360 environmental | Part of SLR

Woodman Point

Reconnaissance Flora and Vegetation Survey

Prepared for

Department of Transport

August 2022

people • planet • professional

Document Reference	Revision	Prepared by	Reviewed by	Admin Review	Submitted to Client	
					Copies	Date
4413AA_Rev0	Internal Draft	N. Whittington P. Walker	S. Walker	-	1x electronic copies	30/03/2021
4413AA_Rev1	Client Draft	N. Whittington P. Walker	S. Walker	L. Ioannidis	1x electronic copies	30/03/2021
4413AA_Rev2	Client Draft	N. Whittington	S. Walker	L. Ioannidis	1x electronic copies	12/11/2021
4413AA_Rev3	Client Draft	N. Whittington	S. Walker	L. Ioannidis	1x electronic copies	05/08/2021
4413AA_Rev4	Client Final	N. Whittington	S. Walker	L. Ioannidis	1x electronic copies	16/08/2022

Disclaimer

This report is issued in accordance with, and is subject to, the terms of the contract between the Client and 360 Environmental Pty Ltd, including, without limitation, the agreed scope of the report. To the extent permitted by law, 360 Environmental Pty Ltd shall not be liable in contract, tort (including, without limitation, negligence) or otherwise for any use of, or reliance on, parts of this report without taking into account the report in its entirety and all previous and subsequent reports. 360 Environmental Pty Ltd considers the contents of this report to be current as at the date it was produced. This report, including each opinion, conclusion, and recommendation it contains, should be considered in the context of the report as a whole. The opinions, conclusions and recommendations in this report are limited by its agreed scope. More extensive, or different, investigation, sampling and testing may have produced different results and therefore different opinions, conclusions, and recommendations. Subject to the terms of the contract between the Client and 360 Environmental Pty Ltd, copying, reproducing, disclosing, or disseminating parts of this report is prohibited (except to the extent required by law) unless the report is produced in its entirety including this cover page, without the prior written consent of 360 Environmental Pty Ltd.

Executive Summary

The Department of Transport commissioned 360 Environmental Pty Ltd (360 Environmental) to undertake a reconnaissance flora and vegetation survey of the dune system adjacent to the proposed new location of the Woodman Point Ammo Jetty (the Survey Area). The Survey Area is located in Coogee, approximately 21.1 km southwest of Perth, in the Swan Coastal Plain bioregion of Western Australia. The Survey Area is 2.99 ha.

The desktop assessment identified 38 conservation significant species occurring within 15 km of the Survey Area. A pre-survey likelihood of occurrence assessment was undertaken and determined three species as having a high likelihood of occurrence, four species as having a medium likelihood of occurrence and 31 species as having a low likelihood of occurrence.

The reconnaissance flora and vegetation survey recorded the floristic composition and vegetation types from six relevés, mapping notes and opportunistic observations. A total of 40 taxa were recorded from 33 genera across 21 families.

No Threatened flora species pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* and/or gazetted as Threatened/Declared Rare Flora pursuant to the *Biodiversity and Conservation Ac*t 2016 were recorded during the survey.

One DBCA listed Priority flora was recorded; *Grevillea olivacea* (P4). The specimens found within the Survey Area are most likely planted and therefore not conservation significant. The presence of these species is unlikely to form a statutory constraint for the Survey Area and is dealt with by DWER and DBCA on a case-by-case basis.

A total of 18 introduced species were recorded within the Survey Area, representing 45.82% of the total taxa recorded. One species, **Asparagus asparagoides*, is listed as a Declared Pest by the State Department of Primary Industries and Regional Development and as a Weed of National Significance by the Department of Agriculture, Water and the Environment.

A total of nine vegetation types were mapped within the Survey Area and cover 2.52 ha. Within the 2.99 ha Survey Area, 0.40 ha was cleared. The natural weathering conditions has produced various vegetation densities depending on the position in the landscape i.e., swale versus dune. Historical clearing or disturbance between 1981 and 1983 has left some areas within the Survey Area devoid of vegetation. Other sources of disturbances within the Survey Area are weeds, litter, and trampling.

