litter and logs were recorded across the site providing habitat for reptiles and refuge from predatory species. Fauna habitat observed across the survey area are provided in Figure 12.

The survey site occurs within an area classified as a Carnaby's Cockatoo Areas requiring investigation as feeding habitat in the Swan Coastal Plain IBRA Region (DBCA, 2018). Of the 67 flora species across the site a total of 4 are known suitable foraging species for Carnaby's Cockatoo (*Zanda latirostris*) and include **Romulea rosea*, *Agonis flexuosa, Callitris preissii,* and *Eucalyptus gomphocephala* (Department of Environment and Conservation (DEC), 2011; Department of Agriculture, Water and the Environment (DAWE), 2022). The survey area is unlikely to provide critical foraging habitat for black cockatoos due to the low occurrences of suitable foraging species. However, black cockatoos are likely to be infrequent, transient visitors to the survey area.

Figure 12: Fauna habitat recorded across the survey area; low lying shrubs (*left*), and leaf litter and logs (*right*).

6.0 Implications of Results

The current concept design includes two potential locations for the boardwalk. 'Journey A' is located adjacent to the principal shared path to the eastern boundary of the site and 'Journey B' is located with the reserve between the two dune systems. An indicative placement of the two journeys are provided in Figure 13.

Figure 13: Journey locations across the site. The locations are indicative and are not the actual design placement. Source: UDLA, 2025.

6.1 Flora and Vegetation

A total of 67 flora species were identified within the study area, this comprised of 24 (36 %) introduced (weeds) and 43 (64 %) native species. The study area contained three vegetation types: OaSAaG, OaScS, and ArOaSgSLgS. The vegetation condition ranged from completely degraded to very good, primarily composed of vegetation in very good condition recorded primarily to the western boundary of the survey area adjacent to the West Coast Hwy.

No conservation significant flora species were identified during the autumn survey. A total of three conservation significant flora species have been identified in the desktop assessment to potentially occur, of these two species have flowering periods outside of the survey period. All of the conservation significant species likely to occur are perennial and would have identifiable features presenting at the time of the survey.

6.1.1 Concept Design

It is recommended to minimise the extent of clearing across the site. If constructed, the coastal boardwalk should be designed across degraded and completely degraded vegetation and avoid vegetation in a very good condition where possible to mitigate environmental impact.

Vegetation present in ArOaSgSLgS is predominantly mature vegetation in a very good condition with a high diversity and density of native flora species. If this is cleared it would require intensive management and rehabilitation techniques to reinstate the vegetation to the same condition compared to the vegetation present in OaScS which had varying ages of maturity and was recorded primarily in good condition.

Currently, two concept designs are developed for the project 'Journey A' located adjacent to the existing principal shared path and 'Journey B' located through the centre of the dune system. 'Journey A' would require the clearing of ahigher portion of vegetation in very good condition and vegetation type ArOaSgSLgS, which is located adjacent to the existing principal shared path. 'Journey B,' however, can be positioned within vegetation in a degraded and completely degraded condition between the centre of the two dune systems primarily within vegetation type OaScS. The 'Journey B' location will minimise the clearing of vegetation in a very good condition.

A potential risk to vegetation if the boardwalk is constructed within the site includes trampling, accidental fire ignition, vandalism, and littering. It is recommended that these threats are considered during the design process, this includes the development of fencing to limit unrestricted access and to follow best practices and principles to minimize crime.

6.1.2 Rehabilitation

It is recommended that a detailed revegetation plan is prepared for the site to improve the condition across the entire site. The revegetation plan should be developed in line with *A Guide to Preparing Revegetation Plans for Clearing Permits* (DWER, 2018), and outline suitable site preparation techniques, vegetation establishment, completion criteria, maintenance activities, contingency plans, and timeframes.

Vegetation in degraded or completely degraded condition should be rehabilitated across the site to improve the condition to a minimum of good condition and decrease threats to the ecosystem from invasive weeds and erosion. Rehabilitation activities include undertaking weed control, dune stabilisation and revegetation utilising site-specific native flora species.

The *Olearia axillaris* shrubland and **Ammophila arenaria* tussock grassland (OaSAaG) is primarily in a completely degraded condition due to the high density of the introduced (weed) **Ammophila arenaria.* Despite **Ammophila arenaria* being an introduced species it provides dune stabilisation which is required to prevent erosion across the western portion of the site. It is recommended the detailed revegetation plan is developed to provide a staged recovery plan that progressively infills the vegetation with native plants that provides dune stabilisation and removes **Ammophila arenaria.*

The stormwater drain adjacent to West Coast Terrace creates threats to the dune system as it can facilitate the introduction of weeds, excess nutrients and erosion. The drainage outlet should be revegetated with nutrient stripping plants and consider the development of sediment basins to mitigate these threats. The

drainage outlet should be monitored to remove excess sediments or pollutant and manual removal of weeds. The drainage outlet should be considered within the revegetation plan.

The City of Stirling and Stirling Natural Environment Coastcare currently undertake restoration and weed management within the dunes. The City of Stirling should continue to maintain and enhance their relationship with the Stirling Natural Environment Coastcare as part of this project.

6.2 Threatened Ecological Communities

A threatened ecological community is known to occur within the site boundary, *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands of the Swan Coastal Plain (floristic community type 30a as originally described in Gibson *et al*. 1994). This threatened ecological community is listed as Critically Endangered under the BC Act. The occurrence located within the site is recorded as ID Scarbr01 and is considered to be representative of floristic community type 30a by DBCA and is a groundwater dependent ecosystem.

The threats to the *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands of the Swan Coastal Plain include clearing, altered fire regimes, weed invasion, altered hydrological processes, grazing, and disease. The current threatened ecological community extent includes minor weeds present however, weed invasion if not managed can be aggressive and alter the floristic community.

A statistical analysis of the vegetation against Gibson *et al.* (1998) and Keighery *et al.* (2012), should be undertaken to determine the floristic community type of the vegetation. The statistical analysis should utilise quadrat data collected during spring and be undertaken in line with the *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016) and *Methods for survey and identification of Western Australian threatened ecological communities* (DBCA, 2024).

6.2.1 Recommended Buffer

Currently, there is no legislation or policy that outlines general buffer requirements for threatened ecological communities listed under the BC Act. The *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands of the Swan Coastal Plain (floristic community type 30a as originally described in Gibson *et al*. 1994) does not have any formally listed buffer requirements. Instead, buffer consideration should be determined based on ecological best practice and tailored to the characteristics of the site and surrounding land use.

An assessment of existing buffer requirements and determinations for other environmental values was undertaken along with an assessment of the site characteristics to determine an adequate buffer for this threatened ecological community. The *Draft guideline for the determination of wetland buffer requirements* (Western Australian Planning Commission, 2005) outlines the recommended buffers of wetlands and land uses which will enhance or maintain the attributes of the wetland. Wetland values are typically at a lower elevation to infrastructure and have a high subjectivity to negative impacts from surface flows. The guideline recommends that conservation category wetland have ≥ 50 m separation and/or management buffer to improve aesthetics and barrier, and 6-50 m for firebreaks. This guideline recommends resource enhancement wetland to have a separation and/or management buffer of 10-50 m to improve aesthetics and barrier, and 6 m for a firebreak. No recommended buffer is outlined for the development of fences or paths to control access within the wetland categories.

