UDLA

Trigg to Scarborough Dune System Environmental Survey

Spring 2025

Natural Area Holdings Pty Ltd
Whadjuk Country
57 Boulder Road, Malaga WA 6090
Ph: (08) 9209 2767
info@naturalarea.com.au
www.naturalarea.com.au



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

Natural Area Holdings Pty Ltd, trading as Natural Area Consulting Management Services (Natural Area), has prepared this report for the sole use of the Client and for the purposes as stated in the agreement between the Client and Natural Area under which this work was completed. This report may not be relied upon by any other party without the express written agreement of Natural Area. No part of this document may be copied, duplicated, or disclosed without the express written permission of the Client and Natural Area.

Natural Area has exercised due and customary care in the preparation of this document and has not, unless specifically stated, independently verified information provided by others. No other warranty, expressed or implied, is made in relation to the contents of this report. Therefore, Natural Area assumes no liability for any loss resulting from errors, omission or misrepresentations made by others. This document has been made at the request of the Client. The use of this document by unauthorised third parties without written permission from Natural Area shall be at their own risk, and we accept no duty of care to any such third party.

Any recommendations, opinions or findings stated in this report are based on circumstances and facts as they existed at the time Natural Area performed the work. Any changes in such circumstances and facts upon which this document is based may adversely affect any recommendations, opinions or findings contained in this document.

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 Flora and Fauna Survey Trigg
Location	UDLA/2025 09 180 Flora and Fauna Survey Trigg/6. Reporting/UDLA-R Flora and Fauna Survey Trigg.docx

Version	Date	Changes	Prepared by
Final Version	21/08/2026	-	Natural Area

Executive Summary

Natural Area Consulting Management Services (Natural Area) was contracted by UDLA to undertake a detailed flora and vegetation survey and a detailed fauna survey of a portion of Trigg Beach. The environmental survey of the site was undertaken by qualified environmental scientists in accordance with *Environmental Protection Authority (EPA) Technical Guidance - Flora and Vegetation Surveys* (2016) and *EPA Technical Guidance - Terrestrial Vertebrate Fauna Surveys* (2020). The results of the environmental surveys are to assist in determining environmental values on site, considerations for future enhancement of environmental values, and future development. The area between Trigg Beach and Scarborough has been identified by the City of Stirling as an area to improve connectivity; to enhance and protect the coastline, improve pedestrian safety, and enable visitors to take in the natural area.

The detailed flora and vegetation survey determined:

- A total of 116 flora species (taxa) were recorded from 40 families during the field survey, comprising of 67 introduced (weeds) and 49 native species.
- A total of four vegetation types were recorded within the site.
- Vegetation condition ranging from completely degraded to very good.
- The presence of one priority ecological community, FCT 29a: Coastal shrublands on shallow sands listed as Priority 3 by the Department of Biodiversity, Conservation and Attractions (DBCA).
- The presence of one threatened ecological community, FCT 30a: *Callitris preissii* and/or *Melaleuca lanceolata* forests and woodlands listed as Critically Endangered under the *Biodiversity Conservation Act 2016* (WA) (BC Act).

The detailed fauna survey determined:

- A total of 31 fauna species were recorded across the survey area comprised of 16 birds, 6 mammals and 9 reptiles.
- The presence of two declared pests were recorded within the site: Red Fox (**Vulpes vulpes*) and Rabbit (**Oryctolagus cuniculus*).
- One conservation significant fauna species, Caspian Tern (*Hydroprogne caspia*), listed as migratory under the BC Act and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- One main fauna habitat, mixed coastal shrubland, and three subgroups including beach front, open coastal shrubland and closed coastal shrubland.

The weed mapping assessment determined:

- A total of 67 introduced (weeds) species were recorded within the site from 24 families.
- The dominant weed family was Poaceae (grass) followed by Asteraceae (daisy) and Brassicaceae (mustard).
- No declared pests or Weeds of National Significance were recorded within the site.
- Combined weed densities were higher within the low-lying areas of the dunes and at drainage expel points.

Trigg Beach supports a diversity of native flora, contains a threatened ecological community, and provides fauna habitat for native fauna species. However, threats present within the site included a high weed diversity, along with declared fauna pests and inappropriate access. The vegetation in a degraded and

completely degraded condition on site should be rehabilitated to enhance and improve the existing site conditions; rehabilitation activities include weed control, revegetation and erosion control. Any proposed development within the site should follow the avoidance mitigation hierarchy, avoiding areas of native vegetation and the threatened ecological community occurrence. Any proposed developments should have an environmental management plan approved by relevant authorising agencies to mitigate the potential indirect impacts.

Contents

1.0 Introduction 7
1.1 Location 7
1.2 Scope 7
1.3 Legislative Context 8
1.3.1 Relevant Legislation 8
1.3.2 Relevant Planning and Policy 9
2.0 Site Characteristics 11
2.1 Regional Context 11
2.2 Climate 11
2.3 Topography and Soils 12
2.4 Vegetation Complex 12
2.5 Black Cockatoo Habitat 12
2.6 Hydrology 12
2.7 Ecological Linkage 13
2.8 Heritage Values 13
2.9 Coastal Erosion 13
3.0 Methodology 16
3.1 Desktop and Literature Review 16
3.2 Detailed Flora Survey 16
3.2.1 Targeted Flora Survey 18
3.2.2 Floristic Analysis 18
3.2.3 Limitations 18
3.3 Detailed Fauna Survey 21
3.3.1 Weather Conditions 21
3.3.2 Limitations 22
3.4 Weed Mapping 25
3.4.1 Limitations 25
4.0 Flora Results 26
4.1 Desktop Survey 26
4.1.1 Threatened and Priority Ecological Communities 27
4.2 Flora Survey Results 29

4.2.1 Flora 29
4.2.2 Vegetation Types 29
4.2.3 Vegetation Condition 33
4.2.4 Floristic Analysis 36
4.2.5 Threatened and Priority Communities 39
5.0 Fauna Results 41
5.1 Desktop Survey 41
5.2 Fauna Survey Results 44
5.2.1 Fauna 44
5.2.2 Fauna Habitat 47
6.0 Weed Mapping Results 50
7.0 Implications of Results 56
7.1 Flora and Vegetation 56
7.1.1 Threatened Ecological Communities 56
7.2 Fauna 58
7.3 Weed Mapping 59
7.3.1 Weed Prioritisation 59
7.3.2 Weed Management 59
8.0 Recommendations 62
9.0 References 64
Appendix 1: PMST Report 10 km 68
Appendix 2: Conservation Codes 106
A2.1 Flora and Fauna 106
A2.2 Ecological Communities 109
Appendix 3: Significant Species 112
Appendix 4: Species List 126
Appendix 5: Quadrat Data 130
Appendix 6: Floristic Analysis Data 150
Appendix 7: Declared Pest Legal Status and Control Categories 152
Appendix 8: Weed Species Prioritisation and Treatment 154
Appendix 9: Combined Weed Survey Species 158

1.0 Introduction

Natural Area Consulting Management Services (Natural Area) was contracted by UDLA to undertake a detailed flora and vegetation survey and a detailed fauna survey of a portion of Trigg Beach. The environmental survey of the site was undertaken by qualified environmental scientists in accordance with *Environmental Protection Authority (EPA) Technical Guidance - Flora and Vegetation Surveys* (2016) and *EPA Technical Guidance - Terrestrial Vertebrate Fauna Surveys* (2020). The results of the environmental surveys are to assist in determining environmental values on site, considerations for future enhancement of environmental values, and future development. The area between Trigg Beach and Scarborough has been identified by the City of Stirling as an area to improve connectivity; to enhance and protect the coastline, improve pedestrian safety, and enable visitors to take in the natural area.

1.1 Location

The survey 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 Highway to the east and Scarborough Beach foreshore to the south (Figure 1).

The survey 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 survey area intersects with the Bush Forever Site; Trigg Bushland and Adjacent Coastal Reserve, Trigg/Scarborough (ID 308) (DPLH, 2019). 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 Scope

The scope of works for the project included:

- Conducting a detailed and targeted flora survey during peak flowering (spring: September to November 2025) in accordance with *Environmental Protection Authority (EPA) Technical Guidance – Flora and Vegetation Surveys* (2016).
- Verifying vegetation types and condition (using the Keighery scale) as outlined in the *City of Stirling Boardwalk Concept Study - Environmental Survey Autumn* (Natural Area, 2025).
- Identification and mapping of native and introduced flora, including threatened ecological communities.
- Utilising data collected throughout City *of Stirling Boardwalk Concept Study - Environmental Survey Autumn* to assist with the completion of a detailed fauna survey during spring (September to November 2025) in accordance with the *EPA Technical Guidance - Terrestrial Vertebrate Fauna Surveys* (2020).
- Assessment of habitat connectivity.
- Applying Stirling Natural Environment Coastcare five-class weed cover system (0-20 % to 81-100 %) and outline any variances and provide possible explanations in change in conditions.
- Identify dominant invasive species.
- Provide recommendations for impact mitigation, rehabilitation and other considerations.

1.3 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.

1.3.1 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.

***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.

***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.

***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 Act. 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.

***Heritage Act 2018* (WA)**

The *Heritage Act 2018* (WA) recognises the importance of and promotes understanding and appreciation of Western Australia's cultural heritage; and provides for the identification and documentation of places of cultural heritage significance and for the conservation, use, development and adaptation of such places.

***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).

1.3.2 Relevant Planning and Policy

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).

Australian Pest Animal Strategy

The Australian Pest Animal Strategy (Invasive Plants and Animals Committee, 2017) provides a national guidance on best practice vertebrate pest animal management in striving towards the national vision of protecting Australia's economy, environment and social wellbeing from the impact of pest animals it reaffirms agrees national pest management principles and sets national goals and priorities that will improve Australia's overall ability to prevent and respond to new pest animal incursions and manage the negative impact of established pest animals.

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.

Metropolitan Region Scheme (MRS)

The MRS defines the future use of land and provides the legal basis for planning in the Perth metropolitan area. The MRS defines areas into broad zones and reservations which is administered by the Western Australian Planning Commission.

State Planning Policy 2.8 - Bushland policy for the Perth Metropolitan Region

The State Planning Policy 2.8 provides a framework to protect and manage significant bushland within the Perth Metropolitan Region. The policy aims to ensure that bushland protection and management are appropriately addressed and integrated with broader land use planning and decision making, seeking to balance environmental, social and economic considerations.



Figure 1:
Survey Area and Bush Forever Area

Trigg Beach, City of Stirling

Legend

- Bush Forever (ID 308)
- Survey Area

Client:	UDLA
Date:	17/02/2026
Created by:	Natural Area
Image Source:	Nearmap, 2026
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

2.0 Site Characteristics

2.1 Regional Context

The site is located within the Swan Coastal Plain (SWA02) Interim Biogeographic Regionalisation for Australia (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 Bureau of Meteorology (BoM) weather station to the site is Swanbourne (site number 009215) located approximately 8 km south of the survey area (BoM, 2026). The long-term average climate conditions recorded at this weather station between 1993 and 2025 are:

- Rainfall of 727 mm per annum, with majority of rainfall between May and September.
- Maximum temperature range of 18.4 °C in winter to 30.4 °C in summer.
- Minimum temperature ranging from 9.9 °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 2025 rainfall data. The rainfall recorded at weather station for Swanbourne recorded 899.2 mm for 2025, higher than the long-term average annual rainfall of 727 mm. Higher than average rainfall occurred in June, July, August, September and October of 2025 (Figure 2).

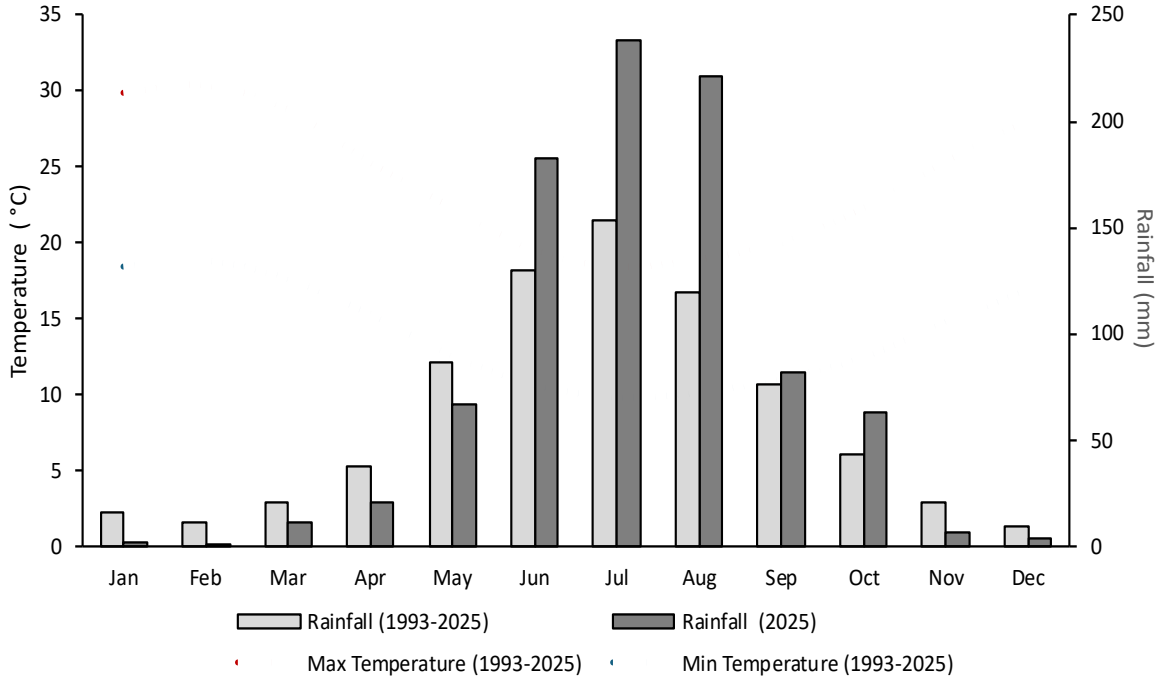


Figure 2: Temperature and rainfall data for Swanbourne site number 009215. Source: BoM, 2026.

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 identified within the 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:

- 56.83 % within the Swan Coastal Plain
- 24.23 % within the City of Stirling (Government of Western Australia, 2025).

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 Forest 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 (Landgate, 2025). No listed heritage values are recorded within the survey area.

2.9 Coastal Erosion

A Coastal Hazard Risk Management and Adaption Plan (CHRMAP) has been developed for the City of Stirling (Cardno, 2023a, 2023b, 2023c, 2023d, 2023e). The 2070 coastal erosion hazard zone is projected to extend approximately 50–75 m inland from the foredune edge with inundation not expected before 2122 (Cardno, 2023b).



Figure 3:

Topography and Soils

Trigg Beach, City of Stirling

Legend

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

Client:	UDLA
Date:	17/02/2026
Created by:	Natural Area
Image Source:	Nearmap, 2026
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N



Figure 4:

Groundwater Dependent Ecosystems

Trigg Beach, City of Stirling

Legend

Groundwater Dependent Ecosystems

- High potential
- Moderate potential
- Low potential
- Survey Area

Client:	UDLA
Date:	17/02/2026
Created by:	Natural Area
Image Source:	Nearmap, 2026
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

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
- previous environmental surveys, including:
    - *Trigg Bushland Reserve Management Plan* (Natural Area, 2015).
    - *Trigg Bushland Reserve Callitris preissii woodland Threatened Ecological Community Management Recommendations* (Natural Area, 2018).
    - *Re - Map of The City of Stirling Coastal Zone between South Trigg car park and north Scarborough car parks* (Fisher Research Pty Ltd, 2024)
    - *Preliminary Environmental Opportunities and Constraints Assessment* (Coterra Environment, 2024).
    - *City of Stirling Coastal Boardwalk Feasibility Study, Environmental Survey Autumn 2025* (Natural Area, 2025).

The following databases were accessed to obtain relevant information:

- NatureMap (DBCA, 2025a)
- Protected Matters Search Tool (PMST) (DCCEEW, 2025b) (Appendix 1)
- FloraBase (Western Australian 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 the on-ground flora survey which is provided in Appendix 3.

3.2 Detailed Flora Survey

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

Natural Area qualified environmental scientists undertook the survey between October 31 and November 4, 2025, with key data recorded using QField software on a handheld tablet. Survey activities included:

- Setting out a total of 12 10 x 10 m quadrats across the four vegetation types present (Figure 5).
- Photographing each quadrat in the north-west corner and recording GPS coordinates using GDA2020 Zone 50 datum.

- Recording landscape characteristics including soil types/colour, aspect, slope, surface rock, topography and drainage using Natural Area's modified recording sheets based on the NAIA templates developed for the Perth Biodiversity Project.
- Determining leaf litter depth, percentage cover, and percentage of bare ground.
- Recording percentage cover, height, number alive/dead stems and life form for each flora species in the quadrats.
- Marking locations of any conservation significant flora, declared pests and/or Weeds of National Significance (WoNS) 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). This includes the dominant growth form, height, cover and three dominant species for each stratum.
- Assessment of vegetation condition using the scale attributed to Keighery in *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment* (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.

3.2.1 Targeted Flora Survey

Natural Area qualified environmental scientists undertook the survey between October 31 and November 4, 2025, with key data recorded using QField software on a handheld tablet. Survey activities included:

- Traversing the entirety of the site at five metre intervals conducting a search for conservation significant flora species with the potential to occur in the area.
- Marking locations of any conservation significant flora using GPS and determining population size and extent.
- Recording evidence of disturbances that may impact conservation significant flora species.

3.2.2 Floristic Analysis

Floristic analysis was undertaken utilising the statistical analysis package PRIMER (version 7.0.24) to compare the data of the 12 quadrats recorded during the survey to the quadrat data from Gibson *et al*. (1994) and Keighery *et al*. (2012). To ensure that nomenclature and taxonomy is compatible, Gibson *et al*. (1994) and Keighery *et al*. (2012) data was reconciled to current species names. All quadrats used in the analysis was based on the presence-absence of flora species within a 10 x 10 metre quadrat. The surveyed quadrats were inserted into dataset and analysed using the Bray-Curtis distance clustering to determine overall quadrat groupings.

To ensure that the results of the grouping are consistent with the original finding of the Gibson *et a*l. (1994) and Keighery *et al*. (2012), a multivariate analysis of just their dataset was completed first to verify that the parameters set were accurate. Single site insertions of each quadrat were assessed to minimise the disruption to the original dataset. The similarity of the new quadrats to the closest quadrats were utilised to determine potential floristic community type (FCT) assignments. The potential FCT assignments for each quadrat were analysed against the habitat features including, key flora combinations and hydrological status of known FCTs to determine suitability.

3.2.3 Limitations

The limitations associated with the detailed and targeted flora survey undertaken within the site are outlined in Table 3 below.