It can be conjectured that Threatened Ecological Community, Floristic Community Type (FCT) 30a2 - *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands, does occur within the Survey Area and represented by the vegetations types CpSg, MlAr, CpMl and Ml. These mapped vegetation types either have *Callitris preissii* and/or *Melaleuca lanceolata* present as well as other limited indicator species typical of FCT 30a2.

Abbreviations

Abbreviations used through the report are described below.

Abbreviation	Description
360 Environmental	360 Environmental Pty Ltd
BAM Act	Biosecurity and Agriculture Management Act 2007
BC Act	Biodiversity Conservation Act 2016
BoM	Bureau of Meteorology
°C	Degree Celsius
CR	Critically Endangered
DAWE	Department of Agriculture, Water, and the Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DoE	Department of Environment
DoT	Department of Transport
DP	Declared Pest
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	Environmental Protection Act 1986
EPA	Environmental Protection Authority
EPBC Act	Environment Protection Biodiversity and Conservation Act 1999
ESA	Environmentally Sensitive Area
GIS	Geographic Information System
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
km	Kilometres
m	Metres
mm	Millimetres
MNES	Matters of National Environmental Significance
NVIS	National Vegetation Information System
P	Priority
PEC	Priority Ecological Community
PMST	Protected Matters Search Tool
Study Area	The database search area (varied according to each parameter)
Survey Area	The Woodman Point Survey Area is approximately 21.1 km southwest of Perth, Western Australia
T	Threatened
TEC	Threatened Ecological Community
TPFL	Threatened and Priority Flora Database

Abbreviation	Description
VU	Vulnerable
WA	Western Australia
WAH	Western Australian Herbarium
WAM	Western Australian Museum
WoNS	Weeds of National Significance

Table of Contents

List of Tables

List of Plates

List of Graphs

List of Figures (out of text)

List of Appendices

1 Introduction

1.1 The Project

The Department of Transport commissioned 360 Environmental Pty Ltd (360 Environmental) to undertake a reconnaissance flora and vegetation survey of the dune system adjacent to the proposed new location of the Woodman Point Ammo Jetty (the Survey Area).

The Survey Area is located approximately 21.1 km southwest of Perth in the Swan Coastal Plain bioregion of Western Australia. The Survey Area is 2.99 ha (Figure 1).

1.2 Objectives and Scope

The purpose of the survey was to undertake a reconnaissance flora and vegetation survey and provide a report that will be used to inform the project.

The scope of works included:

- Undertake a comprehensive database review of the proposed Survey Area
- Clarify whether the area has the potential to support any significant flora or vegetation
- Opportunistically record:
  - Threatened flora listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
  - Threatened Flora listed under the WA *Biodiversity Conservation Act 2016* (BC Act)
  - Priority Flora recognised by DBCA
  - Potential TECs listed under the Commonwealth EPBC Act
  - Potential PECs recognised by DBCA
  - Declared weeds listed under the Biosecurity and Agriculture Management Act 2007 (BAM Act) and Weeds of National Significance (WoNS).
- Provide a description of the vegetation communities present within the Survey Area
- Map vegetation types and condition within the Survey Area
- Map locations of conservation significant flora within the Survey Area (if found)
- Describe vegetation condition in accordance with the Southwest Botanical Province vegetation condition scale
- Provide a report outlining key findings from the survey data collected during the field survey.

2 Background

2.1 Protection of Flora, Vegetation and Fauna

Western Australian flora is protected formally and informally by legislative and non-legislative measures:

Legislative measures:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- WA *Biodiversity Conservation Act 2016* (BC Act)
- WA *Environmental Protection Act 1986* (EP Act)
- WA *Biosecurity and Agriculture Management Act 2007* (BAM Act).