In the Swan Coastal Plain metropolitan region, edge effects are typically observed up to at least 25 metres into natural vegetation (Karen Clarke, pers. comm. July 2003 as cited in Del Marco *et al*., 2004). Due to the size and the location of the community, the entirety of the site is subjected to edge effects. The viability of natural vegetation can be activity managed to mitigate edge effects (Del Marco *et al*., 2004). Currently, the City of Stirling undertakes management techniques to mitigate edge effects and maintain the viability of the vegetation within the site. The *Trigg Bushland Reserve Callitris preissii woodland Threatened Ecological Community Management Recommendations* (Natural Area, 2018) developed in consultation with the Friends of Trigg Bushland recommends that maintenance actions occur within a 50 m buffer around the community.

An alignment of 15 m outside of the threatened ecological community is considered an adequate separation to avoid indirect impacts to the threatened ecological community based on the site characteristics including elevation, landforms, vegetation condition, and existing infrastructure. This 15 m buffer aligns with the recommendation provided in the *Preliminary Environmental Opportunities and Constraints Assessment* (Coterra Environment, 2024). The landscape to the west of the threatened ecological community is located at a lower elevation. As such, impacts from a constructed boardwalk in this area are unlikely to influence the hydrological regimes or surface water flows. The edge of the 15 m buffer to the west of the community primarily falls within vegetation in a degraded condition, with very good condition vegetation located within the 15 m buffer. This indicates that the 15 m buffer provides adequate separation from the threatened ecological community to support key ecological processes by maintaining habitat and reducing edge effects. To the east of the community, at a higher elevation, infrastructure and development already exists within the 15 m buffer. The existing principal shared path is located less than 4 m from the threatened ecological community. As the site is actively managed by the City of Stirling edge effects have been mitigated within the threatened ecological community through ongoing management practices.

Based on the availability of information surrounding buffers, it is recommended that no infrastructure development or disturbances occur within 15 m of the threatened ecological community. Where possible, a buffer distance of 50 m of the mapped boundary should be maintained following the guidance outlined in the *Trigg Bushland Reserve Callitris preissii woodland Threatened Ecological Community Management Recommendations* (Natural Area, 2018). If the proposed infrastructure is to be constructed within 15 to 50 m of the community, a barrier should be installed to prevent and mitigate potential disturbance from unauthorised access. Design recommendations for each buffer distance are provided in Table 10. The location of the recommended buffers are displayed in Figure 14.

Regardless of the final placement of the design, rehabilitation works must be implemented within a 50 m radius to enhance vegetation condition and mitigate the impact of edge effects. These rehabilitation efforts may include, but are not limited to, weed control, revegetation, and dune stabilisation. The rehabilitation efforts should be incorporated into a specific management plan developed for the survey area. It is recommended that DBCA is consulted as part of the management plan to ensure compatibility with conservation objectives and to support ongoing protection and viability of the threatened ecological community.

Table 10: Recommended buffers and associated design recommendations

Buffer	Design Recommendation
< 15 m	No impact to the vegetation is to occur.
15-50 m	A barrier must be present to prevent unauthorised access and potential disturbances to the threatened ecological community.
> 50 m	Infrastructure is appropriately setback, management strategies must be undertaken within the buffered area, focusing on active restoration and management to limit potential edge effects.

6.2.2 Concept Design

The concept design for 'Journey A' is adjacent to the current principal shared path and is located at a higher elevation from the threatened ecological community with individuals of *Callitris preissii* located less than 4 m from the existing path. A key threatening process of *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands of the Swan Coastal Plain (floristic community type 30a as originally described in Gibson *et al*. 1994) threatened ecological community is altered hydrological regimes. The disturbances and the removal of native vegetation uphill from the community will alter the flow of surface water and the hydrological regimes which will likely lead to a negative and irreversible impact on the continuation of the community. If 'Journey A' is to be developed a detailed hydrological study is to be undertaken prior to infrastructure development as altered hydrological processes is a listed key threatening process for the threatened ecological community and substantial targeted mitigation actions would be required to be developed.

The concept design for 'Journey B' is located at a lower elevation from the threatened ecological communities and can be positioned outside of the 15 m buffer. 'Journey B' is unlikely to alter the hydrological regimes of the threatened ecological community or impact surface flows into the community.

An assessment of the two design locations against the *Guideline for assessing risks to the conservation of biodiversity associated with threatened species and threatened ecological communities* (DBCA, 2023), determined that 'Journey A' risk evaluation was calculated as a very high risk with a likelihood score of 4 (likely) and a consequence score of 5 (severe). A risk evaluation of 'Journey B' was determined to have a likelihood score of 2 (unlikely) and a consequence score of 3 (moderate) calculating a low risk. The likelihood and consequence definition and scores are provided in Table 11 and Table 12 respectively, with the risk matrix provided in Table 13.

Table 11: Likelihood definitions and scores

Likelihood	Score	Definition
Remote	1	Reasonable confidence (e.g. prior evidence) that the consequence level will not fully occur or be exceeded within the timeframe but not impossible (indicative probability: <5 %).
Unlikely	2	Reasonable confidence that the consequence level is not expected to fully occur or be exceeded within the timeframe (indicative probability: 5-19 %).
Possible	3	Reasonable confidence that the consequence level will only fully occur or be exceeded in some circumstances within the timeframe (Indicative probability: 20-49 %).

Likelihood	Score	Definition
Likely	4	Reasonable confidence of a greater probability than not of the consequence level fully occurring or being exceeded within the timeframe (indicative probability: 50-79 %).
Probable	5	The consequence level is expected to fully occur or be exceeded in the timeframe (indicative probability; 80-100 %).

Source: DBCA, 2023.

Table 12: Consequence definition and scores

Consequence	Score	Definition
Negligible	1	Minimal impact to any conservation attribute with no measurable effect on the objective.
Minor	2	Measurable by minor impact to some conservation attributes with minimal overall effect on the objective.
Moderate	3	Maximum acceptable level of impact to any conservation attribute that will still achieve the objective.
Major	4	Above acceptable level of impact to any conservation attribute that will lead to a negative but reversible effect on the objective.
Severe	5	Above acceptable level of impact to one or more conservation attribute (s) that will lead to a negative and irreversible effect on the objective.

Source: DBCA, 2023.

Table 13: Consequence-likelihood risk evaluation matric. Numbers highlighted blue = insignificant risk, green = low risk, yellow = moderate risk, orange = high risk, and red = very high risk.

	Likelihood				
Consequence	**Remote (1)**	**Unlikely (2)**	**Possible (3)**	**Likely (4)**	**Probable (5)**
Negligible (1)	1	2	3	4	5
Minor (2)	2	4	6	8	10
Moderate (3)	3	6	9	12	25
Major (4)	4	8	12	16	20
Severe (5)	5	10	15	20	25

Source: DBCA, 2023.