Table 3: Limitations associated with the detailed and targeted flora survey

Potential Limitation	Degree of Limitation	Comments
Availability of contextual information	Minor	Regional contextual information was readily available for the Swan Coastal Plain. The area is under-represented in historic floristic studies, such as in Gibson *et al*. (1994) where it was noted to be under sampled during the study.
Competency/ experience of team	None	Survey activities were undertaken by qualified environmental scientists who have experience undertaking detailed and targeted flora surveys within the Swan Coastal Plain. The detailed and targeted flora survey was led by a qualified botanist with over five years of experience on the Swan Coastal Plain.
Proportion of flora recorded/ collected,	Minor	A total of 116 flora species (taxa) were recorded from 40 families during the field survey, comprised of 67 introduced (weeds) and

Potential Limitation	Degree of Limitation	Comments
any identification issues		49 native species. One species was unable to be identified to species level at the time of the survey due to the lack of identifiable features, this was recorded as a planted *Eucalyptus* species.
Survey effort and extent	None	The detailed flora survey was undertaken across four days by four qualified environmental scientists. The survey included traversing the site at 5 metre intervals and surveying 12, 10 x 10 metre quadrats across four vegetation types.
Access restrictions	Minor	Minor access restrictions were encountered within the survey area where health and safety concerns were present.
Survey timing	Minor	The survey was undertaken during spring which is the optimal season for flora surveys within the Swan Coastal Plain subregion. Whilst the survey was undertaken during flowering season, some species may flower earlier or later in the season and therefore may not be able to be identified. Of the three conservation significant flora species identified in the desktop survey as being likely to occur within the survey area, one has a flowering period outside of the survey period.
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.



Figure 5:
Quadrat Locations

Trigg Beach, City of Stirling

Legend
- Quadrat
- Tracklogs
- Survey Area

Client:	UDLA
Date:	17/02/2026
Created by:	Natural Area
Image Source:	Nearmap, 2026
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

3.3 Detailed Fauna Survey

The fauna survey was conducted in accordance with a detailed fauna survey as outlined in the *Technical Guidance, Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020). Natural Area qualified environmental scientists undertook the survey between October 31 and November 19, 2025, with survey activities including:

- Trapping over eight consecutive days (seven nights) with traplines and box traps (Table 4, Figure 6).
- Setting up six traplines which included pitfalls and funnel traps along a drift fence with vegetation used to cover funnel traps and placed in pitfall buckets to provide protection from the elements.
- Setting up 23 box traps with universal bait (oats and peanut butter), newspaper being placed inside for bedding and then traps were covered with a hessian bag or foliage to provide protection from the elements.
- All trap and trap line coordinates were recorded using a hand-held GPS and marked with flagging tape.
- Checking traps twice daily, within three hours of sunrise and after peak reptile activity as per DBCA licence conditions, along with recording and releasing captured species back into the site.
- Active searching included searching under logs, rocks and hand raking through leaf litter.
- Static bird census was undertaken during trapping events with five-minute census undertaken at each trap line location recording visual observations of birds and calls heard.
- Setting out three motion activated trail cameras for 14 nights in high-activity areas to capture images of evasive/trap-shy animals.
- Deployment of one passive acoustic recorder for 14 nights to detect ultrasonic echolocations of bats.
- Undertaking a nocturnal survey using spotlights, thermal monocular and active acoustic detections.
- Walking the site to record opportunistic sightings or signs of birds and larger mammals, including calls, tracks, diggings, and scats.
- Recording the outcomes of the trapping and observation activities.

Table 4: Total trap nights

Number of Traps	Number of Nights	Number of Trap nights
23 Box	7	161
20 Funnels		140
14 Pitfall Traps		98
		Total: 399

3.3.1 Weather Conditions

Local weather conditions can affect fauna activity, with low temperatures and rain likely to reduce mammals and reptile activity, which was the case in this survey. The trapping period experienced cool and cloudy mornings, temperatures during the trapping period ranged between 8.7 ^{o}C and 30.4 ^{o}C. Rainfall during the trapping period was recorded at 5.2 mm according to the Swanbourne Weather Station ID: 009215 (BoM, 2026).

3.3.2 Limitations

The limitations associated with the detailed fauna survey undertaken within the site are outlined in Table 5.

Table 5: Limitations associated with the detailed fauna survey

Potential Limitation	Degree of Limitation	Comments
Availability of data and information	None	Local and regional contextual information was readily available.
Competency/experience of the survey team	None	Survey activities were undertaken by qualified environmental scientists who have experience undertaking detailed fauna surveys within the Swan Coastal Plain. The survey was led by a qualified zoologist with over 10 years of experience undertaking fauna surveys.
Scope of the survey	None	Scope of works included terrestrial vertebrates. Invertebrates and marine animals were not included in the scope of works.
Timing, weather and season	None	The survey was undertaken during spring which is the optimal season for fauna surveys within the Swan Coastal Plain subregion. With many migratory bird species potentially occurring within the site, October to March is the optimal time to survey migratory birds within the Swan Coastal Plain. The length of the survey provided trapping opportunities throughout a range of weather conditions, which exhibited cool mornings and moderate to sunny days. A couple of rainy periods were present towards the end of the trapping period. Weather conditions are unlikely to have affected the survey results.
Disturbance that may have affected results	Minor	Public activity within the site restricted the locations of traps, cameras, and acoustic recorders to areas with low risk of public interference. Public activity was high within the dune system, with footprints observed within both fenced and unfenced portions of the site, potentially influencing results. New tracks were observed throughout the survey period, however, it could not be determined if public activity was predominantly nocturnal or diurnal.
The proportion of fauna identified, recorded or collected	None	All species observed and recorded were able to be identified to a species level.
Adequacy of the survey intensity and proportion of survey achieved	None	The survey extent and trapping effort (399 trap nights) was appropriate for the survey area (15 ha), with traps represented across both habitat types with feasible habitat (excluding the beach front). The temporal and physical extent of trapping was in line with recommendations provided in the *Technical Guidance - Terrestrial vertebrate fauna surveys for*

Potential Limitation	Degree of Limitation	Comments
		environmental impact assessment (EPA, 2020). This was complemented by deployment of trail cameras and passive acoustic recorders for 14 consecutive nights. Additional sampling efforts included nocturnal survey, opportunistic sightings and fixed time bird census.
Access problems	None	No access restrictions were present within the survey area.



Figure 6:
Trap Locations

Trigg Beach, City of Stirling

Legend
- Elliott
- Song meter
- Trail cam
- Trapline
- Survey Area

Client:	UDLA
Date:	17/02/2026
Created by:	Natural Area
Image Source:	Nearmap, 2026
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

3.4 Weed Mapping

The survey was conducted in reference to the *Techniques for Mapping Weed Distribution and Cover in Bushland and Wetlands* (Department of Environment and Conservation (DEC), 2011a), utilising the Stirling Natural Environment Coastcare five-class weed cover system. Natural Area qualified environmental scientists undertook the survey between October 31 and November 4, 2025, with key data recorded using QField software on a handheld tablet. Survey activities included:

- Traversing the site using a 15 m grid mapping formation to ensure adequate coverage and to allow repeatability for future monitoring events.
- Recording all weed species in accordance with Stirling Natural Environment Coastcare five-class weed cover system:
    - 0-20 %
    - 21-40 %
    - 41-60 %
    - 61-80 %
    - 81-100 %.
- Marking locations of any declared pests and/or WoNS identified across the survey area.

3.4.1 Limitations

Limitations associated with conducting weed mapping, include:

- The visual assessment methods undertaken in the field are subjective and densities recorded may differ between individuals carrying out field work.
- The survey activities were spring, whilst it is in the primary survey period for the Swan Coastal Plain it is possible that some annual species were not visible at the time of the survey due to differing germination periods.
- Weed control removal was being conducted whilst weed mapping was undertaken, this may alter the species densities and number of species recorded within the site.

4.0 Flora 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 6). 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 6). Conservation code descriptions are provided in Appendix 2.

Leucopogon maritimus (P1) was not recorded within the desktop assessment database searches within a 10 km radius. However, due to the significance of this species and further communication with DBCA (personal communication, November 3, 2025), this species was included as part of the conservation significant search.

Table 6: 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

Species Name	Cons Code (WA)	Cons Code (Cth)	Nature Map	PMST	DBCA
Diuris drummondii	EN	VU		X	
Diuris micrantha	VU	VU		X	
Diuris purdiei	EN	EN		X	
Dodonaea hackettiana	P4		X		X
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 7). 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 7: 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 (floristic community type 29b as originally described in Gibson *et al.* 1994)		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 116 flora species (taxa) were recorded from 40 families during the field survey, comprising of 67 introduced (weeds) and 49 native species. Examples of native flora species are shown in Figure 7. A complete species list is provided in Appendix 4 with quadrat data provided in Appendix 5. Information regarding introduced species are provided in Section 6.0 Weed Mapping Results.



Hardenbergia comptoniana (Native Wisteria)



Exocarpos sparteus (Broom Ballart)



Acanthocarpus preissii



Hemiandra pungens (Snakebush)

Figure 7: Examples of native flora species recorded.

4.2.2 Vegetation Types

A total of four vegetation types were recorded within the site as identified by floristic analysis (this is expanded on in Section 4.2.4 Floristic Analysis), occurring on coastal dunes on unconsolidated soils. The primary dune system consists of *Olearia axillaris* shrubland and **Ammophila arenaria* tussock grassland (OaSAaG) and the secondary dune system is characterised by *Olearia axillaris, Myoporum insulare* and *Spyridium globulosum* shrubland over *Lepidosperma gladiatum* sedgeland (OaMiSgSLgS). The transitional zone between these two vegetation types in the dune swale is characterised as *Olearia axillaris* and *Scaevola crassifolia* shrubland (OaScS).

Additionally, a portion of the OaMiSgSLgS contains sparse *Callitris preissii*, this has been classified separately as *Callitris preissii*, *Myoporum insulare*, *Spyridium globulosum* over *Lepidosperma gladiatum*. (CpMiSgSLgS) due to the presence of *Callitris preissii*. Vegetation types are described in Table 8 and shown in Figure 8.

Table 8: Vegetation types within the site

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*. This vegetation type was recorded primarily within the primary dune system adjacent to the beach.	
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*. This vegetation was recorded within the dune swale between the primary and secondary dune system.	

Vegetation Type	Description	Photograph
Olearia axillaris, Myoporum insulare and *Spyridium globulosum* shrubland over *Lepidosperma gladiatum* sedgeland **(**OaMiSgSLgS)	A shrubland of *Olearia axillaris, Myoporum insulare* and *Spyridium globulosum* over sedgeland of *Lepidosperma gladiatum.* This vegetation was recorded primarily along the secondary dune system.	
Callitris preissii, *Myoporum insulare*, *Spyridium globulosum* over *Lepidosperma gladiatum*. (CpMiSgSLgS)	A shrubland of *Callitris preissii*, *Myoporum insulare*, and *Spyridium globulosum* over a sedgeland of *Lepidosperma gladiatum*. This vegetation type was recorded within the secondary dune system within OaMiSgSLgS.	

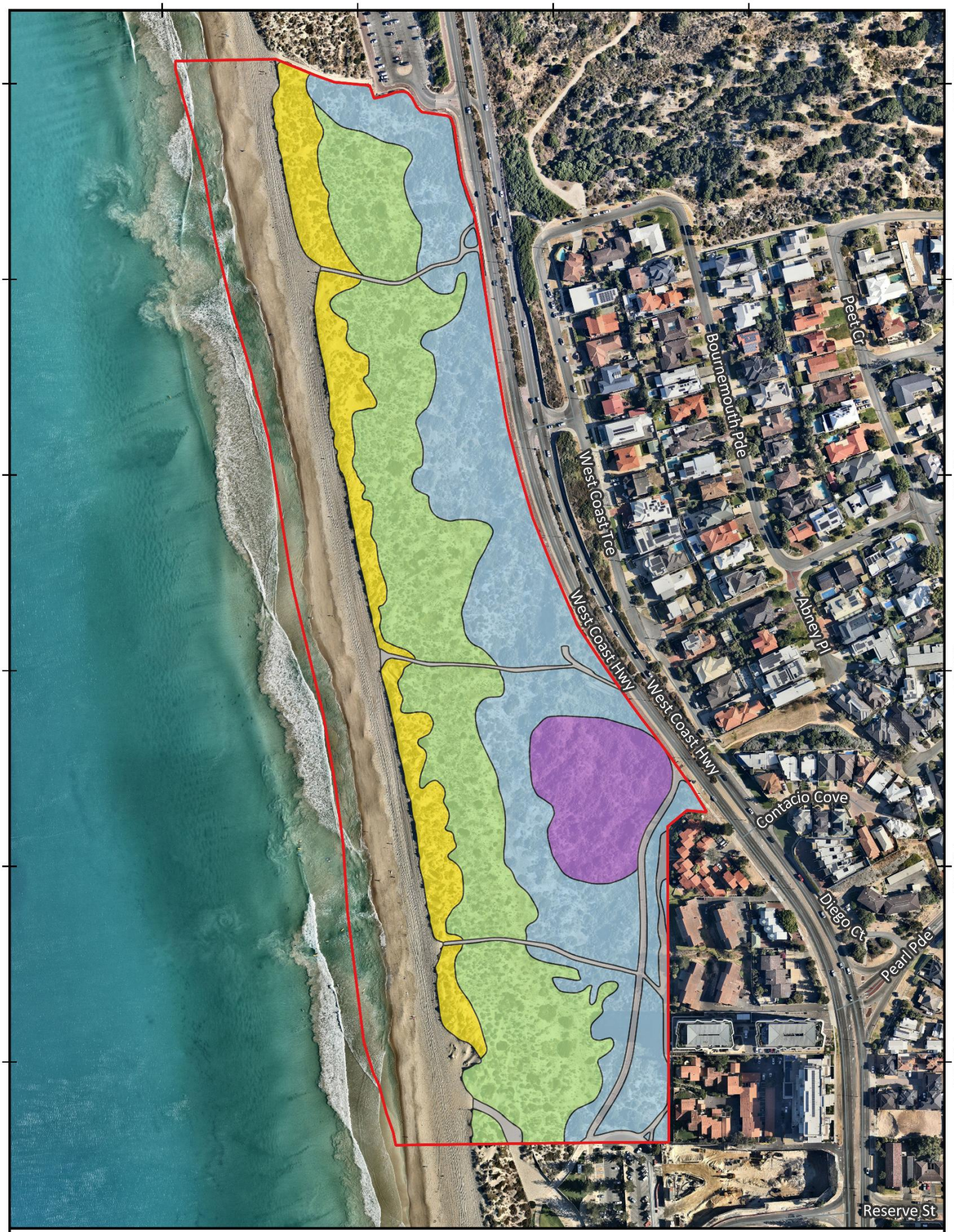


Figure 8:
Vegetation Type

Trigg Beach, City of Stirling

Legend

- OaSAaG
- OaScS
- OaMiSgSLgS
- CpMiSgSLgS
- Cleared
- Survey Area

Client:	UDLA
Date:	17/02/2026
Created by:	Natural Area
Image Source:	Nearmap, 2026
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

4.2.3 Vegetation Condition

Vegetation condition on site ranged from completely degraded to very good (Table 9, 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. Vegetation in very good condition was recorded primarily in the eastern portion of the site. This vegetation contained a high coverage of native flora species with only the presence of some weed species.

Table 9: Vegetation condition within the survey area

Vegetation Condition	Description	Area (ha)	Area (%)	Photograph
Pristine	-	-	-	-
Excellent	-	-	-	-
Very Good	High diversity and coverage of native flora species present within this vegetation condition compared to other conditions within the site. Low weed coverage with some isolated spots of localised weed coverage.	4.51	40.45	
Good	Native flora diversity was present with a mix of native coastal flora species. Weed coverage and species number are high with the presence of aggressive weed species (weed species with a high ecological impact and rapid invasiveness level).	3.94	35.34	
Degraded	High weed loads were prevalent within these areas. A number of native flora species were recorded however the structure is impacted by disturbances, containing a low diversity and coverage of native flora species.	1.24	11.12	

Vegetation Condition	Description	Area (ha)	Area (%)	Photograph
Completely Degraded	Completely degraded areas included cleared paths and infrastructure and a large portion of vegetation type OaSAaG due to the high abundances of the introduced **Ammophila arenaria*. These areas contained only isolated native species typically with high weed densities.	1.46	13.09	



Figure 9:
Vegetation Condition

Trigg Beach, City of Stirling

Legend
- Very Good
- Good
- Degraded
- Completely Degraded
- Survey Area

Client:	UDLA
Date:	17/02/2026
Created by:	Natural Area
Image Source:	Nearmap, 2026
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

4.2.4 Floristic Analysis

An assessment of the quadrats recorded during the survey were compared against the quadrats surveyed by Gibson *et al.* (1994) and Keighery *et al*. (2012) to determine the FCTs. The results from the group dendrogram indicated that the quadrats assessed falls within Supergroup 4, Uplands centred on Spearwood and Quindalup Dunes. The results of the single site insertion was undertaken to mitigate local influences from the quadrats grouping together to assist in validating the results from the grouped similarity of the site (Appendix 6).

The dominant FCT identified within the survey area in the single site insertions were FCT s14 and s13 when assessed against Keighery *et al*. (2012), and FCT 29a and 30a when assessed against Gibson *et al*. (1994). The FCTs are described as:

- FCT s13: Northern *Olearia axillaris* - *Scaevola crassifolia* shrublands
- FCT s14: *Spinifex longifolius* grassland and low shrublands
- FCT 29a: Coastal shrublands on shallow sands
- FCT 30a: *Callitris preissii* and/or *Melaleuca lanceolata* forests and woodlands.

Vegetation type OaSAaG, OaScS and OaMiSgSLgS aligned with FCT 29a when assessed against Gibson *et al.* (1994). When these vegetation types were assessed against Keighery *et al*. (2012), vegetation type OaSAaG and OaScS aligned with FCT s14 located primarily on the first dune system whilst FCT s13 with influences of s14 was recorded in the taller dune system (OaMiSgSLgS).

Vegetation type CpMiSgSLgS was determined to align predominantly with FCT s13, but did display influences of FCTs s11, 29a and 30a when assessed against Keighery *et al*. (2012). This alignment indicates the presence of some species that are known to occur on consolidated dune systems. When assessed against Gibson *et al.* (1994) these quadrats showed a stronger alignment to FCT 30a with some influences to FCT 29a. Similarity dendrograms of the quadrats across the site are provided in Figures 10 to 12.