Non-legislative measures:

- WA Department of Biodiversity Conservation and Attractions (DBCA) Priority lists for flora and ecological communities
- Weeds of National Significance (WoNS)
- Recognition of locally significant populations by DBCA.

These protection mechanisms are supported by guidance documents published by the Environmental Protection Authority (EPA) and Department of Agriculture, Water and the Environment (DAWE):

- Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority, 2016)
- Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999 (Department of the Environment, 2013).

2.2 Existing Environment

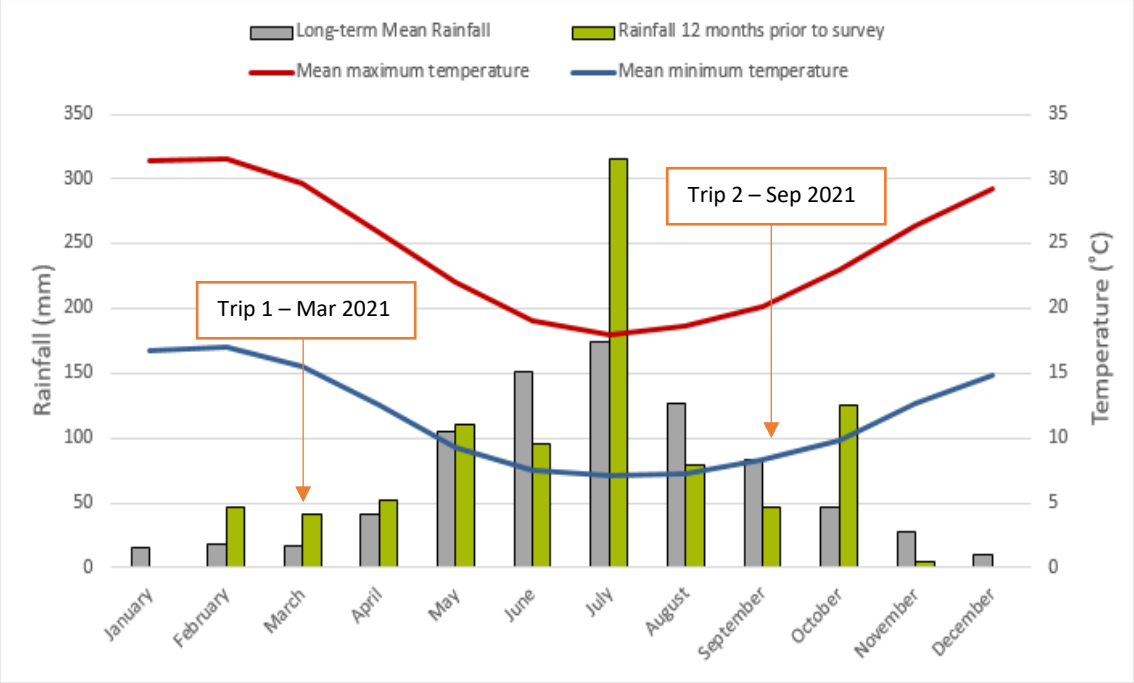
2.2.1 Climate

The closest long-term Bureau of Meteorology weather station with a complete dataset is Jandakot Airport (Station 9172), located approximately 11.8 km east of the Survey Area.

Climate statistics were calculated utilising data from the most current climate normal, which is defined as a 30 year interval (Bureau of Meteorology, 2007), where possible. A climate normal is a period long enough to include year-to-year variations while avoiding the influence of longer-term changes in climate (Bureau of Meteorology, 2007).

The long-term mean minimum temperature for Jandakot Aero ranges from 6.9˚C (July) to 17.1˚C (February) (1991 to 2020) and the long-term mean maximum temperature ranges from 18.1˚C (July) to 31.6˚C (February) (Graph 1) (Bureau of Meteorology, 2021). The long-term annual average rainfall is 775.4 millimetres (mm) (Bureau of Meteorology, 2021) (Graph 1).