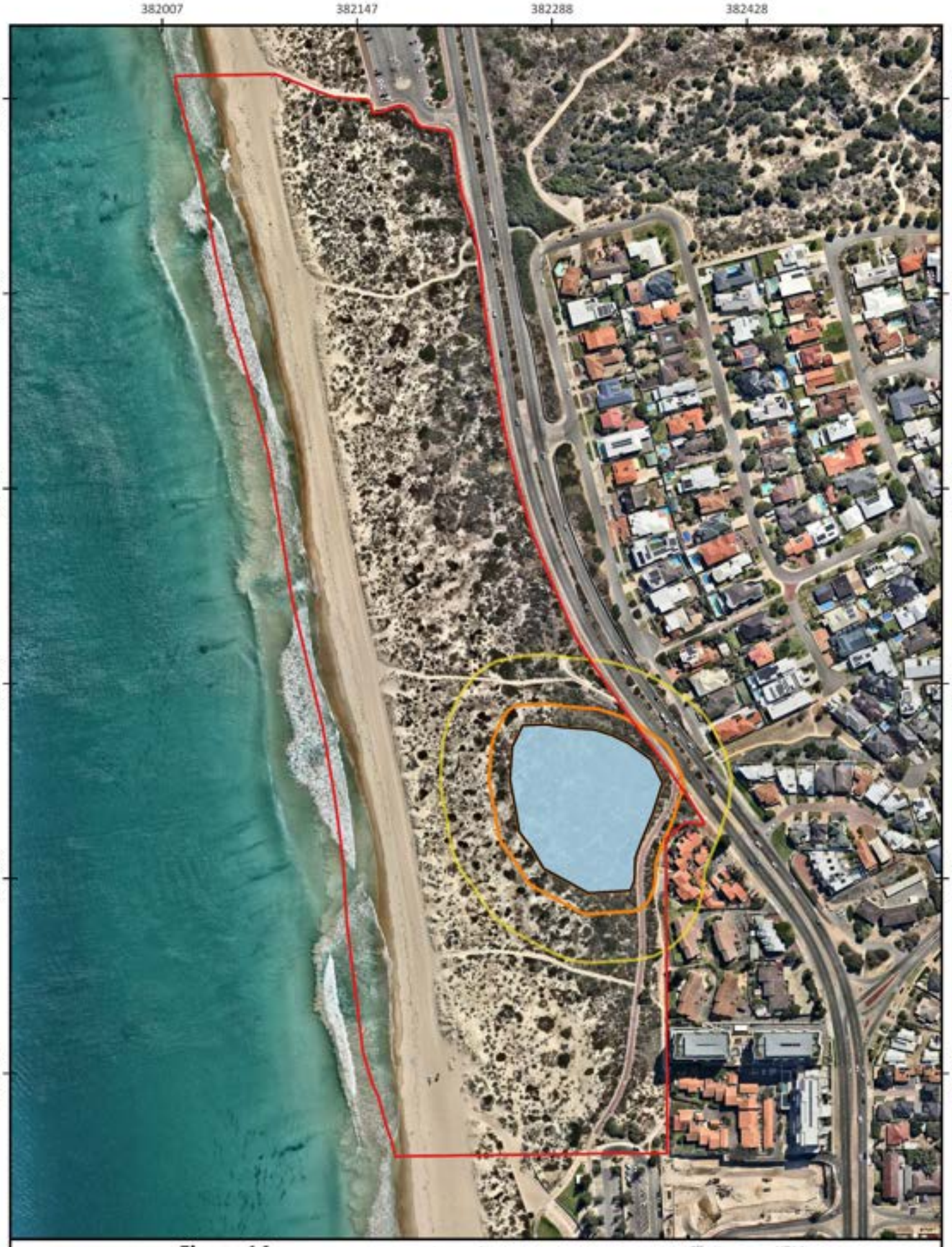

Figure 14:
Recommended Buffer Zones for the Threatened Ecological Community

Trigg Beach, City of Stirling

Legend

- 15 m Buffer
- 50 m Buffer Line
- Threatened Ecological Community Boundary
- Study Area

Client:	UDLA
Date:	21/05/2025
Created by:	Natural Area
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

6.3 Fauna

A total of 10 fauna species were opportunistically observed across the survey area. The survey area provides middle and understorey values across the site for native fauna species providing suitable refuge, foraging habitat and habitat connectivity. A sealed road (West Coast Hwy) to the east of the study area provides a high disturbance from anthropogenic traffic with infrastructure development to the south of the study area (along Scarborough Beach) and infrastructure to the north (along Trigg Beach). These infrastructures indicate that the vegetation within the study area provides high quality habitat compared to the surrounding land uses. The remnant vegetation provides refuge for fauna species and supports ecosystem services within a developed area.

It is important to mitigate habitat fragmentation by designing the boardwalk to allow for the movement of fauna species within the vegetation and does not fragment the vegetation. Boardwalks should be elevated at least 0.5 m off the ground for majority of the site to allow for the movement of terrestrial fauna including conservation significant species such as the Quenda (*Isoodon fusciventer)* and Black-striped Burrowing Snake (*Neelaps calonotos)*. Raised boardwalks also direct footfall which can assist in reducing the potential degradation of the vegetation from trampling or erosion.

Lighting consideration in the concept design should limit disruption to native fauna species where possible. Artificial light can disrupt behaviour and physiological changes in fauna species, including breeding and reproduction activities (Russart & Nelson, 2018). Lighting design should follow best practice principles (DCCEEW,2023), including:

- Lighting is only included where required.
- Lighting has time sensors.
- Only areas intended for usage are lit to avoid light spill.
- Lighting is at the lowest intensity.
- Lighting has little or no blue wavelengths.

A total of two declared pests were recorded across the survey area: Red Fox (**Vulpes vulpes*) and Rabbit (**Oryctolagus cuniculus*). Both of these species are recorded on the Western Australian Organism List as Declared Pest - s22(2), C3 - Management/Prohibited under the BAM Act. This control category outlines that management actions should be undertaken to alleviate the harmful impact of the organism, reduce the number or distribution of organism or prevent or control the spread of the organism (DPIRD, 2025). Feral animal control is recommended to be undertaken across the site by a licenced vertebrate pest technician following best practices.

7.0 References

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Appendix 1: PMST Report 10 km

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 23-Apr-2025

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	68
Listed Migratory Species:	64

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	89
Commonwealth Heritage Places:	2
Listed Marine Species:	96
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	13
Regional Forest Agreements:	None
Nationally Important Wetlands:	3
EPBC Act Referrals:	33
Key Ecological Features (Marine):	2
Biologically Important Areas:	11
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name	Buffer Status
Commonwealth Marine Areas (EPBC Act)	In buffer area only