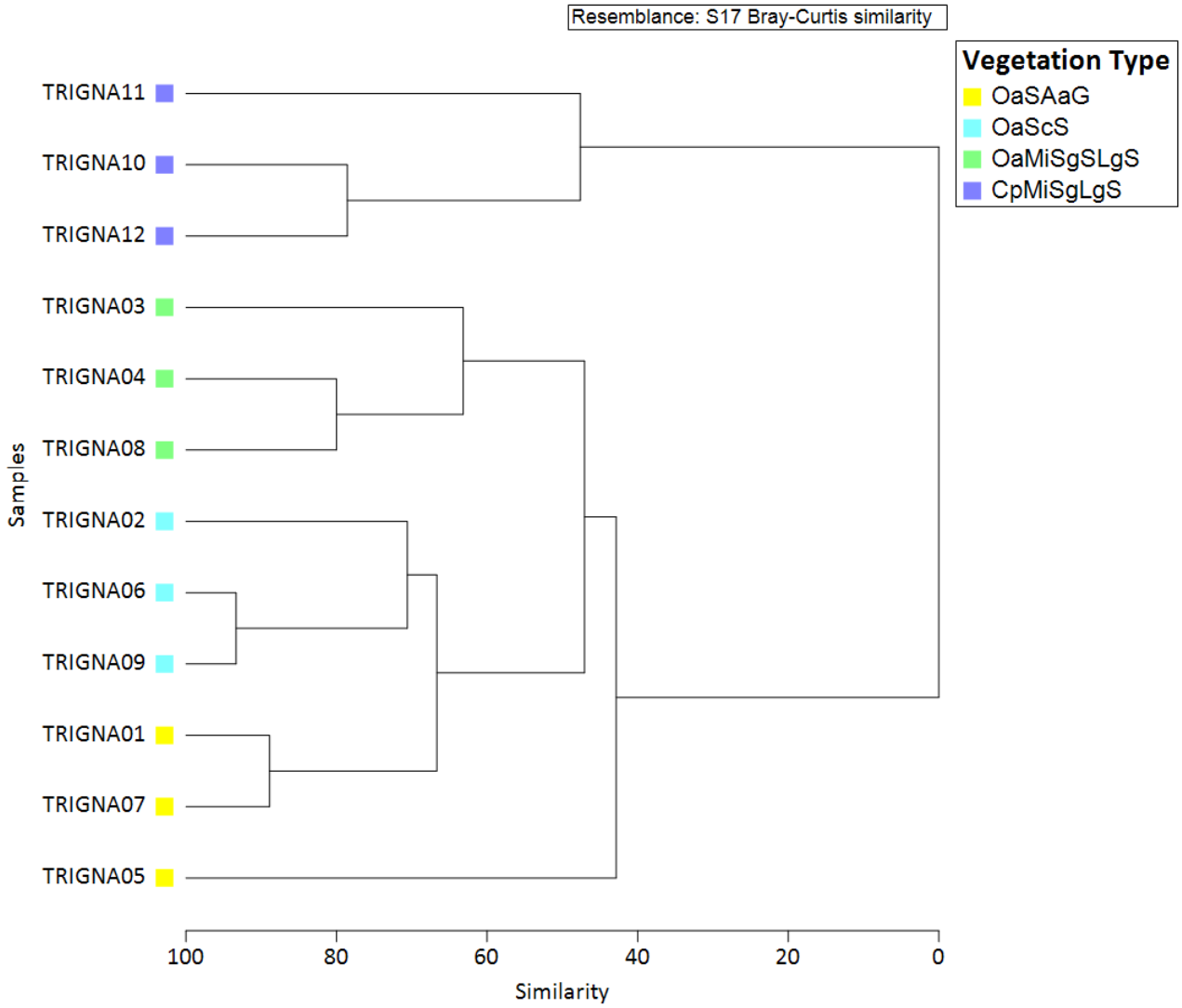


Figure 10: Vegetation types across quadrat similarity.

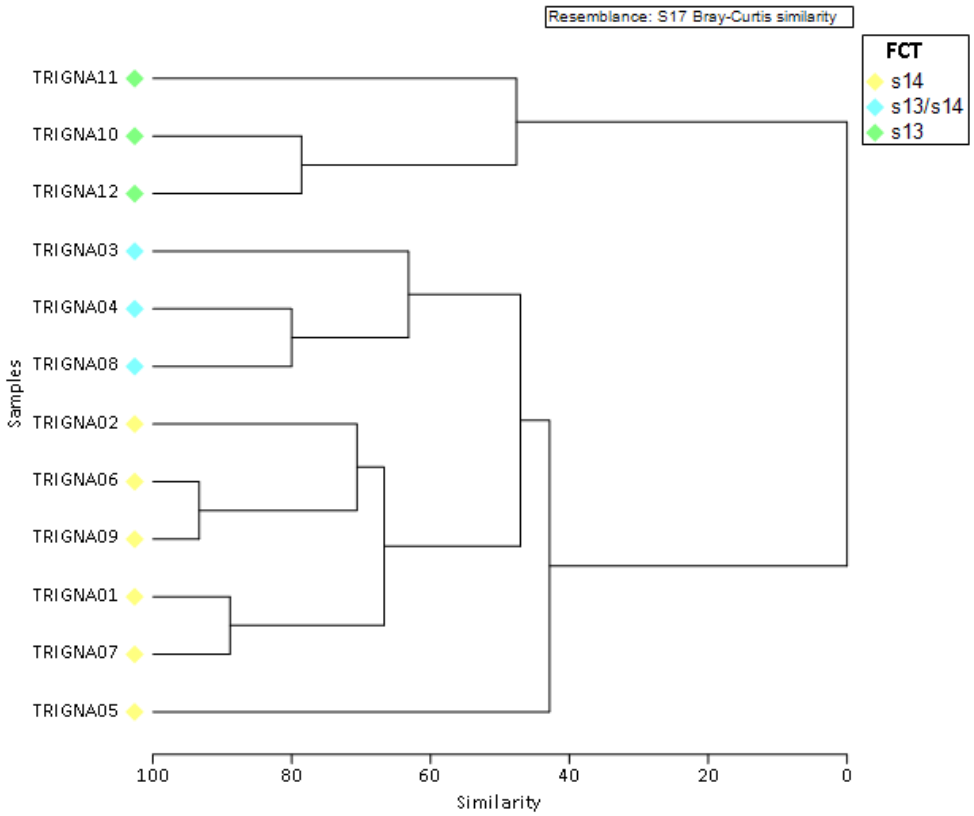


Figure 11: FCT determination against Keighery *et al.* (2012).

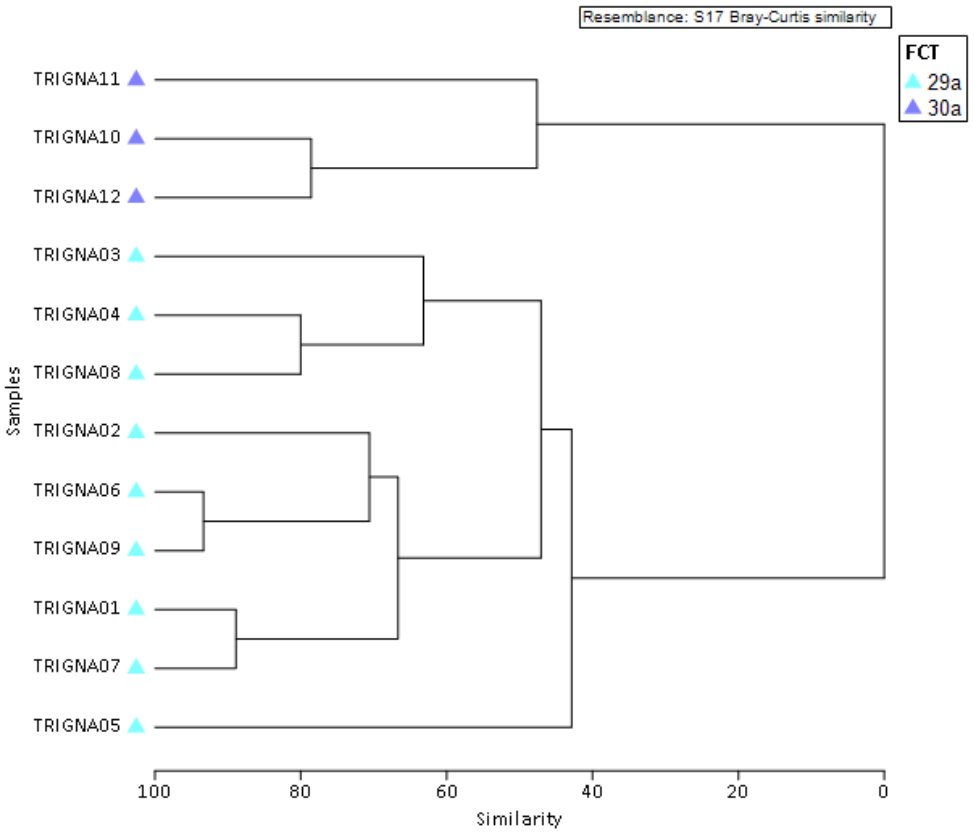


Figure 12: FCT determination against Gibson *et al*. (1994).

4.2.5 Threatened and Priority Communities

To determine the presence of priority and threatened ecological communities listed under Western Australia, quadrat data is required to be compared to the Gibson *et al*. (1994) data (DBCA, 2024). Floristic analysis compared to Gibson *et al.* (1994), identified the potential presence of one priority ecological community and one threatened ecological community. The location of these communities are displayed in Figure 13, these location extents are based on the vegetation types observed in the field and one or many FCTs may be represented over one or many vegetation types.

The potential priority ecological community is FCT 29a: Coastal shrublands on shallow sands listed as Priority 3 by DBCA. This community is described as mostly heaths on shallow sands over limestone close to the coast with no single dominant species, but important species include *Spyridium globulosum*, *Rhagodia baccata*, and *Olearia axillaris*. The nearest known quadrat from the Gibson *et al.* (1994) as FCT 29a has been recorded within 400 m of the site and prior to the development of West Coast Hwy would have historically been continuous with the site. The quadrats within the site were determined to have a low similarity with FCT 29a during the statistical analysis; this may be influenced by the Quindalup Complex being under surveyed by Gibson *et al*. (1994) causing increased likelihood of these FCT being underestimated during the analysis. The area identified to potentially be FCT 29a has been subjected to a wide variety of revegetation efforts over time which may also influence the structure of the community. Whilst a stronger statistical assignment to Keighery *et al.* (2012) was recorded these communities have not been assessed in determining their conservation values.

The threatened ecological community identified during the floristic analysis is FCT 30a: *Callitris preissii* and/or *Melaleuca lanceolata* forests and woodlands. This community has been previously recorded within the survey area (occurrence Scarbr01). This community is listed as Critically Endangered under the BC Act. 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 4 *Callitris preissii* recorded dead and 2 recorded in a poor condition. The dead *Callitris preissii* were all recorded in the east of the community in close proximity to each other, one healthy juvenile *Callitris preissii* was recorded in this location. Two colour forms of *Callitris preissii* were recorded within the site indicating that the population is naturally occurring originating from two parent taxa.



Figure 13:

Threatened and Priority Ecological Community Locations (Indicative)

Trigg Beach, City of Stirling

Legend

- Alive *Callitris preissii*
- Unhealthy *Callitris preissii*
- Dead *Callitris preissii*
- FCT 29a
- FCT 30a
- Survey Area

Client:	UDLA
Date:	17/02/2026
Created by:	Natural Area
Image Source:	Nearmap, 2026
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

5.0 Fauna 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 10). 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, known species' home ranges and high levels of anthropogenic disturbance. Natural Area determined that seven conservation significant fauna species (highlighted green in Table 10) have the potential to utilise the site frequently. Conservation significant migratory shorebirds may be infrequent visitors of the site and have the potential to utilise the area opportunistically but the likelihood for regular or sustained use is low.

Table 10: 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	
Rostratula australis	EN	EN	X	X	X

Species Name	Cons Code (WA)	Cons Code (Cth)	Nature Map	PMST	DBCA
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	
Dasyurus geoffroii	VU	VU	X	X	X
Eubalaena australis	VU	EN & MI	X	X	X

Species Name	Cons Code (WA)	Cons Code (Cth)	Nature Map	PMST	DBCA
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 31 fauna species were recorded across the survey area comprised of 16 birds, 6 mammals and 9 reptiles. Fauna species recorded across the site are provided in Table 11 and examples of native fauna species are shown in Figure 14.

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, 2026). Declared pest legal status and control category definitions are provided in Appendix 7.

One conservation significant fauna species, Caspian Tern (*Hydroprogne caspia*), was observed foraging within the site. Caspian Tern is listed as Migratory under the EPBC Act and BC Act. One individual was recorded foraging in the first dune adjacent to the beach.

Table 11: Fauna observations within the site. * denotes introduced species. Declared pests are highlighted red

Family	Species Name	Common Name
Bird		
Acanthizidae	*Sericornis maculatus*	Spotted Scrubwren
Accipitridae	*Tachyspiza fasciata*	Brown Goshawk
Artamidae	*Gymnorhina tibicen*	Australian Magpie
Cacatuidae	*Eolophus roseicapilla*	Galah
Cacatuidae	*Cacatua sanguinea*	Little Corella
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike
Columbidae	**Spilopelia senegalensis*	Laughing Turtle Dove
Columbidae	**Spilopelia chinensis*	Spotted Turtle Dove
Corvidae	*Corvus coronoides*	Australian Raven
Falconidae	*Falco cenchroides*	Australian Kestrel (Nankeen Kestrel)
Hirundinidae	*Hirundo neoxena*	Welcome Swallow
Laridae	*Chroicocephalus novaehollandiae*	Silver Gull
Laridae	*Hydroprogne caspia*	Caspian Tern
Meliphagidae	*Lichmera indistincta*	Brown Honeyeater
Meliphagidae	*Gavicalis virescens*	Singing Honeyeater
Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail
Mammal		
Canidae	**Vulpes vulpes*	Red Fox
Leporidae	**Oryctolagus cuniculus*	Rabbit
Muridae	**Mus musculus*	
Muridae	**Rattus rattus*	Black Rat
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat
Molossidae	*Austronomus australis*	White-striped Free-tailed Bat
Reptile		
Agamidae	*Ctenophorus adelaidensis*	Western Heath Dragon
Elapidae	*Pseudonaja affinis*	
Elapidae	*Simoselaps bertholdii*	
Scincidae	*Egernia kingii*	King's Skink
Scincidae	*Tiliqua rugosa*	Bobtail
Scincidae	*Ctenotus fallens*	

Family	Species Name	Common Name
Scincidae	*Lerista elegans*	
Scincidae	*Hemiergis quadrilineatus*	
Chelidae	*Chelodina oblonga^*	Oblong Turtle

^ Carapace.



Red Fox (**Vulpes vulpes*)



Rabbit (**Oryctolagus cuniculus*)



Western Heath Dragon (*Ctenophorus adelaidensis*)



King's Skink (*Egernia kingii*)



Singing Honeyeater (*Gavicalis virescens*)



Brown Goshawk (*Tachyspiza fasciata*)

Figure 14: Fauna species observed, including direct and indirect indication of presence. *denotes introduced species.

5.2.2 Fauna Habitat

The mixed coastal shrubland within the site can be broadly grouped into three fauna habitat types, including beach front, open coastal shrubland and closed coastal shrubland (Table 12). The fauna habitat across the site was in variable quality. High quality fauna habitat was recorded within the closed coastal shrubland with a high availability of foraging resources and refuge within the shrubs at the various strata levels.

The vegetation across the site provides good foraging habitat and refuge for native birds, mammals, and reptiles. The low-lying shrubs provide 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 15.

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 116 flora species across the site a total of 6 are known suitable foraging species for Carnaby's Cockatoo (*Zanda latirostris*) and include **Araucaria heterophylla, *Romulea rosea*, *Acacia saligna, #Agonis flexuosa, Callitris preissii,* and *Eucalyptus gomphocephala* (DEC, 2011b; 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.

Table 12: Fauna habitat descriptions

Fauna Habitat	Description	Photo
Beach Front	Sand beaches along coastline, washed up seaweed and crustaceans provide foraging opportunities, particularly for shorebirds and predatory fauna species. This area is highly disturbed from beach activities.	

Fauna Habitat	Description	Photo
Open Coastal Shrubland	Low density of coastal shrubs amongst dune systems and open sand. Limited shelter and exposure to the elements and predators restricts terrestrial fauna density and provides foraging opportunities for predatory fauna such as foxes, kestrels and goshawks.	
Closed Coastal Shrubland	Dense assemblages of coastal shrubs, sedges and grasses amongst dune systems. Shrubs and sedges provide shelter and foraging opportunities for reptiles and small bird species. High prevalence of larger reptiles such as King's Skink (*Egernia kingii*) and Dugite (*Pseudonaja affinis*).	



Figure 15:
Fauna Habitat

Trigg Beach, City of Stirling

Legend
- Beach Front
- Closed Coastal Shrubland
- Open Coastal Shrubland
- Cleared
- Survey Area

Client:	UDLA
Date:	17/02/2026
Created by:	Natural Area
Image Source:	Nearmap, 2026
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

6.0 Weed Mapping Results

A total of 67 introduced (weeds) species were recorded within the site, including 3 dubious species, from 24 families. The dominant families recorded included Poaceae (grass) with 15 species followed by Asteraceae (daisy) with 8 species, and Brassicaceae (mustard) with 5 species. No declared pests or Weeds of National Significance were recorded within the site. Examples of weeds recorded within the site are provided in Figure 16.



Mindiyed (#*Melaleuca nesophila*) | Whiteflower Fumitory (**Fumaria capreolata*)

Cuscuta planiflora* | Hare's Tail Grass (Lagurus ovatus*)

**Aeonium arboreum* | **Reichardia tingitana*

Figure 16: Examples of introduced flora species recorded.

The weed mapping undertaken across the site recorded larger combined weed densities within the low-lying areas of the dunes (Figure 17) and at drainage expel points. High weed density was recorded along the western most portion of the site where the vegetation contained high abundances of **Ammophila arenaria*. Combined weed densities recorded across the site are provided in Figure 18. Grass weed density, woody weed density, other weed density maps are provided in Figures 19 to 21.

High density of weeds recorded correlated primarily with a lower vegetation condition across the site. The drainage pipes that run into the site have a higher number of weed species recorded at their discharge points.

The Ecological Impact and Invasiveness Ratings for the Swan Region (DBCA, 2019) was used as a tool to determine species present with greatest ecological impact and invasiveness. The ecological impact and invasiveness of weed species recorded within the site is summarised in Table 13 and provided for each species in Appendix 8. Out of the weed species present on site, **Araucaria heterophylla, *Euphorbia maculata*, **Ornithogalum arabicum, #Agonis flexuosa,* and *#Eucalyptus* sp. do not have an allocated ecological impact or invasiveness rating.

Table 13: Number of weed species within the survey site based on their impact and invasiveness ratings

	Ecological Impact				**Invasiveness**			
	High	**Medium**	**Low**	**Unknown**	**Rapid**	**Moderate**	**Slow**	**Unknown**
No. of Species	24	4	11	23	34	12	8	8



Figure 17: High weed density recorded within the low lying areas of the dunes.