The Jandakot Aero weather station recorded 701.4 mm of rainfall in the 12 months prior to the survey (March 2020 to February 2021), which is 74.0 mm below the long-term average (Bureau of Meteorology, 2021). In the three months prior to the survey (December 2020 to February 2021), 49.6 mm of rainfall was recorded, which is 4.6 mm above the long-term average of 45.0 mm for the same time period (Bureau of Meteorology, 2021).



Graph 1: Long term and Monthly Total Rainfall, Maximum and Minimum temperatures for Jandakot Aero (9172) (Bureau of Meteorology, 2021).

2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical, and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Department of the Environment and Energy, 2016). The Survey Area occurs within the Swan Coastal Plain bioregion and the Perth (SWA2) subregion.

The Perth subregion (SWA2) is characterised by colluvial and aeolian sands, alluvial river flats, coastal limestone. The subregion is represented by heath and/or Tuart woodlands on limestone, Banksia and Jarrah-Banksia woodlands on Quaternary marine dunes of various ages, and by Marri on colluvial and alluvials (Mitchell, Williams and Desmond, 2002).

2.2.3 Soil Landscapes and Land Systems

Soil landscapes and land system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales, ranging from 1:20,000 to 1:250,000 (Department of Agriculture and Food WA, 2012). The Survey Area occurs entirely within the Quindalup South System (211Qu), which is described as coastal dunes with calcareous deep sands and yellow sands. The Quindalup South System is represented by coastal scrub.

2.2.4 Hydrography

The Survey Area does not intersect any major watercourses or water bodies that are mapped by State Government GIS databases (Department of Water and Environmental Regulation, 2016). The closest watercourses to the Survey Area are described below:

- Lake Coogee, a basin approximately 1.5 km east of the Survey Area
- Eleven un-named basins located between 1.6 km and 2.3 km east of the Survey Area.

2.2.5 Vegetation Complex

The Survey Area is mapped over the Quindalup Complex which is described 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) - *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 (Department of Biodiversity Conservation and Attractions, 2019). Representation of the vegetation complex is shown in Table 1.

Table 1: Representation of Vegetation Complex on the Swan Coastal Plain (Department of Biodiversity Conservation and Attractions, 2019).

Vegetation complex	Extent			
	Pre-European (ha)	Current (ha)	Remaining (%)	Managed in DBCA Lands (%)*
Representation across the Swan Coastal Plain Bioregion				
Quindalup	54, 573.87	33, 011.64	60.49	9.01

2.2.6 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs) or significant wetlands.

The Survey Area occurs within a mapped ESA (Figure 2). The ESA is associated with Woodman Point Recreation Reserve and related buffers (Department of Water and Environmental Regulation, 2018).

2.2.7 Conservation Areas

The Survey Area occurs within Woodman Point Conservation Park (R49220) and Nature Reserve (R42469), which is vested under the Conservation Commission of WA (Figure 2).

Bush Forever is a State Government Policy and programme that identifies 51,200 ha of regionally significant vegetation for protection, covering 26 vegetation complexes. This amounts to approximately 18% of the original vegetation on the Swan Coastal Plain (SCP) portion of the Perth Metropolitan Area.

Regionally significant vegetation has been identified based on criteria relating to its conservation value. Important criteria in the identification process include the achievement, where possible, of a comprehensive representation of all the ecological communities originally occurring in the region, principally through protecting a target of at least 10% of each vegetation complex in the Bush Forever project boundary (Government of Western Australia, 2000).

The entirety of the Survey Area occurs within Bush Forever Site 341 (Figure 5) (Department of Planning, 2014).

3 Methods

The biological survey documented by this report were undertaken in accordance with relevant EPA and DAWE guidelines (see section 3.1).