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area	In feature area
Empodisma peatlands of southwestern Australia	Endangered	Community may occur within area	In buffer area only
Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion	Critically Endangered	Community likely to occur within area	In feature area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anous tenuirostris melanops			
Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In feature area
Ardenna grisea			
Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area	In buffer area only
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Diomedea exulans](#) Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Halobaena caerulea](#) Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Leipoa ocellata](#) Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Limosa lapponica menzbieri](#) Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Endangered	Species or species habitat known to occur within area	In feature area
[Limosa limosa](#) Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area	In buffer area only
[Macronectes giganteus](#) Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
[Macronectes halli](#) Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
[Pachyptila turtur subantarctica](#) Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Phaethon rubricauda westralis](#) Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Species or species habitat may occur within area	In feature area
[Phoebetria fusca](#) Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pluvialis squatarola Grey Plover [865]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Sternula albifrons Little Tern [82849]	Vulnerable	Species or species habitat may occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Xenus cinereus](#) Terek Sandpiper [59300]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
[Zanda latirostris listed as Calyptorhynchus latirostris](#) Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding known to occur within area	In feature area
INSECT			
[Hesperocolletes douglasi](#) Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area	In feature area
MAMMAL			
[Balaenoptera musculus](#) Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
[Bettongia penicillata ogilbyi](#) Woylie [66844]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Dasyurus geoffroii](#) Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Eubalaena australis](#) Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
[Macroderma gigas](#) Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In feature area
[Neophoca cinerea](#) Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat likely to occur within area	In feature area
[Pseudocheirus occidentalis](#) Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
PLANT			
[Andersonia gracilis](#) Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Anigozanthos viridis subsp. terraspectans Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Banksia mimica Summer Honeypot [82765]	Endangered	Species or species habitat may occur within area	In buffer area only
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat may occur within area	In buffer area only
Diuris drummondii Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area	In buffer area only
Drakaea elastica Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area	In feature area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Eucalyptus argutifolia Yanchep Mallee, Wabling Hill Mallee [24263]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macarthuria keigheryi Keighery's Macarthuria [64930]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Synaphea sp. Fairbridge Farm (D.Papenfus 696)			
Selena's Synaphea [82881]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Thelymitra stellata			
Star Sun-orchid [7060]	Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Natator depressus			
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
SHARK			
Carcharias taurus (west coast population)			
Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pristis pristis			
Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Sphyrna lewini](#) Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species

[Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
[Anous stolidus](#) Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
[Ardenna carneipes](#) Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
[Ardenna grisea](#) Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
[Diomedea amsterdamensis](#) Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In feature area
[Diomedea epomophora](#) Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
[Diomedea exulans](#) Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Hydroprogne caspia](#) Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In feature area
[Macronectes giganteus](#) Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Onychoprion anaethetus Bridled Tern [82845]		Breeding known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons Little Tern [82849]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In feature area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In feature area
Carcharias taurus Grey Nurse Shark [64469]		Species or species habitat likely to occur within area	In feature area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Mobula alfredi as Manta alfredi](#) Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In feature area
[Mobula birostris as Manta birostris](#) Giant Manta Ray [90034]		Species or species habitat may occur within area	In feature area
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
[Pristis pristis](#) Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
[Rhincodon typus](#) Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Terrestrial Species			
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
[Arenaria interpres](#) Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Calidris alba](#) Sanderling [875]		Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area	In buffer area only
Calidris tenuirostris Great Knot [862]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Numenius phaeopus](#) Whimbrel [849]		Species or species habitat known to occur within area	In buffer area only
[Pandion haliaetus](#) Osprey [952]		Breeding known to occur within area	In feature area
[Phalaropus lobatus](#) Red-necked Phalarope [838]		Species or species habitat known to occur within area	In buffer area only
[Pluvialis fulva](#) Pacific Golden Plover [25545]		Species or species habitat known to occur within area	In buffer area only
[Pluvialis squatarola](#) Grey Plover [865]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
[Tringa brevipes](#) Grey-tailed Tattler [851]		Species or species habitat known to occur within area	In buffer area only
[Tringa glareola](#) Wood Sandpiper [829]		Species or species habitat known to occur within area	In buffer area only
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
[Tringa stagnatilis](#) Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area	In buffer area only
[Tringa totanus](#) Common Redshank, Redshank [835]		Species or species habitat known to occur within area	In buffer area only
[Xenus cinereus](#) Terek Sandpiper [59300]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

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

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - CAMPBELL BARRACKS - SWANBOURNE [50183]	WA	In buffer area only
Defence - CAMPBELL BARRACKS - SWANBOURNE [50182]	WA	In buffer area only
Defence - CAMPBELL BARRACKS - SWANBOURNE [50185]	WA	In buffer area only
Defence - CAMPBELL BARRACKS - SWANBOURNE [50186]	WA	In buffer area only
Defence - CAMPBELL BARRACKS - SWANBOURNE [50187]	WA	In buffer area only
Defence - CAMPBELL BARRACKS - SWANBOURNE [50181]	WA	In buffer area only
Defence - CAMPBELL BARRACKS - SWANBOURNE [50184]	WA	In buffer area only
Defence - IRWIN BARRACKS - KARRAKATTA [50175]	WA	In buffer area only
Defence - SWANBOURNE RIFLE RANGE [50189]	WA	In buffer area only
Defence - SWANBOURNE RIFLE RANGE [50188]	WA	In buffer area only
Defence - SWANBOURNE RIFLE RANGE [50191]	WA	In buffer area only
Defence - SWANBOURNE RIFLE RANGE [50190]	WA	In buffer area only
Unknown		
Commonwealth Land - [50748]	WA	In buffer area only
Commonwealth Land - [50746]	WA	In buffer area only
Commonwealth Land - [50675]	WA	In buffer area only
Commonwealth Land - [50674]	WA	In buffer area only
Commonwealth Land - [50679]	WA	In buffer area only
Commonwealth Land - [50673]	WA	In buffer area only
Commonwealth Land - [51422]	WA	In buffer area only
Commonwealth Land - [50678]	WA	In buffer area only
Commonwealth Land - [50724]	WA	In buffer area only
Commonwealth Land - [50726]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50727]	WA	In buffer area only
Commonwealth Land - [50720]	WA	In buffer area only
Commonwealth Land - [50641]	WA	In buffer area only
Commonwealth Land - [50728]	WA	In buffer area only
Commonwealth Land - [50660]	WA	In buffer area only
Commonwealth Land - [50723]	WA	In buffer area only
Commonwealth Land - [50650]	WA	In buffer area only
Commonwealth Land - [51419]	WA	In buffer area only
Commonwealth Land - [50664]	WA	In buffer area only
Commonwealth Land - [51418]	WA	In buffer area only
Commonwealth Land - [50665]	WA	In buffer area only
Commonwealth Land - [50739]	WA	In buffer area only
Commonwealth Land - [50738]	WA	In buffer area only
Commonwealth Land - [51411]	WA	In buffer area only
Commonwealth Land - [51892]	WA	In buffer area only
Commonwealth Land - [51898]	WA	In buffer area only
Commonwealth Land - [51891]	WA	In buffer area only
Commonwealth Land - [51893]	WA	In buffer area only
Commonwealth Land - [50702]	WA	In buffer area only
Commonwealth Land - [50693]	WA	In buffer area only
Commonwealth Land - [50692]	WA	In buffer area only
Commonwealth Land - [50649]	WA	In buffer area only
Commonwealth Land - [50691]	WA	In buffer area only
Commonwealth Land - [50648]	WA	In buffer area only
Commonwealth Land - [51420]	WA	In buffer area only
Commonwealth Land - [50663]	WA	In buffer area only
Commonwealth Land - [51134]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51132]	WA	In buffer area only
Commonwealth Land - [51133]	WA	In buffer area only
Commonwealth Land - [50703]	WA	In buffer area only
Commonwealth Land - [50700]	WA	In buffer area only
Commonwealth Land - [50701]	WA	In buffer area only
Commonwealth Land - [50706]	WA	In buffer area only
Commonwealth Land - [50704]	WA	In buffer area only
Commonwealth Land - [50705]	WA	In buffer area only
Commonwealth Land - [50689]	WA	In buffer area only
Commonwealth Land - [50715]	WA	In buffer area only
Commonwealth Land - [51129]	WA	In buffer area only
Commonwealth Land - [50714]	WA	In buffer area only
Commonwealth Land - [51127]	WA	In buffer area only
Commonwealth Land - [50630]	WA	In buffer area only
Commonwealth Land - [50694]	WA	In buffer area only
Commonwealth Land - [50695]	WA	In buffer area only
Commonwealth Land - [50696]	WA	In buffer area only
Commonwealth Land - [50697]	WA	In buffer area only
Commonwealth Land - [50698]	WA	In buffer area only
Commonwealth Land - [50699]	WA	In buffer area only
Commonwealth Land - [51124]	WA	In buffer area only
Commonwealth Land - [51119]	WA	In buffer area only
Commonwealth Land - [51974]	WA	In buffer area only
Commonwealth Land - [51978]	WA	In buffer area only
Commonwealth Land - [50752]	WA	In buffer area only
Commonwealth Land - [50753]	WA	In buffer area only
Commonwealth Land - [51491]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50757]	WA	In buffer area only
Commonwealth Land - [51987]	WA	In buffer area only
Commonwealth Land - [51439]	WA	In buffer area only
Commonwealth Land - [51437]	WA	In buffer area only
Commonwealth Land - [50680]	WA	In buffer area only
Commonwealth Land - [50625]	WA	In buffer area only
Commonwealth Land - [50626]	WA	In buffer area only
Commonwealth Land - [50717]	WA	In buffer area only
Commonwealth Land - [50713]	WA	In buffer area only
Commonwealth Land - [50716]	WA	In buffer area only
Commonwealth Land - [50719]	WA	In buffer area only
Commonwealth Land - [50712]	WA	In buffer area only
Commonwealth Land - [50718]	WA	In buffer area only