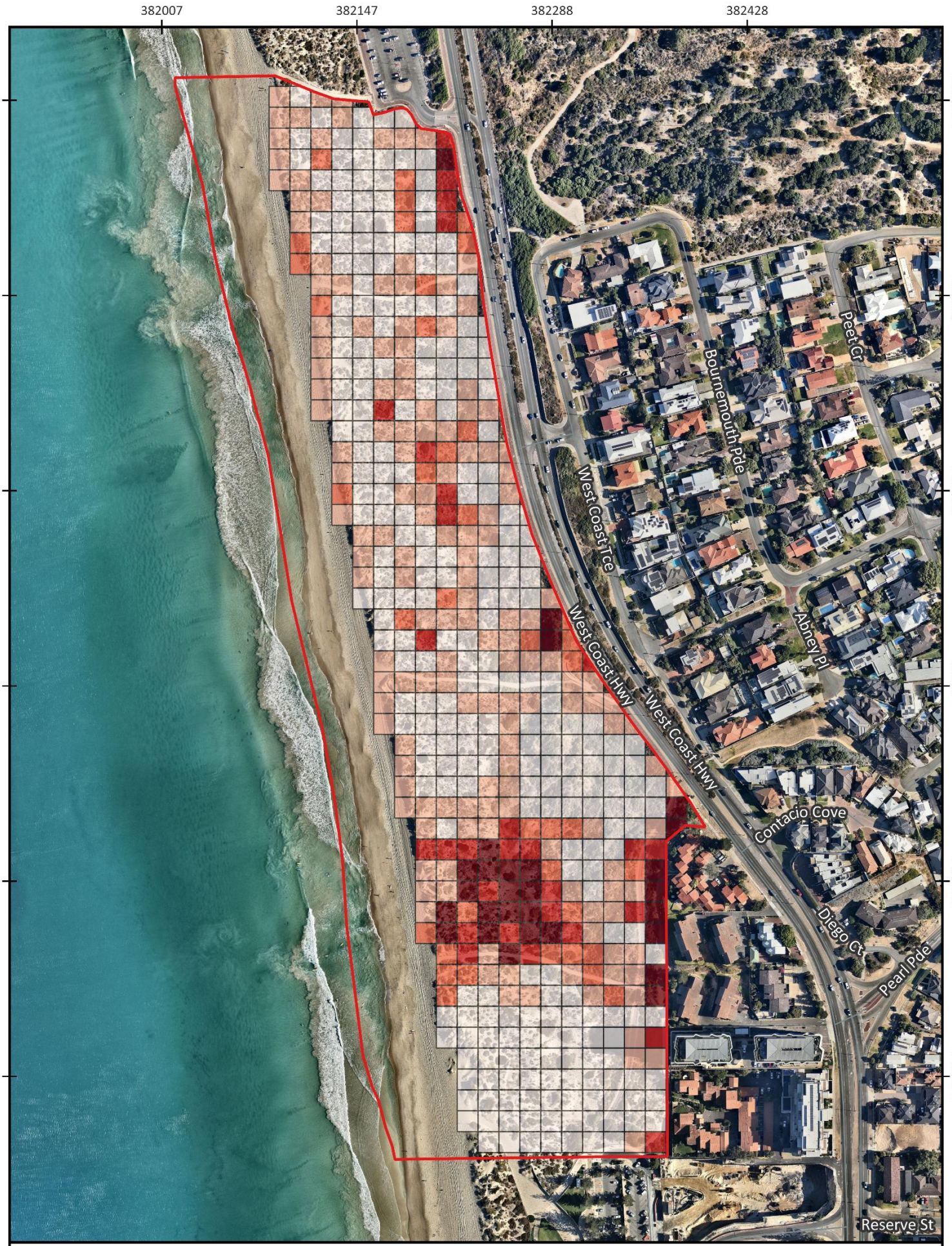


Figure 18:
Combined Weed Coverage

Trigg Beach, City of Stirling

Legend

Weed Coverage Categories
- 0-20 %
- 21-40 %
- 41-60 %
- 61-80 %
- 81-100 %
- Survey Area

Client:	UDLA
Date:	17/02/2026
Created by:	Natural Area
Image Source:	Nearmap, 2026
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

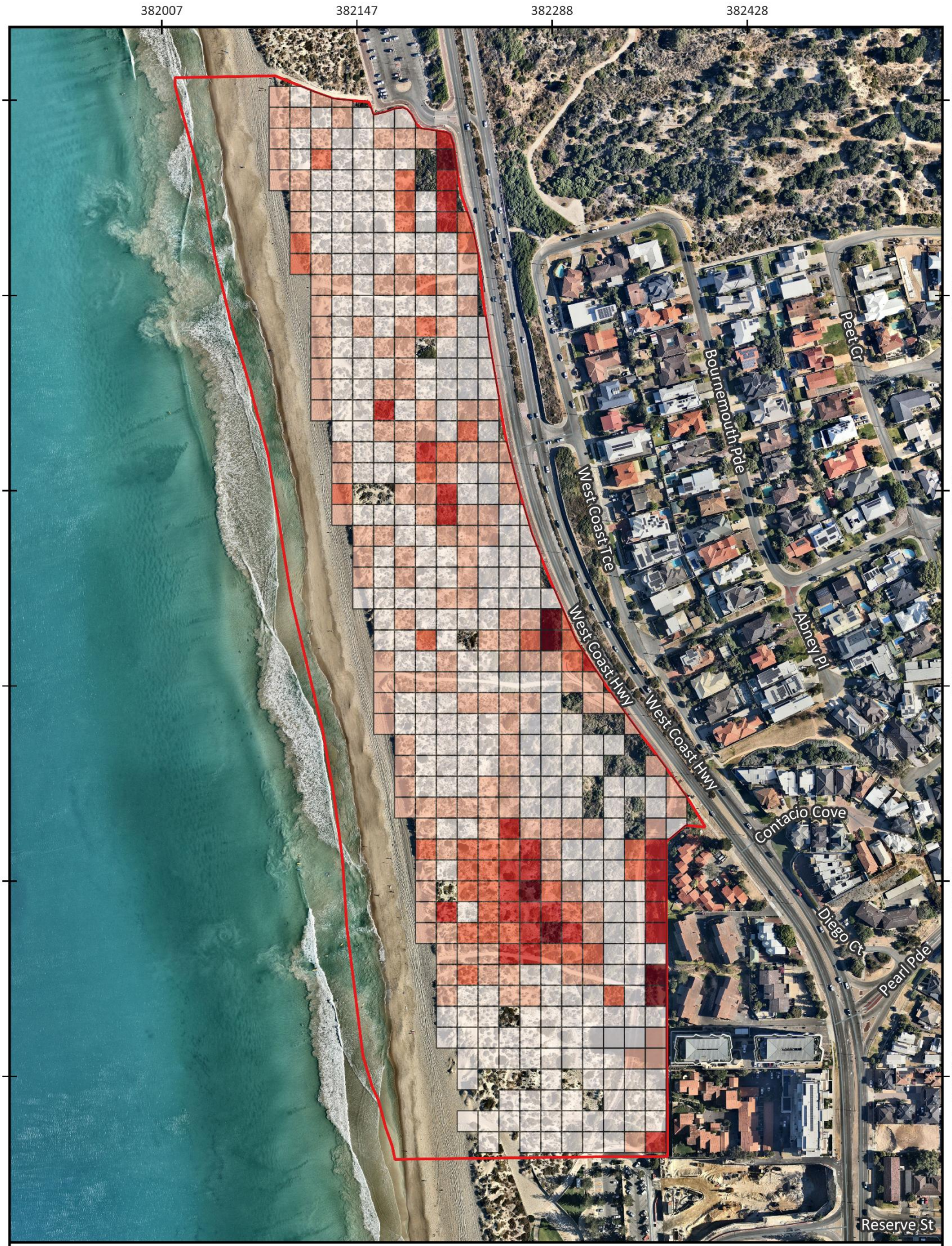


Figure 19:

Combined Introduced Grass Coverage

Trigg Beach, City of Stirling

Legend

Weed Coverage Categories

- 0-20 %
- 21-40 %
- 41-60 %
- 61-80 %
- 81-100 %
- Survey Area

Client:	UDLA
Date:	17/02/2026
Created by:	Natural Area
Image Source:	Nearmap, 2026
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

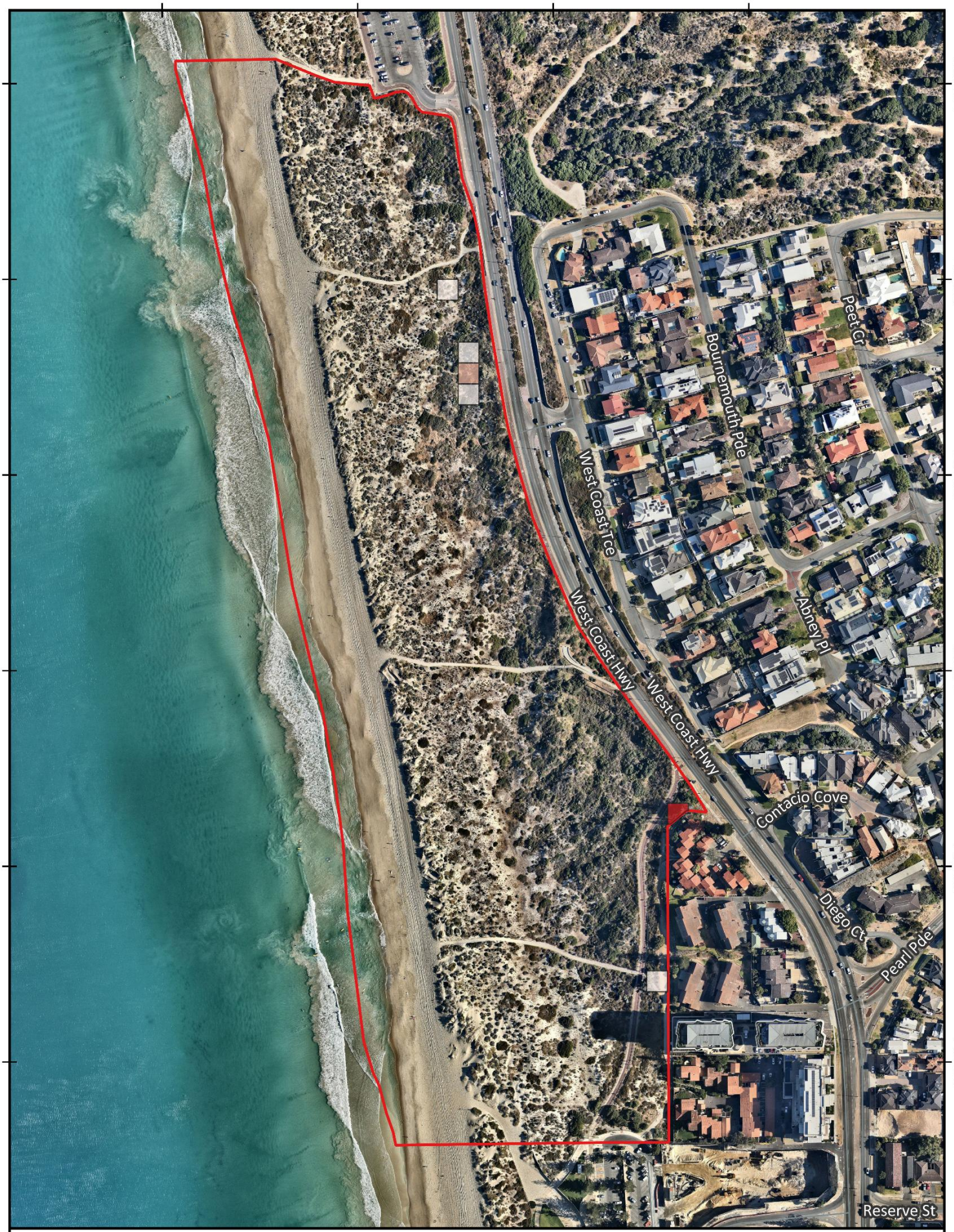


Figure 20:

Combined Woody Weed Coverage

Trigg Beach, City of Stirling

Legend

Weed Coverage Categories

- 0-20 %
- 21-40 %
- 61-80 %
- Survey Area

Client:	UDLA
Date:	17/02/2026
Created by:	Natural Area
Image Source:	Nearmap, 2026
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

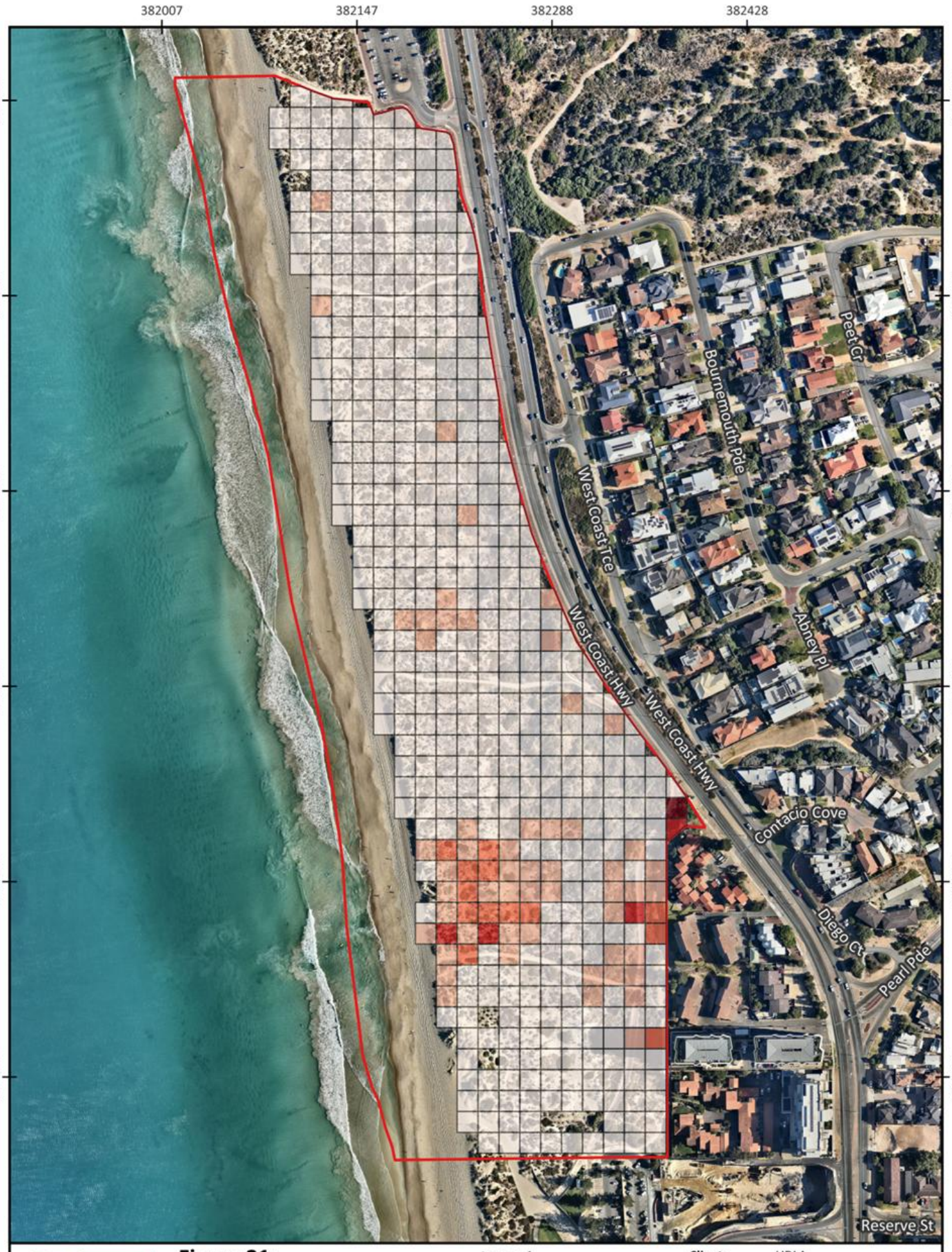


Figure 21:

Combined Other Weed Coverage

Trigg Beach, City of Stirling

Legend

Weed Coverage Categories

- 0-20 %
- 21-40 %
- 41-60 %
- 61-80 %
- 81-100 %
- Survey Area

Client:	UDLA
Date:	17/02/2026
Created by:	Natural Area
Image Source:	Nearmap, 2026
Datum:	GDA2020 / MGA zone 50
Scale:	1: 3500

0 50 100 m

N

7.0 Implications of Results

7.1 Flora and Vegetation

A total of 116 flora species (taxa) were recorded from 40 families during the field survey, comprising of 67 introduced (weeds) and 49 native species. No conservation significant flora species were identified within the survey area.

A total of four native vegetation types were recorded across the survey area. The area has been subjected to weed control and revegetation planting, alongside shifting dunes systems will create variation in the vegetation boundaries and extents over time. The vegetation condition ranged from completely degraded to very good. Variation in vegetation condition between the autumn 2025 survey and spring 2025 survey are present with decreases in vegetation condition within the dune swales due to higher evidence of feral pests (Red Foxes and Rabbits) and higher weed loads.

The dominant FCT identified within the survey area were FCT s14 and s13 when assessed against Keighery *et al*. (2012), and FCT 29a and 30a when assessed against Gibson *et al*. (1994). To determine the listing of the FCT and whether any priority or threatened ecological community occur, the quadrats and vegetation types were assessed against the original Gibson *et al*. (1994) data. However, the Quindalup system where the survey resides on is known to be under sampled within the floristic study undertaken by Gibson *et al*. (1994) (DBCA, 2025e). One priority ecological community and one threatened ecological community was identified within the site, these communities include the Coastal shrublands on shallow sands, southern Swan Coastal Plain ('floristic community type 29a') listed as Priority 3 by DBCA, and *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands of the Swan Coastal Plain ('floristic community type 30a') listed as Critically Endangered under the BC Act.

Active threats to the flora and vegetation within the site observed included invasive weed species, feral pests, erosion and illegal camping. It is recommended that these threats are addressed to mitigate the impact to the existing environmental factors and conserve the environmental values.

7.1.1 Threatened Ecological Communities

A 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), is present within the site. This ecological community is listed as Critically Endangered under the BC Act. Slight variations in the community extent recorded in the field, based on vegetation types observed and the dune system contours, and the stored boundary are present. This variation may be attributed to shifting dune systems which are known to change over time causing variations in vegetation extents. To ensure that the community is protected the maximum boundary extents of both the current field observed boundary and the stored boundary extent by DBCA should be utilised when considering potential impacts. 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 threatened ecological community is already fragmented, with historic aerial imagery indicating a former connection between the occurrence in Trigg Bushland (occurrence TRIGG02) to the threatened ecological

community identified within the site. This vegetation has been fragmented over time through infrastructure development and the construction of West Coast Hwy, including a principal shared path located within 4 m of the threatened ecological community. Due to the size of the remnant vegetation the entire site would be subjected to edge effects, which 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). As the site is actively managed by the City of Stirling edge effects have been mitigated within the existing threatened ecological community through ongoing management practices. However, high weed densities were recorded adjacent to the ecological community; weed invasion is a known threat to the ecological community and if not managed appropriately may alter the floristic community.