3.1 Desktop Assessment

3.1.1 Literature Review

Background information on the Survey Area and surrounds was compiled prior to the field survey (see Section 3). Historical vegetation mapping (Beard, 1976; Shepherd, Beeston and Hopkins, 2002), land systems mapping (Department of Agriculture and Food WA, 2012), and the IBRA classification system (Mitchell, Williams and Desmond, 2002) were consulted to provide broad contextual knowledge of the vegetation units and habitat likely to be encountered within the Survey Area.

The literature review also considered a selection of biological reports detailing assessments undertaken in the region, that were publicly available (Appendix A):

- Cockburn Central East Local Structure Plan (Cce Lsp) Area, Level 1 Flora and Fauna Assessment November 2016 and Addendum – Targeted *Caladenia huegelii* Survey January 2018 (Focused Vision Consulting, 2016)
- Ecological Assessments: Woodman Point Recreational Precinct (AECOM, 2016)
- Flora and Fauna Survey Report: Lots 1, 53 and 55 North Lake Road, Lot 54 Poletti Road and Lots 54, 804 and 9504 Beeliar Drive, Cockburn Central (RPS, 2013)
- Flora and Vegetation Survey: Branch Circus and Hammond Road, Success (RPS, 2008)
- Report for Cockburn Coast; Robb Jetty Ecological Assessment (GHD, 2012a)
- Report for Hilltop/Emplacement Crescent: Ecological Assessment (GHD, 2012b).

3.1.2 Database Searches

Database searches were undertaken to compile a list of potential flora and fauna and identify potential conservation significant flora, fauna, and ecological communities within or surrounding the Survey Areas (Table 2; Appendix B). In addition, an EPBC Protected Matters Search (PMST) was undertaken to identify the potential for Matters of National Environmental Significance (MNES) to occur within or surrounding the Survey Area (Department of Agriculture Water and the Environment, 2021).

The search area for each parameter was varied to reflect distances recommended by DBCA. The search areas are herein referred to collectively as the Study Area.

Table 2: Database Searches of the Survey Area

Database Name	Date Received	Search Target	Search Area
Threatened and Priority Ecological Communities database search (Department of Biodiversity Conservation and Attractions, 2021a)	23 March 2021	TECs and PECs	10 km buffer around the Survey Area
Threatened and Priority Flora (TPFL) database search (Department of Biodiversity Conservation and Attractions, 2020c)	11 March 2021	Threatened and Priority Flora	15 km buffer around the Survey Area
Western Australian Herbarium flora database search (Department of Biodiversity Conservation and Attractions, 2021b)	11 March 2020		5 km buffer around the Survey Area
NatureMap (Department of Biodiversity Conservation and Attractions, 2020a)	2 March 2021	Threatened and Priority flora and fauna, and inventory of potential flora	5 km buffer around the Survey Area
Protected Matters Search Tool (Department of Agriculture Water and the Environment, 2021)	2 March 2021	Commonwealth listed Threatened flora and fauna and TECs	5 km buffer around the Survey Area

3.1.3 Likelihood of Occurrence

Conservation significant flora and fauna species identified from the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area, both prior to and post field survey (Appendix C). The assessment was completed based on the likelihood of occurrence criteria presented in (Table 3).

Only species either recorded within the Survey Area or considered as having a high or medium likelihood of occurrence will be discussed in detail. Species classified as having a low likelihood of occurrence based on the above criteria will not be discussed unless a justification for this classification is required.

Table 3: Likelihood of Occurrence Criteria

Rank	Criteria
Previously Recorded	The species has been previously recorded in the Survey Area
High (Likely to occur)	• There are existing records of the species in close proximity to the Survey Area (within 5 km) • The species is strongly linked to a specific habitat, which is present in the Survey Area; or • The species has more general habitat preferences, and suitable habitat is present.
Medium (May occur)	• There are existing records of the species from the locality (within 10 km), however: ○ The species is strongly linked to a specific habitat, of which only a small amount is present in the Survey Area; or ○ The species has more general habitat preferences, but only some suitable habitat is present. • There is suitable habitat in the Survey Area, but the species is recorded infrequently in the locality.
Low (Unlikely to occur)	• The species is linked to a specific habitat, which is absent from the Survey Area; or • Suitable habitat is present, however there are no existing records of the species from the locality despite reasonable previous search effort in suitable habitat; or • There is some suitable habitat in the Survey Area, however the species is very infrequently recorded in the locality.