Commonwealth Heritage Places [Resource Information]

Name	State	Status	Buffer Status
Historic			
Army Magazine Buildings Irwin Barracks	WA	Listed place	In buffer area only
Claremont Post Office	WA	Listed place	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus			
Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Anous tenuirostris melanops			
Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus			
Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Arenaria interpres			
Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris alba			
Sanderling [875]		Species or species habitat known to occur within area	In buffer area only
Calidris canutus			
Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Calidris tenuirostris Great Knot [862]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area	In buffer area only
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In feature area
Larus pacificus Pacific Gull [811]		Foraging, feeding or related behaviour may occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area overfly marine area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
[Numenius phaeopus](#) Whimbrel [849]		Species or species habitat known to occur within area	In buffer area only
[Onychoprion anaethetus as Sterna anaethetus](#) Bridled Tern [82845]		Breeding known to occur within area	In feature area
[Pachyptila turtur](#) Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
[Pandion haliaetus](#) Osprey [952]		Breeding known to occur within area	In feature area
[Phalaropus lobatus](#) Red-necked Phalarope [838]		Species or species habitat known to occur within area	In buffer area only
[Phoebetria fusca](#) Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
[Pluvialis fulva](#) Pacific Golden Plover [25545]		Species or species habitat known to occur within area	In buffer area only
[Pluvialis squatarola](#) Grey Plover [865]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In buffer area only
[Pterodroma mollis](#) Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Puffinus assimilis](#) Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thinornis cucullatus as Thinornis rubricollis			
Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa brevipes as Heteroscelus brevipes			
Grey-tailed Tattler [851]		Species or species habitat known to occur within area	In buffer area only
Tringa glareola			
Wood Sandpiper [829]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis			
Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa totanus			
Common Redshank, Redshank [835]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Xenus cinereus			
Terek Sandpiper [59300]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In buffer area only
Fish			
Acentronura australe			
Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In feature area
Campichthys galei			
Gale's Pipefish [66191]		Species or species habitat may occur within area	In feature area
Choeroichthys suillus			
Pig-snouted Pipefish [66198]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area	In feature area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In buffer area only
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area	In feature area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In feature area
Hippocampus subelongatus West Australian Seahorse [66722]		Species or species habitat may occur within area	In feature area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area	In buffer area only
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In buffer area only
Lissocampus fatiloquus Prophet's Pipefish [66250]		Species or species habitat may occur within area	In feature area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area
Mitotichthys meraculus Western Crested Pipefish [66259]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area	In feature area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In feature area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In feature area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In feature area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In feature area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In feature area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In feature area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In feature area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Vanacampus poecilolaemus](#) Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area	In buffer area only
Mammal			
[Arctocephalus forsteri](#) Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In feature area
[Neophoca cinerea](#) Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat likely to occur within area	In feature area
Reptile			
[Aipysurus pooleorum](#) Shark Bay Sea Snake [66061]		Species or species habitat may occur within area	In feature area
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
[Hydrophis kingii as Disteira kingii](#) Spectacled Sea Snake [93511]		Species or species habitat may occur within area	In feature area
[Hydrophis platura as Pelamis platurus](#) Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area	In feature area
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Whales and Other Cetaceans			[Resource Information]

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

Current Scientific Name	Status	Type of Presence	Buffer Status
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Bold Park	Botanic Gardens	WA	In buffer area only
Kings Park	Botanic Gardens	WA	In buffer area only
Marmion	Marine Park	WA	In buffer area only
Swan River	Management Area	WA	In buffer area only
Unnamed WA31906	Nature Reserve	WA	In buffer area only
Unnamed WA45772	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA45773	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA46756	Conservation Park	WA	In buffer area only
Unnamed WA46926	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA50067	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA50514	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA52237	5(1)(h) Reserve	WA	In buffer area only
Woodvale	5(1)(h) Reserve	WA	In buffer area only