It is recommended to avoid clearing and disturbing the threatened ecological community. Disturbances, including 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. It is important that the hydrological processes are not altered as this is a listed key threatening process for the ecological community. Disturbances to the west of the ecological community, located at a lower elevation is unlikely to alter the hydrological regimes or surface flows into the community, however, any disturbances should be positioned at least 15 m away from the ecological community to provide an adequate buffer. The placement of any proposed development needs to consider the importance of the continuation of this threatened ecological community. The recommended buffer for this community is discussed further in City *of Stirling Boardwalk Concept Study - Environmental Survey Autumn* (Natural Area, 2025) and is summarised in Table 14.

It is recommended to rehabilitate and enhance vegetation surrounding the threatened ecological community. To enhance the threatened ecological community the planting of *Callitris preissii* may be considered, it is important that the planting of *Callitris preissii* within the site utilises plants propagated using locally sourced seeds. These should be planted within the recorded extent for this threatened ecological community particularly where dead *Callitris preissii* were recorded. Regardless of the final project design it is recommended to implement rehabilitation within a 50 m radius of the community to improve vegetation condition, mitigate the impact of weed species 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 14: Recommended buffer and 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.

Source: Natural Area (2025).

7.2 Fauna

A total of 31 fauna species were recorded across the survey area comprised of 16 birds, 6 mammals and 9 reptiles. The survey area provides middle and understorey values across the site for native fauna species providing suitable refuge, foraging habitat and habitat connectivity. The species assemblage recorded on site is consistent with fauna typically encountered within coastal areas. High capture rates of King Skinks (90 individuals), *Ctenotus fallens* (55), and Bobtail (27) may be indicative of an established, local population.

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 and surrounding land use reduces suitable fauna habitats, with the remnant vegetation onsite providing refuge for fauna species and supports ecosystem services within a developed area. Light spill from the existing roads and dual use path is evident during the nocturnal surveys and is likely to affect nocturnal fauna by altering natural light regimes and potentially disrupting behavioural patterns (DCCEEW, 2023). The use of lighting within the reserve 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.

One conservation significant fauna species was recorded during the field surveys, *Hydroprogne caspia*, which is a migratory species, listed under the EPBC Act. These are ground nesting shorebirds and given the current land use and high volume of recreational beach activities, it is unlikely that the survey site is suitable to support breeding activity. *Hydroprogne caspia* can be infrequent visitors and forage opportunistically along the beaches and open coastal waters; one individual was recorded foraging within the site during the survey. However, the proposed action is not likely to have a significant impact on breeding or foraging.

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, 2026). Feral animal control is recommended to be undertaken across the site by a licenced vertebrate pest technician following best practices.

Camera traps set up with the survey area recorded Red Fox (**Vulpes vulpes*) predating on Rabbit (**Oryctolagus cuniculus*), if Quenda (*Isoodon fusciventer*) are present within the area they are likely predated on by Red Fox (**Vulpes vulpes*). The lack of recording of Quenda (*Isoodon fusciventer*) during the detailed fauna survey indicates that there is a low likelihood of presence which may be due to predation on by Red Fox (**Vulpes vulpes*).

It is important to mitigate habitat fragmentation by designing proposed developments to allow for the movement of fauna species within 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. Raised boardwalks also direct footfall which can assist in reducing the potential degradation of the vegetation from trampling or erosion.

7.3 Weed Mapping

A total of 67 introduced (weed) species were recorded during the weed mapping survey. Previous weed mapping events have been undertaken in 2011, 2014 and 2024 within the site (Fisher Research Pty Ltd., 2024). The weed mapping undertaken in the previous surveys were undertaken over a larger area, including vegetation to the south of the current survey extent. The 2011 weed survey identified a total of 41 introduced species and decreased to a total of 35 in the 2014 weed survey before increasing to a total of 46 species in 2024. The 2025 survey recorded an increase of 21 introduced species compared to the 2024 survey.

The variations in species presence may be due to seasonal factors and that some species present earlier or later in the season. In 2025, higher than average rainfall was recorded between June and October (BoM, 2026). This increased rainfall may have presented higher densities and presence of introduced flora species. A comparison of the number of weed species recorded over the survey years are provided in Table 15, and the detection of each individual species across the survey years is provided in Appendix 9.

Higher weed densities were recorded within the dune swales, at drainage expel points, adjacent to West Coastal Highway and within the primary dune (containing high density of **Ammophila arenaria).* The previous reports have recorded increased weed invasion over time particularly within the primary dune and the dune swale (Fisher Research Pty Ltd., 2024).

Table 15: Summary of number of weed species and families recorded

	2011	2014	2024	2025
Species	41	35	46	67
Family	18	14	17	24

7.3.1 Weed Prioritisation

The *Ecological Impact and Invasiveness Ratings for the Swan Region* (DBCA, 2016) was used as a tool to determine weed management priorities for the species recorded within the site. The prioritisation process can be used to inform management recommendations and treatment strategies for the species present through focusing on species with greatest ecological impact, as well as any site-specific requirements (Department of Parks and Wildlife (DPaW), 2013).

7.3.2 Weed Management

Weed species across the site were mapped and categorised by the treatment types required (based on the type of weed), and the percentage cover of weeds within the denoted areas. Characteristics of a particular species determines the most appropriate type of weed control method/s and can typically be found on the FloraBase website (Western Australian Herbarium, 1998-). A summary of recommended treatment types and methodology for the weeds present are described in Table 16.

The management of weeds in areas in very good condition and in the threatened ecological community should be prioritised to mitigate the spread of weeds and to conserve existing biodiversity and environmental values. Weed management within native vegetation should be implemented precisely to ensure that no off-target damage to native vegetation occurs. Management strategies should prioritise the

removal of woody weeds with a high ecological impact and rapid invasiveness, and to undertake regular weed control to mitigate weed germination and reduce their spread across the site.

Weed management activities should be undertaken by suitably qualified personnel and ensure the correct timing and methodology is employed for each weed species. Weed species recorded and their treatment are provided in Appendix 8. A combination of techniques can be employed across the site including, spot spraying, cut and paint/basal bark/drill and fill, and hand weeding/felling.

**Ammophila arenaria* is recorded in high densities near the beach front within OaSAaG. This species has a 'high' ecological impact and 'slow' invasiveness *(*DBCA, 2016). Despite **Ammophila arenaria* being an introduced species it provides dune stabilisation which is required to prevent erosion across the western portion of the site. Native species such as *Spinifex hirsutus* and *Spinifex longifolius* provide dune stabilisation due to their lateral roots that trap and bind sand. It is recommended to undertake a staged recovery plan that progressively infills this vegetation type with native plants that provide dune stabilisation and remove **Ammophila arenaria* as the native species establish.

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. These drainage points recorded high number of weed species and higher densities of weed species. It is recommended that these areas are prioritised for weed control due to the high susceptibility of new weed species being introduced through these points.

Natural Area recommends undertaking the following treatment plan for the site:

1. Removal of woody weeds with a high ecological impact and rapid invasiveness, such as **Gaudium laevigatum.*
2. Management of high ecological impact weed species recorded in areas in very good condition and threatened ecological communities, and the adjacent vegetation.
3. Management of medium ecological impact weed species recorded in areas adjacent to native vegetation using the assigned method outlined in Table 16.
4. Management of other weed species on an ad-hoc basis.
5. Infill planting within OaSAaG of *Spinifiex hirsutus* and *Spinifex longifolius* to promote dune stablisation whilst removing the introduced **Ammophila arenaria.*
6. Regular monitoring of the drainage expel points in the reserve to remove new weeds.

Weed treatment should be undertaken annually to mitigate the spread and impact of weed species within the reserve. The City of Stirling and Stirling Natural Environment Coastcare (SNEC) currently undertake restoration and weed management within the dunes. We recommend the City of Stirling continue to enhance its partnership with SNEC to ensure ongoing collaboration, knowledge sharing, and coordinated management of environmental values within the area.

Table 16: Treatment types for each targeted species and the application method

Treatment Number	Treatment Type	Targeted Species	Application Method and Comments
1	Non-selective (Glyphosate/Biactive Glyphosate)	Annual and perennial grass and broadleaf weeds.	Spot spray target species.
2	Grass selective (e.g. Fusilade)	Annual and perennial grasses.	Spot spray - selective grass spray (will affect native grass species).
3	Selective (Metsulfuron)	Annual broadleaf weeds and bulbs.	Spot spray - semi selective.
4	Wick wipe (Glyphosate & Metsulfuron wipe)	**Ornithogalum arabicum*	Wipe leaves with sponge prior to or just on flowering
5	Woody weeds (Triclopyr, Picloram, or Glyphosate)	Woody weeds and trees.	Cut and paint, basal bark or drill and fill.
6	Manual removal/hand weeding	Carnation weeds (*Euphorbia* sp.), Fleabane (*Erigeron* sp.) and other similar species including woody weed seedlings when small.	Gloves required due to caustic sap of Carnation weeds. Manual removal can also include slashing
7	Selective (Triasulfuron)	Carnation weeds (*Euphorbia* sp.), Fleabane (*Erigeron* sp.) and other similar species including woody weed seedlings when small.	Spot spray target species

8.0 Recommendations

The survey area provides high quality vegetation with a diverse range of coastal flora species. The findings of the spring survey should be taken into consideration when planning and assessing future development within the site, such as the proposed boardwalk, to ensure that environmental values and seasonal ecological factors are appropriately considered in the development process. It is recommended to avoid the clearing of native vegetation where possible and where this is not possible mitigation measure should be undertaken and include:

- Minimising the amount of clearing of vegetation within a good to very good condition.
- Designing the proposed development to minimise impact to the threatened ecological community present onsite by adhering to recommended buffers.
- Minimising impact to the ecological linkage and reduce habitat fragmentation by ensuring that the proposed development allows for the movement of fauna species within the reserve.
- Development of an environmental management plan to minimise indirect impacts.
- Minimising the impact of artificial lighting on fauna species by following best practice principles.

The site is subjected to potential coastal erosion hazards. Management and adaptation pathways applied to the existing assets should be integrated into the project design to ensure long term resilience. Management and adaptation measures should follow those outlined by Coterra Environment (2024).

It is important to improve vegetation condition where possible within the reserve to conserve and enhance environmental values and to reduce threats. It is recommended to improve vegetation in degraded or completely degraded condition across the site to a minimum of good condition. Due to the size of the reserve, current usage and anthropogenic impacts, the entire site is subjected to edge effects. Edge effects and maintaining the viability of natural areas can be maintained through active management. The following restoration and management actions are recommended to be undertaken:

- Weed control, by prioritising:
    - Removal of woody weeds with a high ecological impact and rapid invasiveness, such as **Gaudium laevigatum*
    - Management of high ecological impact weed species recorded in areas in very good condition and threatened ecological communities, and the adjacent vegetation.
    - Management of medium ecological impact weed species recorded in very good condition and threatened ecological communities.
    - Management of other weed species on an ad-hoc basis.
- Regular monitoring within drainage expel points to identify and remove new weed species, this will prioritise the removal of these species prior to spreading.
- Revegetation activities, particularly within OaSAaG and OaScS, by undertaking:
    - Planting of native dune stabilising plants within OaSAaG such as *Spinifex hirsutus* and *Spinifex longifolius* and as these establish undertake a staged removal of **Ammophila arenaria*.
    - Planting of native flora species within OaScS to increase diversity whilst removing introduced weed species.

- Feral animal control by a licenced vertebrate pest technician following best practices, targeting the removal of Red Fox (**Vulpes vulpes*) and Rabbit (**Oryctolagus cuniculus*) to alleviate the harmful impacts of these species.

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. It is recommended that DBCA is consulted as part of the management plan due to the presence of the threatened ecological community and to ensure compatibility with conservation objectives and to support ongoing protection and viability of the community.

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 enhance its partnership with Stirling Natural Environment Coastcare to ensure ongoing collaboration, knowledge sharing, and coordinated management of environmental values within the area.

9.0 References

Bureau of Meteorology. (2019). *Terrestrial Groundwater Dependent Ecosystems* [Data set].

Bureau of Meteorology. (2026). *Climate and Weather Statistics – Swanbourne Site ID 009215*, retrieved January 2026 via: http://www.bom.gov.au/climate/averages/tables/cw_009215.shtml

Cardno. (2023a). *City of Stirling Coastal Hazard Risk Management and Adaptation Plan – Chapter 1: Establish the Context.* Prepared for City of Stirling on 23/06/2023.

Cardno. (2023b). *City of Stirling Coastal Hazard Risk Management and Adaptation Plan – Chapter 2: Risk Identification.* Prepared for City of Stirling on 23/06/2023.

Cardno. (2023c). *City of Stirling Coastal Hazard Risk Management and Adaptation Plan – Chapter 3: Vulnerability Assessment and Risk Evaluation.* Prepared for City of Stirling on 23/06/2023.

Cardno. (2023d). *City of Stirling Coastal Hazard Risk Management and Adaptation Plan – Chapter 4: Risk Treatment.* Prepared for City of Stirling on 23/06/2023.

Cardno. (2023e). *City of Stirling Coastal Hazard Risk Management and Adaptation Plan – Chapter 5: Implementation.* Prepared for City of Stirling on 23/06/2023.

Coterra Environment (2024). *Preliminary Environmental Opportunities and Constraints Assessment City of Stirling Proposed Coastal Boardwalk.* Unpublished report prepared for the City of Stirling.

Del Marco, Andrew & Western Australian Local Government Association & Perth Biodiversity Project (W.A.). (2004). *Local government biodiversity planning guidelines for the Perth Metropolitan Region*. West Perth, W.A. : Western Australian Local Government Association

Department of Agriculture, Water, and the Environment (DAWE). (2022). *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black-cockatoo.* Retrieved from https://www.dcceew.gov.au/sites/default/files/documents/referralguideline-3-wa-threatened-black-cockatoo-species-2022.pdf.

Department of Biodiversity, Conservation and Attractions (DBCA). (2018). Carnabys Cockatoo Areas requiring investigation as feeding habitat in the Swan Coastal Plain (SCP) IBRA Region (DBCA-057) [Data set]. https://catalogue.data.wa.gov.au/dataset/carnabys-cockatoo-unconfirm-feeding-areas-scp

Department of Biodiversity, Conservation and Attractions (DBCA). (2016). *Prioritisation process for weed management*.

Department of Biodiversity, Conservation and Attractions (DBCA). (2023). *Conservation Codes.* https://www.dbca.wa.gov.au/media/792/download

Department of Biodiversity, Conservation and Attractions (DBCA). (2024). Methods for survey and identification of Western Australian threatened ecological communities. Species and Communities Program.

Department of Biodiversity, Conservation and Attractions (DBCA). (2025a). *NatureMap*. Prepared by the Species and Communities program for UDLA and Natural Area for environmental assessment.

Department of Biodiversity, Conservation and Attractions (DBCA). (2025b). Threatened and Priority Flora Database Search for Trigg Beach retrieved 17 April 2025. Prepared by the Species and Communities program for UDLA and Natural Area for environmental assessment.

Department of Biodiversity, Conservation and Attractions (DBCA). (2025c). *Threatened and Priority Fauna Database Search* for Trigg Beach retrieved 17 April 2025. Prepared by the Species and Communities program for UDLA and Natural Area for environmental assessment.

Department of Biodiversity, Conservation and Attractions (DBCA). (2025d). *Threatened and Priority Ecological Communities Database Search* for Trigg Beach retrieved 28 March 2025. Prepared by the Species and Communities program for UDLA and Natural Area for environmental assessment.

Department of Biodiversity, Conservation and Attractions (DBCA). (2025e). *Methods for survey and identification of Western Australian threatened ecological communities.* Species and Communities Program

Department of Climate Change, Energy and the Environment (DCCEEW). (2023). National Light Pollution Guidelines for Wildlife. Department of Climate Change, Energy, the Environment and Water. Canberra, May. CC BY 4.0.

Department of Climate Change, Energy, the Environment and Water (DCCEEW). (2025a). Interim Biogeographic Regionalisation for Australia (IBRA) Version 7 (Subregions) [Data set].

Department of Climate Change, Energy and the Environment (DCCEEW). (2025b). *Protected Matters Search Tool.* Retrieved from http://www.environment.gov.au/epbc/pmst/

Department of Environment and Conservation (DEC). (2011a). *Techniques for Mapping Weed Distribution and Cover in Bushland and Wetlands*. https://www.dpaw.wa.gov.au/images/documents/plants-animals/monitoring/sop/sop221_weed_mapping.pdf

Department of Environment and Conservation (DEC). (2011b). *Plants Used by Carnaby's Black Cockatoo*. Retrieved from https://www.dpaw.wa.gov.au/apps/plantsforcarnabys/index.html.

Department of Parks and Wildlife (DPaW). (2013). *Weed Prioritisation Process for DPaW*. Retrieved from https://www.dbca.wa.gov.au/management/threat-management/weeds

Department of Planning, Land and Heritage (DPLH). (2019). Bush Forever Areas 2000 (DPLH-019) [Data set]. https://catalogue.data.wa.gov.au/dataset/bush-forever-areas-2000-dop-071

Department of Primary Industries and Regional Development (DPIRD). (2019). 2 metre contours (DPIRD-072) [Data set]. https://catalogue.data.wa.gov.au/dataset/dpird-2-metre-contours

Department of Primary Industries and Regional Development (DPIRD). (2022a). Soil Landscape Mapping - Systems (DPIRD-064) [Data set]. https://catalogue.data.wa.gov.au/dataset/soil-landscape-mapping-systems

Department of Primary Industries and Regional Development (DPIRD). (2022b). Soil Landscape Mapping - Best Available (DPIRD-027) [Data set]. https://catalogue.data.wa.gov.au/dataset/soil-landscape-mapping-best-available

Department of Primary Industries and Regional Development (DPIRD). (2026). *Western Australian Organism List.* Retrieved from https://www.agric.wa.gov.au/bam/western-australian-organism-list-waol

Department of Water and Environmental Regulation (DWER). (2018). *A Guide to Preparing Revegetation Plans for Clearing Permits.* Department of Water and Environmental Regulation, Perth.

Department of Water and Environmental Regulation (DWER). (2021). Clearing Regulations - Environmentally Sensitive Areas (DWER-046) [Data set]. https://catalogue.data.wa.gov.au/dataset/clearing-regulations-environmentally-sensitive-areas-dwer-046

Environmental Protection Authority. (2016). *Technical Guidance - Flora and Vegetation survey for Environmental Impact Assessment*. http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.

Environmental Protection Authority. (2020). *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment*. https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA-Technical-Guidance-Vertebrate-Fauna-Surveys.pdf.