3.2 Field Surveys

3.2.1 Field Survey

A reconnaissance flora and vegetation survey was undertaken by Principal Botanist Narelle Whittington (Flora Licences FB62000177 and TFL70 - 1920) initially on the 4 of March, and then an additional area surveyed on the 16 September 2021. Survey effort is demonstrated in Figure 3.

The Survey Area was assessed via meandering traverses and the assessment of four relevés to gather information to characterise and delineate vegetation and compile an inventory of vascular flora. Relevés are unbounded vegetation survey plots. Relevés were used due to the initial survey being undertaken outside of spring (optimal survey time) and the scope of work being a reconnaissance. The following information was recorded at each relevé, using the Fulcrum mobile application:

- Location at data collection points (GPS co-ordinate and datum)
- Landform and soil description
- Relevant descriptors including, slope, aspect, litter cover and bare ground cover
- Inventory of dominant vascular flora including the approximate average height and percentage foliar cover for each taxon recorded

- Vegetation description in accordance with National Vegetation Information System (NVIS) whereby the dominant growth form, height, cover, and species for the three traditional strata (upper, mid, and ground) are described
- Vegetation condition in accordance with the Southwest and Interzone Botanical Provinces vegetation condition scale, and evidence of disturbance (for example clearing, rubbish, feral animals, weed incursion and evidence of feral animals and dieback) where present
- Photographs of the vegetation.

3.2.2 Opportunistic Flora

Additional flora taxa observed opportunistically while traversing on foot within the Survey Area were also recorded. Where populations of perennial conservation significant flora taxa, Declared Pests (DPs) or WoNS were encountered, a GPS location and a count of the individuals present was recorded.

3.2.3 Taxonomy and Nomenclature

Where field identification of plant taxa was not possible, specimens were collected for identification using resources of the WAH. Identification of flora collections was completed by Narelle Whittington.

The finalised species list was checked against FloraBase (Western Australian Herbarium, 2021) to determine the conservation status and known distribution of each taxon. Introduced species were compared against the current BAM Act Declared Plants list the WoNS list to determine their control status (Thorp and Lynch, 2000; Department of Environment and Energy, 2018; Department of Primary Industries and Regional Development, 2018).

3.2.4 Vegetation Unit and Condition Mapping

Broad vegetation and condition mapping was conducted in the field, with boundaries delineated over aerial photography, at a scale of 1:2,000. Broad vegetation units were refined based on taxonomic identification of flora collections, site data collected from the relevés, and mapping notes taken during the field survey. Finalised polygons were digitised and produced as electronic mapping data using GIS software.

Due to a change in the Survey Area boundary, which included the extension of the northern edge by approximately 30m, a small area of dune vegetation mapping was extrapolated equating to .36 ha using aerial photography. Due to the geomorphic patterning of vegetation along the dune system, the boundaries of vegetation types were clearly distinguishable

3.2.5 Statistical Analyses

Due to the scope and the timing of the survey, quadrats were not used in collecting data, therefore, statistical analyses were not undertaken. Floristic Community Types (FCTs) were inferred where applicable.

4 Results

4.1 Limitations

Limitations and constraints of the flora, vegetation and fauna survey are detailed below in Table 4. Despite the limitations identified the assessment is appropriate to support approvals applications for the proposed actions within the Survey Area.