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Herdsman Lake	WA	In buffer area only
Palmer Barracks, Guildford	WA	In buffer area only
Swan-Canning Estuary	WA	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Hale School Development	2022/09273		Completed	In buffer area only
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia West	2024/09826		Completed	In buffer area only
Outer Harbour Port Development, Kwinana	2024/09859		Assessment	In buffer area only
Residential Development, Woodvale	2024/10047		Referral Decision	In buffer area only
SMAP telecommunications submarine cable installation	2024/09989		Completed	In buffer area only
Controlled action				
Erindale Road Development, Hamersley, WA	2018/8324	Controlled Action	Further Information Request	In buffer area only
Mitchell Freeway Principal Shared Path Gaps Project Ocean Reef Road to Hepburn Avenue	2020/8833	Controlled Action	Post-Approval	In buffer area only
Nava-1 Cable System	2001/510	Controlled Action	Completed	In buffer area only
Residential Development at Shenton Park	2007/3386	Controlled Action	Completed	In buffer area only
Shark Hazard Mitigation Drum Line Program, WA	2014/7174	Controlled Action	Completed	In feature area
Shenton Park Subdivision	2004/1479	Controlled Action	Completed	In feature area
Not controlled action				
APX-West Fibre-optic telecommunications cable system, WA to Singapore	2013/7102	Not Controlled Action	Completed	In buffer area only
Bold Park St John's Wood Mt Claremont residential development,Claremont WA	2014/7248	Not Controlled Action	Completed	In buffer area only
Cottesloe Golf Course safety improvements, Swanbourne, WA	2019/8423	Not Controlled Action	Completed	In buffer area only
Development Application 20 Kenhelm St Balcatta WA	2021/9037	Not Controlled Action	Completed	In buffer area only
Development of a Diagnostic Laboratory	2011/6089	Not Controlled Action	Completed	In buffer area only
Development of Existing Lots 9970 & 10754, Bedbrook Pl, Shenton Park, WA	2013/7033	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Fremantle Ports Inner Harbour Capital Dredging Proposal	2005/2477	Not Controlled Action	Completed	In buffer area only
Groundwater Replenishment Scheme (GWRS) Stage 2	2016/7786	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In buffer area only
INDIGO West Submarine Telecommunications Cable, WA	2017/8126	Not Controlled Action	Completed	In buffer area only
Oman Australia Cable Installation, WA	2021/8922	Not Controlled Action	Completed	In buffer area only
Oman Australia Cable - Marine Route Survey	2020/8731	Not Controlled Action	Completed	In buffer area only
Reid Highway duplication project(Erindale Rd - Duffy Rd)WA	2013/7073	Not Controlled Action	Completed	In buffer area only
Residential development, Lot 14143 (16) Harford Way, Girrawheen, WA	2016/7819	Not Controlled Action	Completed	In buffer area only
Seismic Survey, Bremer Basin, Mentelle Basin and Zeewyck Sub-basin	2004/1700	Not Controlled Action	Completed	In feature area
Shenton Park Rehabilitation Hospital Redevelopment, Shenton Park, WA	2015/7622	Not Controlled Action	Completed	In buffer area only
Shenton Park Zone Substation Conversion and Expansion	2012/6354	Not Controlled Action	Completed	In buffer area only
Urban Development Project, Lot 55 and 56 Cottonwood Crescent, Dianella, WA	2017/8031	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Australia to Singapore Fibre Optic Submarine Cable System	2011/6127	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Laying a submarine optical fibre telecommunications cable, Perth to Singapore and Jakarta	2014/7332	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
South West Metropolitan Railway Project	2003/1175	Not Controlled Action (Particular	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
		Manner)		

Key Ecological Features [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region	Buffer Status
Commonwealth marine environment within and adjacent to the west coast inshore lagoons	South-west	In buffer area only
Western rock lobster	South-west	In buffer area only

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna pacifica			
Wedge-tailed Shearwater [84292]	Foraging (in high numbers)	Known to occur	In feature area
Eudyptula minor			
Little Penguin [1085]	Foraging (provisioning young)	Known to occur	In buffer area only
Hydroprogne caspia			
Caspian Tern [808]	Foraging (provisioning young)	Known to occur	In feature area
Larus pacificus			
Pacific Gull [811]	Foraging (in high numbers)	Former Range	In feature area
Onychoprion anaethetus			
Bridled Tern [82845]	Foraging (in high numbers)	Known to occur	In feature area
Puffinus assimilis tunneyi			
Little Shearwater [59363]	Foraging (in high numbers)	Known to occur	In feature area
Sterna dougallii			
Roseate Tern [817]	Foraging	Known to occur	In feature area
Sternula nereis			
Fairy Tern [82949]	Foraging (in high numbers)	Known to occur	In feature area

Scientific Name	Behaviour	Presence	Buffer Status
Seals			
Neophoca cinerea Australian Sea Lion [22]	Foraging (male)	Likely to occur	In feature area
Whales			
Megaptera novaeangliae Humpback Whale [38]	Migration (north)	Known to occur	In buffer area only
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	Known to occur	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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

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

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

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

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Appendix 2: Conservation Codes

A2.1 Flora and Fauna

State Flora and Fauna Conservation Codes under the *Biodiversity Conservation Act 2018* (WA)

Conservation Code	Name	Description
Threatened Species		
CR	Critically endangered	Species considered to be facing an extremely high risk of extinction within the wild in the immediate future
EN	Endangered	Species considered to be facing a very high risk of extinction in the wild in the near future
VU	Vulnerable	Species considered to be facing a high risk of extinction in the wild in the medium-term future
Extinct Species		
EX	Extinct Species	Species where 'there is no reasonable doubt that the last member of the species has died (Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice or the Wildlife Conservation (Rare Flora) Notice)
EW	Extinct in the Wild	Species that are known to only survive in cultivation, in captivity, or as a naturalised population well outside its past range; and it has not been recorded in its known or expected habitat at appropriate seasons anywhere in its past range, despite surveys over a timeframe appropriate to its life cycle and form
Specially Protected Species		
MI	Migratory Species	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth (Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice)
CD	Conservation Dependent	Species of special conservation interest (conservation dependent fauna), being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened (Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice)
OS	Other Specially Protected Species	Fauna otherwise in need of special protection to ensure their conservation (Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice)

State Flora and Fauna Conservation Codes listed by Department of Biodiversity, Conservation and Attractions

Conservation Code	Name	Description
P1	Priority One	Poorly known species – Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either very small or on lands not managed for conservation, such as road verges, urban areas, farmland, active mineral lease and under threat of habitat destruction or degradation.
P2	Priority Two	Poorly known species – Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, such as national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves and similar.
P3	Priority Three	Poorly known species – Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat
P4	Priority Four	Rare or near threatened and other species in need of monitoring. a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as a conservation dependent specially protected species. c) Species that have been removed from the list of threatened species or lists of conservation dependent or other specially protected species, during the past five years for reasons other than taxonomy.

Source: DBCA, 2023

Commonwealth Flora and Fauna Conservation Codes under the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth)

Category	Description
Extinct	A native species which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
Extinct in the wild	A native species which at a particular time if, at that time: a) It is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or b) It 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	A species considered to be facing an extremely high risk of extinction in the wild and is determined that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations.
Endangered	A species considered to be facing a very high risk of extinction in the wild and is determined that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations.
Vulnerable	A species considered to be facing a high risk of extinction in the wild and is determined that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations.
Conservation dependent	A native species which at a particular time if, at that time: a) is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or b) the following subparagraphs are satisfied: i. the species is a species of fish; ii. the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised; iii. the plan of management is in force under a law of the Commonwealth or of a State or Territory; iv. cessation of the plan of management would adversely affect the conservation status of the species

A2.2 Ecological Communities

State Ecological Community Conservation Codes under the *Biodiversity Conservation Act 2018* (WA)

Conservation Code	Name	Description
PD	Presumed Totally Destroyed	An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future
CR	Critically Endangered	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.
EN	Endangered	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future
VU	Vulnerable	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

State Ecological Community Conservation Codes listed by Department of Biodiversity, Conservation and Attractions