Executive Steering Committee for Australian Vegetation Information (ESCAVI). (2003). Australian Vegetation Attribute Manual: National Vegetation Information System, Version 6.0. Department of Environment and Heritage, Canberra. https://www.dcceew.gov.au/sites/default/files/env/pages/06613354-b8a0-4a0e-801e-65b118a89a2f/files/vegetation-attribute-manual-6.pdf

Fisher Research Pty Ltd. (2024). *Re - Map of The City of Stirling Coastal Zone between South Trigg car park and north Scarborough car parks*. Unpublished report prepared for Stirling Natural Environment Coastcare Inc.

Gibson, N., Keighery, B. J., Keighery G.J., Burbidge, A.H., & Lyons, M. N. (1994). *A floristic Survey of the Southern Swan Coastal Plain*. Perth, W.A: Department of Conservation and Land Management and Conservation Council of Western Australia.

Government of Western Australia. (2000). *Bush Forever (Vol. 2).* Department of Environmental Protection, Perth, Western Australia.

Government of Western Australia. (2025). *2024 Swan Coastal Plain Vegetation Statistics*. Current as of June 2025. Department of Water and Environmental Regulation, Joondalup.

Heddle, E., Loneragan, O., and Havel, J. (1980). Vegetation Complexes of the Darling System Western Australia. In *Atlas of Natural Resources - Darling System, Western Australia* (pp. 37 - 72). Canberra, W.A: Department of Conservation and Environment, Western Australia.

Invasive Plants and Animals Committee. (2016). *Australian Weeds Strategy 2017 to 2027.* Australian Government, Department of Agriculture and Water Resources, Canberra.

Invasive Plants and Animals Committee. (2017). *Australian Pest Animal Strategy.* Australian Government, Department of Agriculture and Water Resources, Canberra.

Keighery B.J., Keighery G.J., Longman V.M., & Clarke K.A. (2012). Native *and Weed Flora of the Southern Swan Coastal Plain: 2005 Dataset.* Department of Environment and Conservation, Kensington, Western Australia.

Landgate. (2025). Native Title (ILUA) (LGATE-067) [Data set]. https://catalogue.data.wa.gov.au/dataset/native-title-ilua-lgate-067

Mitchell, D., Williams, K., & Desmond, A. (2002). Swan Coastal Plain 2 (SWA2 - Swan Coastal Plain subregion). In May, J. E. & McKenzie, N. L. (Eds.), *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002* (pp. 606 - 623). https://library.dbca.wa.gov.au/static/FullTextFiles/021927.pdf

Natural Area Consulting Management Services (Natural Area). (2015). *Trigg Bushland Reserve Management Plan.* Unpublished report prepared for the City of Stirling.

Natural Area Consulting Management Services (Natural Area). (2018). *Trigg Bushland Reserve Callitris preissii woodland Threatened Ecological Community Management Recommendations.* Unpublished report prepared for the City of Stirling.

Natural Area Consulting Management Services (Natural Area). (2025). City *of Stirling Boardwalk Concept Study - Environmental Survey Autumn. Unpublished report prepared for UDLA.*

Natural Resource Management Ministerial Council. (2010). *Australia's Biodiversity Conservation Strategy 2010-2030.* Australian Government, Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Western Australian Herbarium. (1998-). *FloraBase - The Western Australian Flora.* https://florabase.dpaw.wa.gov.au/.

Western Australian Local Government Association. (2004). *Perth Regional Ecological Linkages* [Data set].

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
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

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.

© Commonwealth of Australia
Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111

Appendix 2: Conservation Codes

A2.1 Flora and Fauna

State Flora and Fauna Conservation Codes under the *Biodiversity Conservation Act 2016* (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 2016* (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		-	-	-	P2	N	Habitat unsuitable

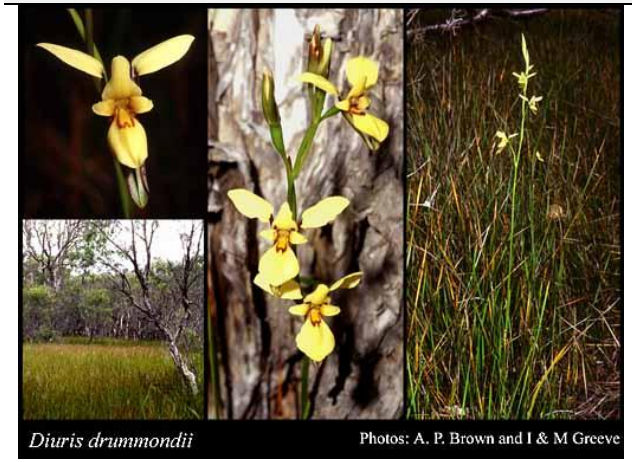
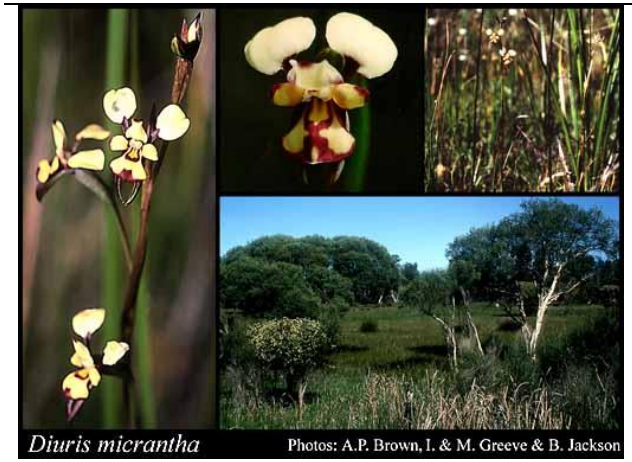
Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N)	Comment
 *Amanita carneiphylla*		Pastel pink gills (near Methuen 8A2 to 9A2) which dull (near Methuen 9B2) but remain pink in old age; (ii) Finely striate pendulous persistent superior annulus; (iv) Multiple 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.	-	Deeply rooting in sandy soil, solitary or in small scattered groups	P3	N	Habitat unsuitable
Amanita preissii	Cinnamon-ring Lepidella	-	-	-	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

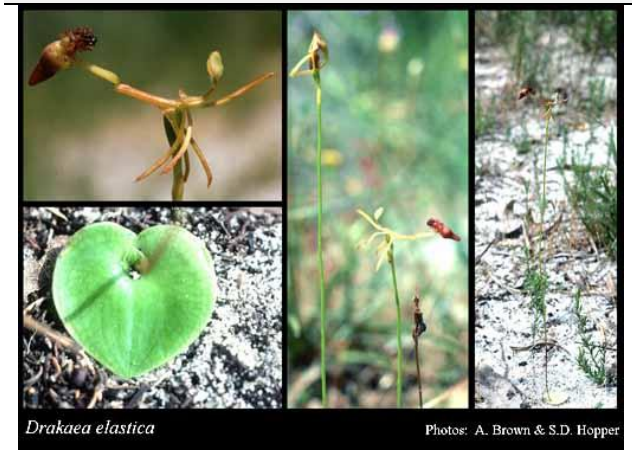
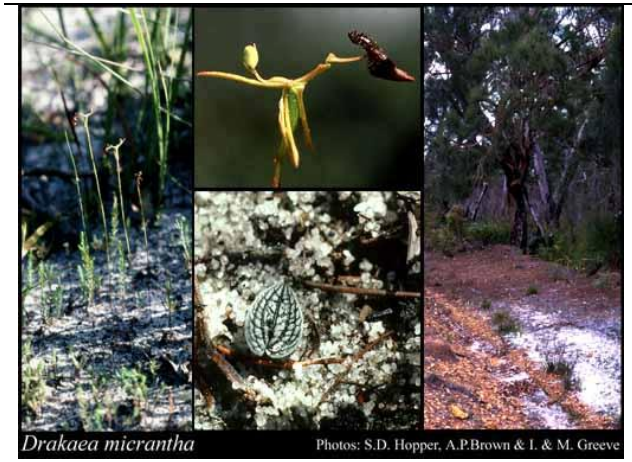
Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N)	Comment
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)		-	-	-	P1	N	Habitat unsuitable
 *Banksia mimica*	Summer Honeypot	Prostrate, lignotuberous shrub, 0.15-0.4 m high. Fl. yellow-brown.	Dec or Jan to 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

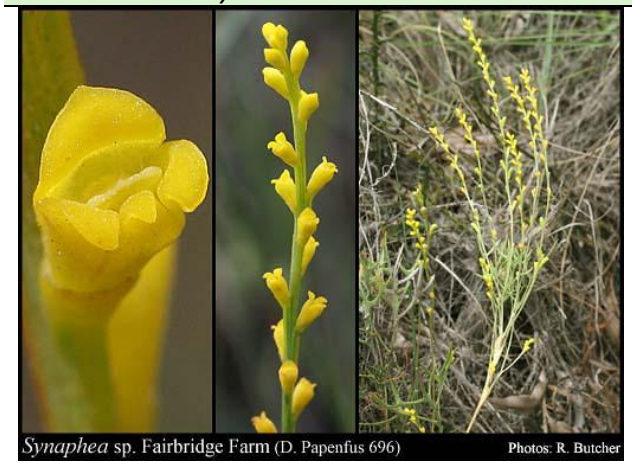
Taxon Name	Common Name	Description	Flowering Period	Habitat Type	Cons Code (WA)	Likelihood (Y/N)	Comment
 *Diuris purdiei*	Purdie's Donkey Orchid	Tuberous, perennial, herb, 0.15-0.35 m high. Fl. Yellow.	Sep to Oct.	Grey-black sand, moist. Winter-wet swamps.	T/EN	N	Habitat unsuitable
 *Dodonaea hackettiana*	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		-	-	-	P2	N	Habitat unsuitable
Hibbertia leptotheca		-	-	-	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: Species List

The complete flora list for the site is provided in the table below with flora listed by family. *Denotes introduced species and # denotes species that are native to Western Australia but not to this local region.

Family	Species	Common Name
Aizoaceae	**Carpobrotus edulis*	Hottentot Fig
Aizoaceae	**Carpobrotus edulis* x *virescens*	
Aizoaceae	**Tetragonia decumbens*	Sea Spinach
Aizoaceae	*Carpobrotus virescens*	Coastal Pigface
Araucariaceae	**Araucaria heterophylla*	
Asparagaceae	**Ornithogalum arabicum*	Lesser Cape Lily
Asparagaceae	*Acanthocarpus preissii*	
Asparagaceae	*Lomandra maritima*	Maritime Mat Rush
Asphodelaceae	**Asphodelus fistulosus*	Onion Weed
Asphodelaceae	**Trachyandra divaricata*	
Asteraceae	**Arctotheca calendula*	Cape Weed
Asteraceae	**Erigeron bonariensis*	
Asteraceae	**Erigeron sumatrensis*	
Asteraceae	**Gazania linearis*	
Asteraceae	**Osteospermum ecklonis*	
Asteraceae	**Reichardia tingitana*	False Sowthistle
Asteraceae	**Sonchus oleraceus*	Common Sowthistle
Asteraceae	**Urospermum picroides*	False Hawkbit
Asteraceae	*Leucophyta brownii*	
Asteraceae	*Olearia axillaris*	Coastal Daisy Bush
Asteraceae	*Pithocarpa cordata*	Tangle Daisy
Asteraceae	*Senecio pinnatifolius*	
Brassicaceae	**Brassica tournefortii*	Mediterranean Turnip
Brassicaceae	**Cakile maritima*	Sea Rocket
Brassicaceae	**Lobularia maritima*	Sweet Alyssum
Brassicaceae	**Matthiola incana*	Common Stock
Brassicaceae	**Raphanus raphanistrum*	Wild Radish
Caryophyllaceae	**Cerastium balearicum*	

Family	Species	Common Name
Casuarinaceae	**Casuarina equisetifolia*	
Casuarinaceae	*Allocasuarina lehmanniana*	Dune Sheoak
Chenopodiaceae	*Atriplex isatidea*	Coast Saltbush
Chenopodiaceae	*Rhagodia baccata* subsp*. baccata*	Berry Saltbush
Chenopodiaceae	*Rhagodia baccata* subsp*. dioica*	Sea Berry Saltbush
Chenopodiaceae	*Threlkeldia diffusa*	Coast Bonefruit
Convolvulaceae	**Cuscuta planiflora*	
Crassulaceae	**Aeonium arboreum*	
Crassulaceae	**Crassula alata*	
Crassulaceae	**Crassula glomerata*	
Crassulaceae	**Crassula thunbergiana*	
Cupressaceae	*Callitris preissii*	Rottnest Pine
Cyperaceae	**Ficinia marginata*	Coarse Club Rush
Cyperaceae	*Ficinia nodosa*	Knotted Club Rush
Cyperaceae	*Lepidosperma gladiatum*	Coast Sword-sedge
Ericaceae	*Leucopogon parviflorus*	Coast Beard-heath
Euphorbiaceae	**Euphorbia maculata*	
Euphorbiaceae	**Euphorbia paralias*	Sea Spurge
Euphorbiaceae	**Euphorbia peplus*	Petty Spurge
Euphorbiaceae	**Euphorbia terracina*	Geraldton Carnation Weed
Fabaceae	**Lupinus angustifolius*	Narrowleaf Lupin
Fabaceae	**Lupinus cosentinii*	
Fabaceae	**Medicago polymorpha*	Burr Medic
Fabaceae	**Trifolium campestre*	Hop Clover
Fabaceae	*Acacia cochlearis*	Rigid Wattle
Fabaceae	*Acacia cyclops*	Coastal Wattle
Fabaceae	*Acacia lasiocarpa*	Panjang
Fabaceae	*Acacia rostellifera*	Summer-scented Wattle
Fabaceae	*Acacia saligna*	Orange Wattle
Fabaceae	*Acacia truncata*	
Fabaceae	*Hardenbergia comptoniana*	Native Wisteria
Fabaceae	*Kennedia prostrata*	Scarlet Runner

Family	Species	Common Name
Fabaceae	*Templetonia retusa*	Cockies Tongues
Geraniaceae	**Erodium moschatum*	Musky Crowfoot
Geraniaceae	**Geranium molle*	Dove's Foot Cranesbill
Geraniaceae	**Pelargonium capitatum*	Rose Pelargonium
Goodeniaceae	*Scaevola anchusifolia*	Silky Scaevola
Goodeniaceae	*Scaevola canescens*	Grey Scaevola
Goodeniaceae	*Scaevola crassifolia*	Thick-leaved Fan-flower
Haemodoraceae	*Conostylis aculeata*	Prickly Conostylis
Haemodoraceae	*Conostylis candicans*	Grey Cottonhead
Iridaceae	**Romulea rosea*	Guildford Grass
Lamiaceae	*Hemiandra pungens*	Snakebush
Lauraceae	*Cassytha flava*	Dodder Laurel
Lauraceae	*Cassytha racemosa*	Dodder Laurel
Malvaceae	**Malva parviflora*	Marshmallow
Myrtaceae	*#Agonis flexuosa*	Peppermint
Myrtaceae	*#Eucalyptus* sp.	
Myrtaceae	*#Melaleuca nesophila*	Mindiyed
Myrtaceae	**Gaudium laevigatum*	Coast Teatree
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
Papaveraceae	**Fumaria capreolata*	Whiteflower Fumitory
Poaceae	**Ammophila arenaria*	Marram Grass
Poaceae	**Avena barbata*	Bearded Oat
Poaceae	**Bromus diandrus*	Great Brome
Poaceae	**Catapodium rigidum*	Rigid Fescue
Poaceae	**Cynodon dactylon*	Couch

Family	Species	Common Name
Poaceae	**Ehrharta calycina*	Perennial Veldt Grass
Poaceae	**Ehrharta longiflora*	Annual Veldt Grass
Poaceae	**Hordeum leporinum*	Barley Grass
Poaceae	**Lagurus ovatus*	Hare's Tail Grass
Poaceae	**Lolium perenne*	Perennial Ryegrass
Poaceae	**Lolium perenne × rigidum*	
Poaceae	**Lolium rigidum*	Wimmera Ryegrass
Poaceae	**Parapholis incurva*	Coast Barbgrass
Poaceae	**Thinopyrum distichum*	
Poaceae	**Vulpia bromoides*	Squirrel Tail Fescue
Poaceae	**Vulpia myuros*	Rat's Tail Fescue
Poaceae	*Spinifex hirsutus*	Hairy Spinifex
Poaceae	*Spinifex longifolius*	Beach Spinifex
Primulaceae	**Lysimachia arvensis*	Pimpernel
Proteaceae	*Grevillea crithmifolia*	
Ranunculaceae	*Clematis linearifolia*	Slender Clematis
Rhamnaceae	*Spyridium globulosum*	Basket Bush
Rubiaceae	**Galium murale*	Small Goosegrass
Santalaceae	*Exocarpos sparteus*	Broom Ballart
Santalaceae	*Santalum acuminatum*	Quandong
Scrophulariaceae	**Dischisma arenarium*	
Scrophulariaceae	*Myoporum insulare*	Blueberry Tree
Solanaceae	*Anthocercis littorea*	Yellow Tailflower
Urticaceae	*Parietaria debilis*	Pellitory

Appendix 5: Quadrat Data

Quadrat No.:	TRIGNA01
Survey Date:	30/10/2025
Easting:	382100
Northing:	6471802
Topography:	Dune crest
Aspect:	West
Slope:	1-3 %
Soil:	White sand
Gravel:	0 %
Rock:	0 %
Leaf Litter:	3 %
Bare Ground:	30 %
Drainage:	Well
Condition:	Degraded



Notes: A shrubland of *Olearia axillaris* with a grassland of **Ammophila arenaria* over *Carpobrotus virescens*. Within the primary dune system adjacent to the beach.

Species	Cover (%)	Height (m)
**Ammophila arenaria*	25.00	2.00
**Catapodium rigidum*	2.00	0.50
**Crassula glomerata*	0.50	0.02
**Sonchus oleraceus*	0.50	0.20
**Tetragonia decumbens*	2.00	0.50
**Trachyandra divaricata*	1.00	0.40
Carpobrotus virescens	0.50	0.35
Ficinia nodosa	1.00	0.60
Olearia axillaris	25.00	0.80
Rhagodia baccata subsp. *baccata*	1.00	0.70
Rhagodia baccata subsp. *dioica*	1.00	0.80
Senecio pinnatifolius	0.50	0.15
Spinifex longifolius	1.00	0.80
Threlkeldia diffusa	2.00	0.30

Note: *denotes introduced species.

Quadrat No.:	**TRIGNA02**
Survey Date:	30/10/2025
Easting:	382145
Northing:	6471798
Topography:	Dune swale
Aspect:	West
Slope:	1-3 %
Soil:	White sand
Gravel:	0 %
Rock:	9 %
Leaf Litter:	10 %
Bare Ground:	30 %
Drainage:	Well
Condition:	Good



Notes: A shrubland of *Olearia axillaris*, *Scaevola crassifolia*, and *Rhagodia baccata* shrubland over open heathland of *Acanthocarpus preissii* and open tussock grasses of *Spinifex longifolius*. Within the dune swale between the primary and secondary dune system.