Table 4: Limitations and Constraints Associated with the Survey

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Survey Scope	No	The reconnaissance flora and vegetation survey was undertaken in accordance with EPA (2016c).
Availability of Data	No	All data required to complete the scope of works including regional and local contextual information was available.
Site Access	No	The Survey Area was able to be accessed by on foot.
Survey Intensity and Resources	No	six flora relevés were sampled across the Survey Area as well as additional mapping notes to aid vegetation mapping and delineation. Given the small size of the Survey Area, the entirety of the area could be traversed, and sufficient time was allocated to the flora and vegetation survey. Due to the scope (reconnaissance survey) additional flora species would likely be recorded with additional survey effort.
Experience	No	The flora and vegetation survey was undertaken by principal botanist Narelle Whittington. Narelle has 20 years' experience conducting surveys of similar scope throughout Western Australia and is a specialist in the southwest region. Identification of flora collections was completed by Narelle Whittington at the WAH.
Timing, weather, season	Partial	The recommended primary survey period for the region as per the EPA Technical Guidance is Spring (September – November), Part of the Survey Area was surveyed outside this period. In the three months prior to the initial survey (December 2020 to February 2021), 49.6 mm of rainfall was recorded, which is 4.6 mm above the long-term average of 45.0 mm for the same period.
Life Forms Sampled	Partial	The Survey Area was traversed on foot and representative sites of all remnant vegetation was sampled. Dominant flora species encountered within the Survey Area were recorded. A total of 40 vascular flora taxa were recorded from the Survey Area, comprising 54.18% native flora taxa and 45.82% introduced flora taxa.

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Mapping Reliability	No	Vegetation types were described and mapped based on relevé data and additional mapping notes taken during the field survey. High resolution aerial mapping current at the time of the survey was used to differentiate all vegetation. 0.36 ha of vegetation mapping was extrapolated, however, due to the geomorphic patterning of vegetation along the dune system, the boundaries of vegetation types were clearly distinguishable.
Disturbances (fire, flood etc.)	No	No disturbances occurred during the survey. Areas of disturbance associated with historical clearing, erosion, access tracks, weeds and litter were recorded but were not a constraint on the results of the survey.
Completeness	No	The survey was considered complete for a reconnaissance flora and vegetation survey, and all vegetation types were surveyed and delineated within the Survey Area.

4.2 Flora and Vegetation

4.2.1 Literature Review

The key findings of the flora and vegetation reports reviewed are summarised in Appendix A.

4.2.2 Database Searches

Database searches identified 38 conservation significant flora species occurring within 15 km of the Survey Area, (Figure 5, Appendix B), comprising:

- Eight Threatened species
- Four Priority one species
- Two Priority two species
- 12 Priority three species
- 12 Priority four species.

The desktop assessment identified four PECs and one TEC listed by the State occurring within 10 km of the Survey Area, two of these are listed as TECs under the EPBC Act (Department of Biodiversity Conservation and Attractions, 2020b); (Department of Agriculture Water and the Environment, 2021) (Figure 5):

- SCP30a - *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands (Vulnerable (DBCA), Not listed (EPBC)) – overlapping Survey Area
- SCP24 Northern Spearwood shrublands and woodlands (Priority 3 (DBCA), Not listed (EPBC)) – 2.8 km south east of the Survey Area
- Wooded waterbird wetlands - Wooded wetlands which support colonial waterbird nesting areas (Priority 3 (DBCA), Not listed (EPBC)) - >5 km north east of the Survey Area

- *Banksia* WL SCP - *Banksia* Dominated Woodlands of the Swan Coastal Plain IBRA Region (Priority 3 (DBCA), Endangered (EPBC)) – 3.7 km northeast of the Survey Area
- Tuart woodlands - Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain (Priority 3 (DBCA), Critically Endangered (EPBC)) - overlapping Survey Area.

4.2.3 Pre-Survey Likelihood of Occurrence

The conservation significant species identified in the desktop assessment were reviewed for their likelihood of occurrence within the Survey Area based on the criteria outlined in Table 3. This was done prior to the field work being undertaken and again following the completion of the field work. Prior to the field survey, of the 38 species identified in the desktop assessment, no species had previously been recorded within the Survey Area, three species were considered to have a high likelihood of occurrence, four species were considered to have a medium likelihood and 31 were considered to have a low likelihood of occurrence.