Conservation Code	Name	Description
P1	Priority One	**Poorly known ecological communities - very few occurrences, very restricted distribution** Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤100 ha). Occurrences are believed to be under threat either due to limited extent or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range
P2	Priority Two	**Poorly known ecological communities - few occurrences, restricted distribution** Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200 ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
P3	Priority Three	**Poorly known ecological communities - inadequately surveyed or not well defined** Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them. his category includes three sub-categories: i. Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation. ii. Communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), iii. Communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across

Conservation Code	Name	Description
		much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.
P4	Priority Four	**Adequately known ecological communities - rare, near threatened, or recently removed from the threatened list** Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring. i. Rare: Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These communities are usually represented on conservation lands. ii. Near Threatened: Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category. iii. Ecological communities that have been removed from the list of threatened communities during the past five years.
P5	Priority Five	**Conservation dependent ecological communities** Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Source: DBCA, 2023

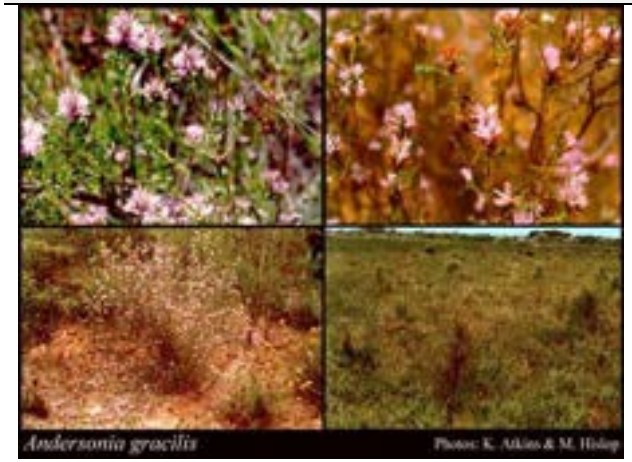
Commonwealth Ecological Community Conservation Codes under the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth)

Category	Description
Critically endangered	If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).
Endangered	If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).
Vulnerable	If, at that time, an ecological community is not critically endangered or endangered but is facing a high risk of extinction in the wild in the medium-term future (indicative timeframe being the next 50 years).

Appendix 3: Significant Species

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
 *Acacia benthamii*	Bentham's Wattle	Shrub, ca 1 m high. Fl. yellow,	Aug to Sep.	Sand. Typically on limestone breakaways.	P2	N	Habitat unsuitable
Amanita brunneola		No Info	N/A		P2	N	Habitat unsuitable

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
 *Amanita carneiphylla*		Pastel pink gills (near Methuen 8A2 to 9A2) which dull (near Methuen 9B2) but remain pink in old age; (ii) Finely striate pendulous persistent superior annulus; (iv) Multiple belts of membranous tissue on lower stem; (iv) Fleshy solid pale pink flesh unchanging when cut or bruised; (v) Fusoid, rooting stem; (vi) conical to blunt white warts (up to 2mm tall) crowded on cap.	N/A	Deeply rooting in sandy soil, solitary or in small scattered groups	P3	N	Habitat unsuitable
Amanita preissii	Cinnamon-ring Lepidella	No Info	N/A		P3	N	Habitat unsuitable

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
 *Andersonia gracilis*		Slender erect or open straggly shrub, 0.1-0.5(-1) m high. Fl. white-pink-purple.	Sep to Nov.	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	T/VU	N	Habitat unsuitable
 *Anigozanthos viridis* subsp. *terraspectans*	Dwarf Green Kangaroo Paw	Rhizomatous, perennial, herb, 0.05-0.2 m high. Fl. green/yellow-green	Aug to Sep.	Grey sand, clay loam. Winter-wet depressions.	T/VU	N	Habitat unsuitable
Austrostipa mundula					P3	N	Habitat unsuitable

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)					P1	N	Habitat unsuitable
 *Banksia mimica*	Summer Honeypot	Prostrate, lignotuberous shrub, 0.15-0.4 m high. Fl. yellow-brown.	Dec or Jan to Feb.	White or grey sand over laterite, sandy loam.	T/VU	N	Habitat unsuitable
 *Beyeria cinerea* subsp*. cinerea*					P3	Y	Habitat suitable

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
 *Caladenia huegelii*	Grand Spider Orchid	Tuberous, perennial, herb, 0.25-0.6 m high. Fl. green & cream & red.	Sep to Oct.	Grey or brown sand, clay loam.	T/CR	N	Habitat unsuitable
 *Calothamnus graniticus* subsp*. leptophyllus*		Erect, multi-stemmed shrub, 1-2 m high. Fl. red	Jun to Aug.	Clay over granite, lateritic soils. Hillsides.	P4	N	Habitat unsuitable

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
 *Calothamnus macrocarpus*		Erect shrub, 0.4-2(-3) m high. Fl. red	Feb or Apr or Aug to Dec.	Rocky quartzite soils, sand. Slopes.	P2	N	Habitat unsuitable
Conostylis bracteata		Rhizomatous, tufted or shortly proliferous perennial, grass-like or herb, 0.2-0.45 m high. Fl. yellow,	Aug to Sep.	Sand, limestone. Consolidated sand dunes.	P3	Y	Habitat suitable

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
 *Diuris drummondii*	Tall Donkey Orchid	Tuberous, perennial, herb, 0.5-1.05 m high. Fl. Yellow.	Nov to Dec or Jan.	Low-lying depressions, swamps.	T/EN	N	Habitat unsuitable
 *Diuris micrantha*	Dwarf Bee Orchid	Tuberous, perennial, herb, 0.3-0.6 m high. Fl. yellow & brown.	Sep to Oct.	Brown loamy clay. Winter-wet swamps, in shallow water.	T/VU	N	Habitat unsuitable

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
 *Diuris purdiei*	Purdie's Donkey Orchid	Tuberous, perennial, herb, 0.15-0.35 m high. Fl. Yellow.	Sep to Oct.	Grey-black sand, moist. Winter-wet swamps.	T/EN	N	Habitat unsuitable
 *Dodonaea hackettiana*	Hackett's Hopbush	Erect shrub or tree, 1-5 m high. Fl. yellow-green/red, mainly.	Jul to Oct.	Sand. Outcropping limestone.	P4	N	Habitat unsuitable

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
 *Drakaea elastica*	Glossy-leaved Hammer Orchid	Tuberous, perennial, herb, 0.12-0.3 m high. Fl. red & green & yellow.	Oct to Nov.	White or grey sand. Low-lying situations adjoining winter-wet swamps.	T/CR	N	Habitat unsuitable
 *Drakaea micrantha*		Tuberous, perennial, herb, 0.15-0.3 m high. Fl. red & yellow.	Sep to Oct.	White-grey sand.	T/EN	N	Habitat unsuitable

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
 *Eleocharis keigheryi*		Rhizomatous, clumped perennial, grass-like or herb (sedge), to 0.4 m high. Fl. Green.	Aug to Nov.	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	T/VU	N	Habitat unsuitable
 *Eucalyptus argutifolia*	Wabling Hill Mallee	(Mallee), 1.5-4 m high, bark smooth. Fl. white	Mar to Apr.	Shallow soils over limestone. Slopes or gullies of limestone ridges, outcrops.	T/VU	N	Habitat unsuitable