Species	**Cover (%)**	**Height (m)**
**Asphodelus fistulosus*	0.50	0.20
**Catapodium rigidum*	10.00	0.30
**Crassula glomerata*	0.50	0.02
**Crassula thunbergiana*	0.50	0.02
**Cuscuta planiflora*	0.50	0.15
**Lolium perenne* × *rigidum*	0.50	0.10
**Pelargonium capitatum*	0.50	0.05
**Tetragonia decumbens*	1.00	0.40
**Trachyandra divaricata*	0.50	0.02
Acanthocarpus preissii	2.00	0.80
Ficinia nodosa	1.00	0.80
Leucophyta brownii	0.50	0.30
Olearia axillaris	25.00	0.80
Rhagodia baccata subsp. *dioica*	0.50	0.80
Scaevola crassifolia	20.00	0.60
Senecio pinnatifolius	0.50	0.20
Spinifex longifolius	3.00	0.30

Species	Cover (%)	Height (m)
Threlkeldia diffusa	1.00	0.25

Note: *denotes introduced species.

Quadrat No.:	**TRIGNA03**
Survey Date:	30/10/2025
Easting:	382186
Northing:	6471782
Topography:	Dune slope
Aspect:	West
Slope:	20-45 %
Soil:	White sand
Gravel:	0 %
Rock:	0 %
Leaf Litter:	5 %
Bare Ground:	30 %
Drainage:	Well
Condition:	Very Good



Notes: A shrubland of Olearia *axillaris, Myoporum insulare* and *Spyridium globulosum* over sedgeland of *Lepidosperma gladiatum.* Along the secondary dune system.

Species	**Cover (%)**	**Height (m)**
**Avena barbata*	0.50	0.80
**Bromus diandrus*	3.00	0.40
**Catapodium rigidum*	10.00	0.80
**Crassula glomerata*	4.00	0.02
**Dischisma arenarium*	0.50	0.10
**Euphorbia terracina*	3.00	0.40
**Ficinia marginata*	0.50	0.02
**Lagurus ovatus*	0.50	0.30
**Lolium perenne × rigidum*	0.50	0.20
**Medicago polymorpha*	0.50	0.20
**Oenothera drummondii*	0.50	0.05
**Pelargonium capitatum*	0.50	0.40
**Sonchus oleraceus*	0.10	0.15
**Trachyandra divaricata*	0.50	0.30
**Urospermum picroides*	0.50	0.05
Acacia cyclops	4.00	1.40
Acacia saligna	0.50	0.80

Species	Cover (%)	Height (m)
Acanthocarpus preissii	2.00	0.20
Ficinia nodosa	8.00	0.60
Lepidosperma gladiatum	12.00	1.40
Olearia axillaris	15.00	1.60
Scaevola crassifolia	0.10	0.10
Senecio pinnatifolius	8.00	0.30
Spinifex longifolius	3.00	0.40

Note: *denotes introduced species.

Quadrat No.:	**TRIGNA04**
Survey Date:	30/10/2025
Easting:	382209
Northing:	6471645
Topography:	Dune slope
Aspect:	West
Slope:	10-20 %
Soil:	White sand
Gravel:	0 %
Rock:	0 %
Leaf Litter:	8 %
Bare Ground:	10 %
Drainage:	Well
Condition:	Good



Notes: A shrubland of Olearia *axillaris, Myoporum insulare* and *Spyridium globulosum* over sedgeland of *Lepidosperma gladiatum.* Along the secondary dune system.

Species	**Cover (%)**	**Height (m)**
**Asphodelus fistulosus*	0.50	0.40
**Avena barbata*	0.50	0.60
**Bromus diandrus*	4.00	0.40
**Catapodium rigidum*	8.00	0.30
**Crassula glomerata*	0.50	0.05
**Euphorbia terracina*	1.00	0.40
**Ficinia marginata*	1.00	0.50
**Fumaria capreolata*	0.50	0.30
**Geranium molle*	0.50	0.05
**Lagurus ovatus*	1.00	0.25
**Pelargonium capitatum*	4.00	0.40
**Sonchus oleraceus*	0.50	0.10
**Trachyandra divaricata*	2.00	0.20
Acanthocarpus preissii	5.00	0.60
Carpobrotus virescens	3.00	0.25
Lepidosperma gladiatum	5.00	1.20
Myoporum insulare	2.00	1.00

Species	Cover (%)	Height (m)
Olearia axillaris	4.00	1.40
Rhagodia baccata subsp*. dioica*	2.00	0.50
Scaevola crassifolia	50.00	0.80
Senecio pinnatifolius	0.50	0.35
Spinifex longifolius	1.00	0.50
Threlkeldia diffusa	0.50	0.30

Note: *denotes introduced species.

Quadrat No.:	**TRIGNA05**
Survey Date:	30/10/2025
Easting:	382129
Northing:	6471655
Topography:	Dune crest
Aspect:	West
Slope:	1-3 %
Soil:	White sand
Gravel:	0 %
Rock:	0 %
Leaf Litter:	2 %
Bare Ground:	40 %
Drainage:	Well
Condition:	Good



Notes: A shrubland of *Olearia axillaris* with a grassland of **Ammophila arenaria* over *Carpobrotus virescens*. Within the primary dune system adjacent to the beach.

Species	**Cover (%)**	**Height (m)**
**Ammophila arenaria*	8.00	1.20
**Asphodelus fistulosus*	0.50	0.30
**Catapodium rigidum*	0.50	0.25
**Crassula glomerata*	0.50	0.02
**Parapholis incurva*	0.50	0.05
**Pelargonium capitatum*	2.00	0.30
**Sonchus oleraceus*	0.50	0.15
**Tetragonia decumbens*	10.00	0.80
**Trachyandra divaricata*	4.00	0.30
Carpobrotus virescens	5.00	0.25
Olearia axillaris	6.00	0.50
Senecio pinnatifolius	0.50	0.20
Spinifex longifolius	12.00	0.60

Note: *denotes introduced species.

Quadrat No.:	**TRIGNA06**
Survey Date:	30/10/2025
Easting:	382173
Northing:	6471531
Topography:	Dune swale
Aspect:	Northwest
Slope:	1-3 %
Soil:	White sand
Gravel:	0 %
Rock:	0 %
Leaf Litter:	4 %
Bare Ground:	25 %
Drainage:	Well
Condition:	Good



Notes: A shrubland of *Olearia axillaris*, *Scaevola crassifolia*, and *Rhagodia baccata* shrubland over open heathland of *Acanthocarpus preissii* and open tussock grasses of *Spinifex longifolius*. Within the dune swale between the primary and secondary dune system.

Species	**Cover (%)**	**Height (m)**
**Bromus diandrus*	2.00	0.40
**Catapodium rigidum*	5.00	0.35
**Crassula glomerata*	1.00	0.02
**Crassula thunbergiana*	0.50	0.02
**Cuscuta planiflora*	0.50	0.05
**Pelargonium capitatum*	0.50	0.30
**Sonchus oleraceus*	0.50	0.25
**Tetragonia decumbens*	8.00	1.00
**Trachyandra divaricata*	5.00	0.30
Carpobrotus virescens	2.00	0.20
Olearia axillaris	15.00	1.20
Rhagodia baccata subsp. *dioica*	2.00	0.80
Scaevola crassifolia	20.00	1.00
Senecio pinnatifolius	0.50	0.20
Spinifex longifolius	1.00	0.50
Threlkeldia diffusa	2.00	0.25

Note: *denotes introduced species.

Quadrat No.:	**TRIGNA07**
Survey Date:	30/10/2025
Easting:	382195
Northing:	6471326
Topography:	Dune crest
Aspect:	East
Slope:	20-45 %
Soil:	White sand
Gravel:	0 %
Rock:	0 %
Leaf Litter:	2 %
Bare Ground:	15 %
Drainage:	Well
Condition:	Degraded



Notes: A shrubland of *Olearia axillaris* with a grassland of **Ammophila arenaria* over *Carpobrotus virescens*. Within the primary dune system adjacent to the beach. Revegetation plantings present.

Species	**Cover (%)**	**Height (m)**
**Ammophila arenaria*	40.00	2.00
**Catapodium rigidum*	0.50	0.25
**Crassula glomerata*	0.50	0.05
**Pelargonium capitatum*	1.00	0.40
**Reichardia tingitana*	1.00	0.15
**Sonchus oleraceus*	1.00	0.10
**Tetragonia decumbens*	3.00	0.40
**Trachyandra divaricata*	1.00	0.25
Acanthocarpus preissii	0.50	0.05
Carpobrotus virescens	3.00	0.20
Ficinia nodosa	0.50	0.60
Leucophyta brownii	0.50	0.20
Olearia axillaris	5.00	0.80
Rhagodia baccata subsp. *baccata*	1.00	0.40
Rhagodia baccata subsp. *dioica*	2.00	0.40
Senecio pinnatifolius	0.50	0.30
Spinifex longifolius	0.50	0.30

Species	Cover (%)	Height (m)
Threlkeldia diffusa	3.00	0.30

Note: *denotes introduced species.

Quadrat No.:	**TRIGNA08**
Survey Date:	30/10/2025
Easting:	382323
Northing:	6471196
Topography:	Dune slope
Aspect:	East
Slope:	3-5 %
Soil:	White sand
Gravel:	0 %
Rock:	0 %
Leaf Litter:	2 %
Bare Ground:	10 %
Drainage:	Well
Condition:	Very Good



Notes: A shrubland of Olearia *axillaris, Myoporum insulare* and *Spyridium globulosum* over sedgeland of *Lepidosperma gladiatum.* Along the secondary dune system.

Species	**Cover (%)**	**Height (m)**
**Asphodelus fistulosus*	1.00	0.30
**Avena barbata*	0.50	0.60
**Bromus diandrus*	2.00	0.40
**Catapodium rigidum*	5.00	0.30
**Crassula glomerata*	0.50	0.02
**Crassula thunbergiana*	0.50	0.02
**Cuscuta planiflora*	0.50	0.10
**Ehrharta calycina*	1.00	0.40
**Euphorbia terracina*	1.00	0.40
**Geranium molle*	0.50	0.05
**Oenothera drummondii*	0.50	0.05
**Pelargonium capitatum*	1.00	0.80
**Reichardia tingitana*	0.50	0.15
**Trachyandra divaricata*	0.50	0.30
Acanthocarpus preissii	2.00	0.80
Exocarpos sparteus	1.00	2.00
Lepidosperma gladiatum	10.00	1.00

Species	Cover (%)	Height (m)
Myoporum insulare	1.00	1.60
Olearia axillaris	4.00	1.60
Rhagodia baccata subsp*. baccata*	1.00	0.30
Rhagodia baccata subsp*. dioica*	2.00	1.00
Scaevola crassifolia	50.00	0.80
Senecio pinnatifolius	1.00	0.20
Spinifex longifolius	1.00	0.60

Note: *denotes introduced species.

Quadrat No.:	TRIGNA09
Survey Date:	30/10/2025
Easting:	382203
Northing:	6471424
Topography:	Dune swale
Aspect:	East
Slope:	5-10 %
Soil:	White sand
Gravel:	0 %
Rock:	0 %
Leaf Litter:	20 %
Bare Ground:	20 %
Drainage:	Well
Condition:	Good



Notes: A shrubland of *Olearia axillaris*, *Scaevola crassifolia*, and *Rhagodia baccata* shrubland over open heathland of *Acanthocarpus preissii* and open tussock grasses of *Spinifex longifolius*. Within the dune swale between the primary and secondary dune system.

Species	Cover (%)	Height (m)
**Ammophila arenaria*	4.00	1.80
**Bromus diandrus*	2.00	0.30
**Catapodium rigidum*	8.00	0.30
**Crassula glomerata*	0.50	0.02
**Cuscuta planiflora*	1.00	0.10
**Lagurus ovatus*	0.50	0.15
**Pelargonium capitatum*	1.00	0.40
**Reichardia tingitana*	0.50	0.25
**Sonchus oleraceus*	0.50	0.20
**Tetragonia decumbens*	1.00	0.40
**Trachyandra divaricata*	3.00	0.30
Carpobrotus virescens	5.00	0.20
Hardenbergia comptoniana	0.50	0.40
Olearia axillaris	3.00	1.00
Rhagodia baccata subsp. *dioica*	1.00	0.40
Scaevola crassifolia	20.00	0.60
Senecio pinnatifolius	1.00	0.30

Species	Cover (%)	Height (m)
Spinifex longifolius	1.00	0.40
Threlkeldia diffusa	1.00	0.25

Note: *denotes introduced species.

Quadrat No.:	TRIGNA10
Survey Date:	31/10/2025
Easting:	382293
Northing:	6471330
Topography:	Dune slope
Aspect:	Northwest
Slope:	20-45 %
Soil:	White sand
Gravel:	0 %
Rock:	0 %
Leaf Litter:	40 %
Bare Ground:	2 %
Drainage:	Moderate
Condition:	Very Good



Notes: A shrubland of *Callitris preissii*, *Myoporum insulare*, and *Spyridium globulosum* over a sedgeland of *Lepidosperma gladiatum*. This vegetation type was recorded within the secondary dune system within OaMiSgSLgS. Dead *Callitris preissii.*

Species	Cover (%)	Height (m)
**Asphodelus fistulosus*	0.50	0.40
**Bromus diandrus*	5.00	0.30
**Catapodium rigidum*	1.00	0.25
**Crassula glomerata*	0.50	0.10
**Dischisma arenarium*	0.50	0.60
**Ehrharta calycina*	0.50	0.40
**Ehrharta longiflora*	2.00	0.05
**Euphorbia peplus*	1.00	0.60
**Euphorbia terracina*	1.00	1.80
**Fumaria capreolata*	0.50	0.02
**Galium murale*	0.50	0.02
**Geranium molle*	0.50	0.40
**Lagurus ovatus*	0.50	0.20
**Lysimachia arvensis*	0.50	0.02
**Pelargonium capitatum*	1.00	0.40
**Sonchus oleraceus*	0.50	0.20
**Trachyandra divaricata*	1.00	0.30

Species	Cover (%)	Height (m)
Acanthocarpus preissii	1.00	0.60
Callitris preissii	4.00	1.20
Cassytha racemosa	0.50	0.02
Exocarpos sparteus	0.50	0.30
Lepidosperma gladiatum	30.00	1.40
Myoporum insulare	1.00	1.80
Parietaria debilis	0.50	0.40
Rhagodia baccata subsp*. baccata*	5.00	0.80
Rhagodia baccata subsp*. dioica*	1.00	1.00
Scaevola crassifolia	2.00	1.20
Senecio pinnatifolius	0.50	0.30
Spyridium globulosum	3.00	1.80
Threlkeldia diffusa	10.00	1.20

Note: *denotes introduced species.

Quadrat No.:	**TRIGNA11**
Survey Date:	31/10/2025
Easting:	382345
Northing:	6471373
Topography:	Dune slope
Aspect:	North
Slope:	10-20 %
Soil:	White sand
Gravel:	0 %
Rock:	0 %
Leaf Litter:	20 %
Bare Ground:	1 %
Drainage:	Moderate
Condition:	Very Good



Notes: A shrubland of *Callitris preissii*, *Myoporum insulare*, and *Spyridium globulosum* over a sedgeland of *Lepidosperma gladiatum*. This vegetation type was recorded within the secondary dune system within OaMiSgSLgS.

Species	**Cover (%)**	**Height (m)**
**Ehrharta longiflora*	0.50	0.40
**Fumaria capreolata*	50.00	2.00
**Oxalis pes-caprae*	0.50	0.30
**Sonchus oleraceus*	0.50	0.40
Acanthocarpus preissii	0.50	0.40
Callitris preissii	80.00	3.00
Lepidosperma gladiatum	60.00	1.60
Myoporum insulare	15.00	3.00
Parietaria debilis	1.00	0.40
Rhagodia baccata subsp. *baccata*	5.00	1.00

Note: *denotes introduced species.

Quadrat No.:	TRIGNA12
Survey Date:	31/10/2025
Easting:	382337
Northing:	6471318
Topography:	Dune crest
Aspect:	North
Slope:	10-20 %
Soil:	White sand
Gravel:	0 %
Rock:	0 %
Leaf Litter:	20 %
Bare Ground:	2 %
Drainage:	Moderate
Condition:	Good



Notes: A shrubland of *Callitris preissii*, *Myoporum insulare*, and *Spyridium globulosum* over a sedgeland of *Lepidosperma gladiatum*. This vegetation type was recorded within the secondary dune system within OaMiSgSLgS. High densities of rubbish recorded.

Species	Cover (%)	Height (m)
**Asphodelus fistulosus*	5.00	0.50
**Bromus diandrus*	0.50	0.40
**Catapodium rigidum*	1.00	0.40
**Crassula glomerata*	0.50	0.02
**Ehrharta longiflora*	0.50	0.15
**Euphorbia peplus*	0.50	0.05
**Euphorbia terracina*	1.00	0.30
**Ficinia marginata*	1.00	0.02
**Fumaria capreolata*	15.00	0.40
**Oxalis pes-caprae*	0.50	0.30
**Pelargonium capitatum*	1.00	0.40
**Sonchus oleraceus*	1.00	0.20
**Trachyandra divaricata*	1.00	0.40
Acacia cyclops	1.00	3.00
Acanthocarpus preissii	3.00	0.40
Callitris preissii	0.50	0.35
Cassytha racemosa	50.00	3.00

Species	Cover (%)	Height (m)
Clematis linearifolia	0.50	0.40
Hardenbergia comptoniana	2.00	0.80
Lepidosperma gladiatum	30.00	0.80
Parietaria debilis	2.00	0.40
Rhagodia baccata subsp*. baccata*	0.50	1.20
Rhagodia baccata subsp*. dioica*	1.00	1.00
Santalum acuminatum	1.00	1.20
Scaevola crassifolia	2.00	0.40
Senecio pinnatifolius	0.50	0.35
Spyridium globulosum	1.00	0.60
Threlkeldia diffusa	3.00	0.50

Note: *denotes introduced species.

Appendix 6: Floristic Analysis Data

Quadrat	Single Site Insertion against Keighery *et al*. (2012)			Single Site Insertion against Gibson *et al*. (1994)		
	Dendrogram	Similarity	Potential FCT	Dendrogram	Similarity	Potential FCT
TRIGNA01	s14	MI13 (s14, 43 %) MI15 (s14, 43 %) MI16 (s14, 43 %)	s14	29a	NAVB-2 (29a, 26 %) BURN-2 (29a, 25 %) PRES-1 (29a, 19 %)	29a
TRIGNA02	s14	MI16 (s14, 67 %) MI15 (s14, 53 %) MI12 (s13, 48 %)	s13 /s14	29a	NAVB-2 (29a, 30 %) PRES-1 (29a, 26 %) BURN-1 (29a, 24 %)	29a
TRIGNA03	s13/s14	MI10 (s14, 57 %) MI16 (s14, 53 %) MI11 (s13, 50 %)	s13 /s14	19a/19b/24	BURN-1 (29a, 24 %) BURN-2 (29a, 23 %) cool 09 (19b, 23 %)	19a/19b/24/29a
TRIGNA04	s13/s14	MI12 (s13, 54 %) MI10 (s14, 53 %) MI19 (s13, 50 %)	s13 /s14	29a	PRES-1 (29a, 25 %) SEAB-8 (29a, 24 %) NAVB-2 (29a, 24 %)	29a
TRIGNA05	s14	MI13 (s14, 60 %) MI10 (s14, 44 %) MI15 (s14, 40 %)	s14	Inconclusive	BURN-2 (29a, 19 %) PB-4 (29b, 13 %) SEAB-7 (29b, 12 %)	29a/29b
TRIGNA06	s14	MI10 (s14, 50 %) MI13 (s14, 46 %) MI16 (s14, 46 %)	s14	29a	PRES-1 (29a, 29 %) BURN-2 (29a, 25 %) NAVB-2 (29a, 19 %)	29a
TRIGNA07	s14	MI15 (s14, 50 %) MI16 (s14, 50 %) MI12 (s13, 46 %)	s13 /s14	29a	NAVB-2 (29b, 30 %) BURN-2 (29a, 23 %) PB-4 (29a, 22 %)	29a/29b
TRIGNA08	s13/s14	MI10 (s14, 53 %) MI19 (s14, 50 %)	s13 /s14	29a	PB-3 (29b, 27 %) BURN-1 (29a, 24 %)	29a/29b

Quadrat	Single Site Insertion against Keighery *et al*. (2012)			Single Site Insertion against Gibson *et al*. (1994)		
	Dendrogram	Similarity	Potential FCT	Dendrogram	Similarity	Potential FCT
		MI12 (s14, 46 %)			SEAB-8 (29a, 20 %)	
TRIGNA09	s14	MI10 (s14, 62 %) MI13 (s14, 43 %) MI16 (s14, 43 %)	s14	29a	BURN-2 (29a, 32 %) PRES-1 (29a, 27 %) BURN-1 (29a, 24 %)	29a
TRIGNA10	29a/s14/s13	MI19 (s13, 42 %) MI12 (s13, 34 %) MI11 (s13, 33 %)	s13 /s14 /29a	29a	GARDEN-1 (30a, 37 %) PRES-1 (29a, 31 %) PEPGRV-2 (30a, 30 %)	29a/30a
TRIGNA11	s11/s19/30a2/30a1	MI08 (s11, 33 %) MI19 (s13, 33 %) SW03 (s13, 33 %)	s11/s13/s19/30a	30a	GARDEN-1 (30a, 38 %) TRIG-2 (29a, 29 %) GARDEN-3 (30a, 26 %)	29a/30a
TRIGNA12	29a/s14/s13/s11	TR03 (s13, 40 %) MI11 (s13, 38 %) SW04 (s13, 36 %)	s11/s13/s14/29a	29a/30a	TRIG-2 (29a, 41 %) GARDEN-4 (30a, 40 %) BURN-1 (29a, 36 %)	29a/30a

Appendix 7: Declared Pest Legal Status and Control Categories

Legal status of organisms as listed under the *Biosecurity and Agriculture Management Act 2007* (WA)

Legal Status	Definition
Permitted - s11	Organisms that are allowed entry into WA.
Declared Pest, Prohibited - s12	Organisms that are prohibited from entry into WA. Where there are reasonable grounds that the organism may have adverse effect on: i. another organism ii. human beings iii. the environment or part of the environment iv. agricultural activities, fishing or pearling activities, or related commercial activities, carried on or intended to be carried on, in the State or part of the State. Or it may have an adverse effect on any of those things if it were present in the State or part of the State, or if it were present in the State or the part in greater numbers or to a greater extent.
Declared Pest - s22(2)	Organisms that are present in WA and are under a control category. Where there are reasonable grounds that the organism may have adverse effect on: i. another organism in the area ii. human beings in the area iii. the environment or part of the environment in the area iv. agricultural activities, fishing or pearling activities, or related commercial activities, carried on or intended to be carried on, in the State or part of the State in the area. Or it may have an adverse effect on any of those things if it were present in the area, or if it were present in the area in greater numbers or to a greater extent.
Permitted, Requires Permit - r73	Organisms may only be imported subject to an import permit. These organisms may be subject to restriction under legislation other than the *Biosecurity and Agriculture Management Act 2007*. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.
Unlisted - s14	Is not a permitted organism or a declared pest. Unlisted organisms are automatically prohibited entry into Western Australia.

Declared pests listed under the *Biosecurity and Agriculture Management Act 2007* (WA) under section 22 (2) are subjected to control categories listed under the Biosecurity and Agriculture Management Regulations 2013 (WA).

Control Category	Definition
C1 Exclusion	If in the opinion of the Minister introduction of the declared pest into an area or part of an area for which it is declared should be prevented;
C2 Eradication	If in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is feasible;
C3 Management	If in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is not feasible but that it is necessary to i. alleviate the harmful impact of the declared pest in the area ii. reduce the number or distribution of the declared pest in the area iii. prevent or contain the spread of the declared pest in the area.
Unassigned	Declared pests that are recognised as having a harmful impact under certain circumstances, where their subsequent control requirements are determined by a Plan or other legislative arrangements under the Act.

Appendix 8: Weed Species Prioritisation and Treatment

Family	Species	Common Name	Ecological Impact^	Invasiveness^^	Treatment Type	Treatment Time
Aizoaceae	**Carpobrotus edulis*	Hottentot Fig	H	R	1 or 6	Jun - Oct
Aizoaceae	**Carpobrotus edulis* x *virescens*		L	S	1 or 6	Jun - Oct
Aizoaceae	**Tetragonia decumbens*	Sea Spinach	H	R	1	Mar - Nov
Araucariaceae	**Araucaria heterophylla*		-	-	5	Jan - Dec
Asparagaceae	**Ornithogalum arabicum*	Lesser Cape Lily	-	-	3 or 4	Aug - Dec.
Asphodelaceae	**Asphodelus fistulosus*	Onion Weed	U	R	3	Jul - Oct
Asphodelaceae	**Trachyandra divaricata*		M	R	3, 4 or 6	Jun - Sept
Asteraceae	**Arctotheca calendula*	Cape Weed	H	R	1	Jun - Nov
Asteraceae	**Erigeron bonariensis*		L	M	1, 4 or 6	Jun - Sep
Asteraceae	**Erigeron sumatrensis*		M	R	1, 4 or 6	Jun - Nov
Asteraceae	**Gazania linearis*		H	R	1 or 6	Jun - Nov
Asteraceae	**Osteospermum ecklonis*		U	M	1 or 6	Oct - Mar
Asteraceae	**Reichardia tingitana*	False Sowthistle	U	U	1 or 6	Aug - Oct
Asteraceae	**Sonchus oleraceus*	Common Sowthistle	U	R	1 or 6	Jun - Aug
Asteraceae	**Urospermum picroides*	False Hawkbit	M	R	1	Aug - Oct
Brassicaceae	**Brassica tournefortii*	Mediterranean Turnip	H	R	1	Jun - Nov
Brassicaceae	**Cakile maritima*	Sea Rocket	U	R	1, 4 or 6	Jun - Nov
Brassicaceae	**Lobularia maritima*	Sweet Alyssum	L	M	1 or 6	Jun - Nov

Family	Species	Common Name	Ecological Impact^	Invasiveness^^	Treatment Type	Treatment Time
Brassicaceae	**Matthiola incana*	Common Stock	U	S	1 or 6	Jun - Nov
Brassicaceae	**Raphanus raphanistrum*	Wild Radish	U	M	1 or 6	Jun - Nov
Caryophyllaceae	**Cerastium balearicum*		L	R	1	Feb - Dec
Casuarinaceae	**Casuarina equisetifolia*		U	S	5	Jan - Dec
Convolvulaceae	**Cuscuta planiflora*		U	U	1 or 6	Jun - Sep
Crassulaceae	**Aeonium arboreum*		L	S	1 or 6	Jul - Sep
Crassulaceae	**Crassula alata*		L	M	1	Jul - Sep
Crassulaceae	**Crassula glomerata*		U	R	1	Aug - Nov
Crassulaceae	**Crassula thunbergiana*		L	S	1	Jul - Sep
Cyperaceae	**Ficinia marginata*	Coarse Club Rush	U	U	1 or 6	Jun - Aug
Euphorbiaceae	**Euphorbia maculata*		-	-	1	Nov - Dec
Euphorbiaceae	**Euphorbia paralias*	Sea Spurge	U	M	1, 3 or 6	Sep - Jan
Euphorbiaceae	**Euphorbia peplus*	Petty Spurge	U	M	1 or 3	Jun - Sep
Euphorbiaceae	**Euphorbia terracina*	Geraldton Carnation Weed	H	R	1 or 6	Jun - Aug
Fabaceae	**Lupinus angustifolius*	Narrowleaf Lupin	H	M	1, 3 or 6	Jul - Sep
Fabaceae	**Lupinus cosentinii*		H	M	1, 3 or 6	Jun - Sep
Fabaceae	**Medicago polymorpha*	Burr Medic	U	R	1, 3 or 6	Jun - Aug
Fabaceae	**Trifolium campestre*	Hop Clover	U	U	1	Jun - Sep
Geraniaceae	**Erodium moschatum*	Musky Crowfoot	L	S	1	Aug - Oct
Geraniaceae	**Geranium molle*	Dove's Foot Cranesbill	L	M	1	Sep-Oct

Family	Species	Common Name	Ecological Impact^	Invasiveness^^	Treatment Type	Treatment Time
Geraniaceae	**Pelargonium capitatum*	Rose Pelargonium	H	R	3 or 6	Jun - Oct
Iridaceae	**Romulea rosea*	Guildford Grass	U	R	3	Jul - Aug
Malvaceae	**Malva parviflora*	Marshmallow	L	U	1 or 6	Apr - Jun
Myrtaceae	*#Agonis flexuosa*	Peppermint	-	-	5	Jan - Dec
Myrtaceae	*#Eucalyptus* sp.		-	-	5	Jan - Dec
Myrtaceae	*#Melaleuca nesophila*	Mindiyed	U	M	5	Jan - Dec
Myrtaceae	**Gaudium laevigatum*	Coast Teatree	H	R	1, 5 or 6	Jan - Dec
Onagraceae	**Oenothera drummondii*	Beach Evening Primrose	U	R	3 or 6	Jul - Oct
Oxalidaceae	**Oxalis pes-caprae*	Soursob	H	S	1 or 3	Jun - Jul
Papaveraceae	**Fumaria capreolata*	Whiteflower Fumitory	H	R	1 or 3	Jul - Sep
Poaceae	**Ammophila arenaria*	Marram Grass	H	S	1 or 6	Sep - Nov
Poaceae	**Avena barbata*	Bearded Oat	H	R	2	Jul - Oct
Poaceae	**Bromus diandrus*	Great Brome	H	R	1 or 2	Jul - Oct
Poaceae	**Catapodium rigidum*	Rigid Fescue	U	M	1 or 2	Jul - Oct
Poaceae	**Cynodon dactylon*	Couch	H	R	1 or 2	Mar - Apr
Poaceae	**Ehrharta calycina*	Perrenial Veldt	H	R	2 or 6	Jun - Aug
Poaceae	**Ehrharta longiflora*	Annual Veldt Grass	M	R	2 or 6	Aug - Oct
Poaceae	**Hordeum leporinum*	Barley Grass	H	U	2 or 6	Jun - Aug
Poaceae	**Lagurus ovatus*	Hare's Tail Grass	H	R	2 or 6	Jul - Dec
Poaceae	**Lolium perenne*	Perennial Ryegrass	H	R	1, 2 or 6	Jun - Oct

Family	Species	Common Name	Ecological Impact^	Invasiveness^^	Treatment Type	Treatment Time
Poaceae	**Lolium perenne* × *rigidum*		H	R	1, 2 or 6	Jun - Oct
Poaceae	**Lolium rigidum*	Wimmera Ryegrass	H	R	1, 2 or 6	Jun - Oct
Poaceae	**Parapholis incurva*	Coast Barbgrass	U	U	1, 2 or 6	Jul - Sep
Poaceae	**Thinopyrum distichum*		U	U	1 or 6	Jun - Oct
Poaceae	**Vulpia bromoides*	Squirrel Tail Fescue	H	R	2 or 6	Jul - Aug
Poaceae	**Vulpia myuros*	Rat's Tail Fescue	H	R	1 or 6	Jul - Sep
Primulaceae	**Lysimachia arvensis*	Pimpernel	U	R	1	Feb - Dec
Rubiaceae	**Galium murale*	Small Goosegrass	L	R	1	Jul - Nov
Scrophulariaceae	**Dischisma arenarium*		U	R	1	Jul - Sep

^*Note*. L= Low, M= Medium, H= High, U= Unknown.

^^*Note*. S= Slow, M= Moderate, R= Rapid, U= Unknown.

Appendix 9: Combined Weed Survey Species

Family	*Species*	2011[1]	2014[1]	2024[1]	2025
Aizoaceae	**Carpobrotus edulis*	X	X	X	X
Aizoaceae	**Carpobrotus edulis* x *virescens*				X
Aizoaceae	**Tetragonia decumbens*	X	X	X	X
Araucariaceae	**Araucaria heterophylla*				X
Asparagaceae	**Ornithogalum arabicum*				X
Asparagaceae	**Yucca aloifolia*	X			
Asphodelaceae	**Asphodelus fistulosus*	X			X
Asphodelaceae	**Trachyandra divaricata*	X	X	X	X
Asteraceae	**Arctotheca calendula*	X			X
Asteraceae	**Arctotis stoechadifolia*	X			
Asteraceae	**Bellis perennis*	X		X	
Asteraceae	**Erigeron bonariensis*		X	X	X
Asteraceae	**Erigeron sumatrensis*				X
Asteraceae	**Gazania linearis*	X	X		X
Asteraceae	**Gazania* spp.			X	
Asteraceae	**Hypochaeris radicata*			X	
Asteraceae	**Monoculus monstrosus*	X		X	
Asteraceae	**Osteospermum ecklonis*				X
Asteraceae	**Reichardia tingitana*				X
Asteraceae	**Senecio lautus^*			X	
Asteraceae	**Senecio vulgaris*	X	X	X	
Asteraceae	**Sonchus oleraceus*	X	X	X	X
Asteraceae	**Urospermum picroides*				X
Brassicaceae	**Brassica tournefortii*				X
Brassicaceae	**Cakile maritima*		X		X
Brassicaceae	**Lobularia maritima*			X	X
Brassicaceae	**Matthiola incana*	X			X
Brassicaceae	**Raphanus raphanistrum*	X	X	X	X
Caryophyllaceae	**Cerastium balearicum*				X
Casuarinaceae	**Casuarina equisetifolia*	X	X	X	X

Family	*Species*	2011[1]	2014[1]	2024[1]	2025
Convolvulaceae	**Cuscuta planiflora*				X
Crassulaceae	**Aeonium arboreum*				X
Crassulaceae	**Crassula alata*				X
Crassulaceae	**Crassula glomerata*				X
Crassulaceae	**Crassula thunbergiana*				X
Cyperaceae	**Ficinia marginata*				X
Euphorbiaceae	**Euphorbia lathyris*			X	
Euphorbiaceae	**Euphorbia maculata*				X
Euphorbiaceae	**Euphorbia paralias*		X	X	X
Euphorbiaceae	**Euphorbia peplus*				X
Euphorbiaceae	**Euphorbia terracina*	X	X	X	X
Euphorbiaceae	**Ricinus communis*		X		
Fabaceae	**Lupinus angustifolius*				X
Fabaceae	**Lupinus cosentinii*	X		X	X
Fabaceae	**Medicago polymorpha*				X
Fabaceae	**Trifolium campestre*				X
Geraniaceae	**Erodium moschatum*				X
Geraniaceae	**Erodium* sp.			X	
Geraniaceae	**Geranium molle*			X	X
Geraniaceae	**Pelargonium capitatum*	X	X	X	X
Iridaceae	**Ferraria crispa*	X			
Iridaceae	**Moraea* sp.	X			
Iridaceae	**Romulea rosea*				X
Malvaceae	**Malva parviflora*				X
Myrtaceae	*#Agonis flexuosa*	X		X	X
Myrtaceae	*#Eucalyptus* platypus		X	X	
Myrtaceae	*#Eucalyptus* sp.				X
Myrtaceae	*#Melaleuca nesophila*	X	X	X	X
Myrtaceae	**Gaudium laevigatum*				X
Onagraceae	**Oenothera drummondii*	X	X	X	X
Onagraceae	**Oenothera glazioviana*			X	
Oxalidaceae	**Oxalis pes-caprae*	X	X	X	X

Family	*Species*	2011[1]	2014[1]	2024[1]	2025
Papaveraceae	**Fumaria capreolata*	X		X	X
Poaceae	**Ammophila arenaria*	X	X	X	X
Poaceae	**Avena barbata*	X	X	X	X
Poaceae	**Avena fatua*	X	X	X	
Poaceae	**Bromus diandrus*			X	X
Poaceae	**Bromus* spp.	X	X		
Poaceae	**Catapodium rigidum*				X
Poaceae	**Cenchrus longisetus*		X		
Poaceae	**Cortaderia selloana*	X	X	X	
Poaceae	**Cynodon dactylon*	X	X	X	X
Poaceae	**Digitaria sanguinalis*			X	
Poaceae	**Ehrharta calycina*				X
Poaceae	**Ehrharta longiflora*			X	X
Poaceae	**Eragrostis curvula*	X	X	X	
Poaceae	**Hordeum leporinum*			X	X
Poaceae	**Lagurus ovatus*	X	X	X	X
Poaceae	**Lolium perenne*				X
Poaceae	**Lolium perenne × rigidum*				X
Poaceae	**Lolium rigidum*	X	X	X	X
Poaceae	**Parapholis incurva*				X
Poaceae	**Stenotaphrum secundatum*	X	X		
Poaceae	**Thinopyrum distichum*	X	X	X	X
Poaceae	**Vulpia bromoides*	X	X	X	X
Poaceae	**Vulpia myuros*	X	X	X	X
Poaceae	*Unidentified grasses*	X	X	X	
Primulaceae	**Lysimachia arvensis*	X	X	X	X
Ranunculaceae	**Ranunculus muricatus*			X	
Rubiaceae	**Galium murale*				X
Scrophulariaceae	**Dischisma arenarium*				X
Solanaceae	**Solanum nigrum*	X	X		

[1] Note. From *Re - Map of The City of Stirling Coastal Zone between South Trigg car park and north Scarborough car parks* (Fisher Research Pty Ltd, 2024).

^ Note. This species does not occur in Australia, but the name has been widely misapplied to species in the Lautusoid group. See I.R. Thompson in Fl.Australia 37:306 (2015) (Western Australian Herbarium, 1998-).