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
Eucalyptus foecunda subsp. *foecunda*	Fremantle Mallee	Dense emergent mallee. Bark +/- smooth; buds golden.	-	Sand over limestone.	P4	N	Habitat unsuitable
Fabronia hampeana		No Info			P2	N	Habitat unsuitable
Hibbertia leptotheca		No Info			P3	N	Habitat unsuitable
 *Jacksonia sericea*	Waldjumi	Low spreading shrub, to 0.6 m high. Fl. orange,	Usually Dec or Jan to Feb.	Calcareous & sandy soils.	P4	N	Habitat unsuitable
Lasiopetalum membranaceum		Multi-stemmed shrub, 0.2-1 m high. Fl. pink-blue-purple.	Sep to Dec.	Sand over limestone.	P3	N	Habitat unsuitable
Lepidium pseudohyssopifolium		Erect annual or perennial, herb, to 0.4(-0.6) m high.	Jun to Sep	Swampy ground.	P1	N	Habitat unsuitable

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
 *Macarthuria keigheryi*		Erect or spreading perennial, herb or shrub, 0.2-0.4 m high, 0.3-0.6 m wide.	Sep to Dec or Feb to Mar.	White or grey sand.	T/EN	N	Habitat unsuitable
 *Pimelea calcicola*	Coastal Banjine	Erect to spreading shrub, 0.2-1 m high. Fl. Pink.	Sep to Nov.	Sand. Coastal limestone ridges.	P3	N	Habitat unsuitable

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
 *Stylidium maritimum*	Coastal Triggerplant	Caespitose perennial, herb, 0.3-0.7 m high, Leaves tufted, linear to narrowly oblanceolate, 10-40 cm long, 1-5.5 mm wide, apex acute to mucronate, margin involute, glabrous. Membraneous scale leaves present at base of mature leaves. Scape glandular throughout. Inflorescence paniculate. Fl. white/purple.	Sep to Nov.	Sand over limestone. Dune slopes and flats. Coastal heath and shrubland, open Banksia woodland.	P3	Y	Habitat suitable
 *Synaphea* sp. Fairbridge Farm (D.Papenfus 696)		Dense, clumped shrub, to 0.3 m high, to 0.4 m wide. Fl. yellow	Oct.	Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses.	T/CR	N	Habitat unsuitable

Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N	Comment
 *Thelymitra stellata*	Star Orchid	Tuberous, perennial, herb, 0.15-0.25 m high. Fl. yellow & brown.	Oct to Nov.	Sand, gravel, lateritic loam.	T/EN	N	Habitat unsuitable

Appendix 4: Flora Species List

The complete flora list for the site is provided in the table below with flora listed by family. *Denotes introduced species.

Family	Species	Common Name
Aizoaceae	**Tetragonia decumbens*	Sea Spinach
Aizoaceae	*Carpobrotus virescens*	Coastal Pigface
Asparagaceae	*Acanthocarpus preissii*	
Asparagaceae	*Lomandra maritima*	Maritime Mat Rush
Asphodelaceae	**Asphodelus fistulosus*	Onion Weed
Asphodelaceae	**Trachyandra divaricata*	
Asteraceae	**Erigeron bonariensis*	
Asteraceae	**Gazania linearis*	
Asteraceae	*Leucophyta brownii*	
Asteraceae	*Olearia axillaris*	Coastal Daisybush
Asteraceae	*Pithocarpa cordata*	Tangle Daisy
Brassicaceae	**Cakile maritima*	Sea Rocket
Brassicaceae	**Lobularia maritima*	Sweet Alyssum
Chenopodiaceae	*Atriplex isatidea*	Coast Saltbush
Chenopodiaceae	*Rhagodia baccata*	Berry Saltbush
Chenopodiaceae	*Threlkeldia diffusa*	Coast Bonefruit
Crassulaceae	**Aeonium arboreum*	
Crassulaceae	**Crassula glomerata*	
Cupressaceae	*Callitris preissii*	Rottnest Island Pine
Cyperaceae	*Ficinia nodosa*	Knotted Club Rush
Cyperaceae	*Lepidosperma gladiatum*	
Ericaceae	*Leucopogon parviflorus*	Coast Beard-heath
Euphorbiaceae	**Euphorbia maculata*	
Euphorbiaceae	**Euphorbia terracina*	Geraldton Carnation Weed
Fabaceae	**Lupinus* sp.	
Fabaceae	*Acacia cochlearis*	Rigid Wattle
Fabaceae	*Acacia cyclops*	
Fabaceae	*Acacia lasiocarpa*	Panjang

Family	Species	Common Name
Fabaceae	*Acacia rostellifera*	Summer-scented Wattle
Fabaceae	*Hardenbergia comptoniana*	Native Wisteria
Fabaceae	*Kennedia prostrata*	Scarlet Runner
Geraniaceae	**Pelargonium capitatum*	Rose Pelargonium
Geraniaceae	*Geranium molle*	Dove's Foot Cranesbill
Goodeniaceae	*Scaevola anchusifolia*	Silky Scaevola
Goodeniaceae	*Scaevola canescens*	Grey Scaevola
Goodeniaceae	*Scaevola crassifolia*	Thick-leaved Fan-flower
Haemodoraceae	*Conostylis candicans*	Grey Cottonhead
Iridaceae	**Romulea rosea*	Guildford Grass
Lamiaceae	*Hemiandra pungens*	Snakebush
Lauraceae	*Cassytha flava*	Dodder Laurel
Lauraceae	*Cassytha racemosa*	Dodder Laurel
Myrtaceae	*Agonis flexuosa*	Peppermint
Myrtaceae	*Eucalyptus gomphocephala*	Tuart
Myrtaceae	*Melaleuca huegelii*	Chenille Honeymyrtle
Myrtaceae	*Melaleuca lanceolata*	Rottnest Teatree
Myrtaceae	*Melaleuca systena*	Coastal Honeymyrtle
Nitrariaceae	*Nitraria billardierei*	Nitre Bush
Olacaceae	*Olax benthamiana*	
Onagraceae	**Oenothera drummondii*	Beach Evening Primrose
Oxalidaceae	**Oxalis pes-caprae*	Soursob
Poaceae	**Ammophila arenaria*	Marram Grass
Poaceae	**Avena barbata*	Bearded Oat
Poaceae	**Bromus diandrus*	Great Brome
Poaceae	**Ehrharta longiflora*	Annual Veldt Grass
Poaceae	**Lagurus ovatus*	Hare's Tail Grass
Poaceae	**Lolium rigidum*	Wimmera Ryegrass
Poaceae	**Thinopyrum distichum*	
Poaceae	*Hordeum leporinum*	Barley Grass
Poaceae	*Spinifex hirsutus*	Hairy Spinifex
Poaceae	*Spinifex longifolius*	Beach Spinifex

Family	Species	Common Name
Proteaceae	*Grevillea crithmifolia*	
Ranunculaceae	*Clematis linearifolia*	Slender Clematis
Rhamnaceae	*Spyridium globulosum*	Basket Bush
Santalaceae	*Exocarpos sparteus*	Broom Ballart
Santalaceae	*Santalum acuminatum*	Quandong
Scrophulariaceae	**Dischisma arenarium*	
Scrophulariaceae	*Myoporum insulare*	Blueberry Tree