The post field survey likelihood assessment considered the habitat types observed, vegetation condition and survey effort and timing, which, resulted in one species considered to have a high likelihood of occurrence, three species considered to have a medium likelihood and the remaining considered to have a low likelihood of occurrence. One species identified from the database searches was found within the Survey Area. The likelihood assessment is displayed in Appendix C.

4.2.4 Flora Composition

The survey recorded a total of 40 taxa from 33 genera across 21 families (Appendix D). The dominant family was Poaceae (five species), The most dominant genera were *Acacia* (four species) and Euphorbia (three species).

4.2.5 Flora of Conservation Significance

No Threatened flora species pursuant to the EPBC Act and/or gazetted as Threatened pursuant to the BC Act were recorded during the survey.

One DBCA listed Priority species, *Grevillea olivacea* (P4), was recorded within the Survey Area opportunistically in eight locations (Figure 6).

4.2.6 Introduced Flora

A total of 18 introduced species were recorded within the Survey Area, representing 45.82% of the total taxa recorded (Table 5). One species, **Asparagus asparagoides,* is listed as a Declared Pest under the BAM Act (Department of Primary Industries and Regional Development, 2018), and is also listed as a WoNS (Department of Energy and Environment, 2018) (Figure 7). The species was recorded at nine locations, with eight of those restricted to the CpMl vegetation type.

Table 5: Introduced Flora Species within the Survey Area

Species	Common Name	Status under BAM Act	WONS
**Ammophila arenaria*	Marram Grass	Permitted – s11	No
**Asparagus asparagoides*	Bridal Creeper	Declared Pest – s22(2)	Yes
**Avena barbata*	Bearded Oat	Permitted – s11	No
*Bromus diandrus	Great Brome	Permitted – s11	No
**Carpobrotus edulis*	Hottentot Fig	Permitted – s11	No
**Centranthus macrosiphon*	Pretty Betsy	Permitted – s11	No
**Crassula glomerata*	-	Permitted – s11	No
**Ehrharta longiflora*	Annual veld grass	Permitted – s11	No
**Euphorbia paralias*	Sea Spurge	Permitted – s11	No
**Euphorbia peplus*	Petty spurge	Permitted – s11	No
**Euphorbia terracina*	Geraldton Carnation Weed	Permitted – s11	No
**Fumaria muralis*	Wall fumitory	Permitted – s11	No
**Lagurus ovatus*	Hairs tail grass	Permitted – s11	No
**Lysimachia arvensis* var *caerulea*	Pimpernal	Permitted – s11	No
**Oenothera drummondii*	Beach Evening Primrose	Permitted – s11	No
**Pelargonium capitatum*	Rose Pelargonium	Permitted – s11	No
**Tetragonia decumbens*	Sea Spinach	Permitted – s11	No
**Trachyandra divaricata*	Strapweed, False Onion Weed	Permitted – s11	No

4.2.7 Vegetation Types

A total of nine vegetation types were mapped within the Survey Area and cover 2.23 ha. Within the 2.63 ha Survey Area, 0.40 ha was cleared. Vegetation types and descriptions are listed in Table 7 along with their extent within the Survey Area and are mapped in Figure 6. Detailed site sheets for each quadrat are provided in Appendix E.

Table 6: Vegetation Types Occurring within the Survey Area

Vegetation Type Code*	Vegetation Description	Total Area, Proportion of the Survey Area*	Sites	Photograph
CpAr (Rehabilitation area)	*Callitris preissii* tall sparse shrubland over *Acacia rostellifera* low open shrubland over **Avena barbata* and **Bromus diandrus* grassland	0.07 ha 2.25 %	WPR01	
Lg	*Acacia rostellifera* mid sparse shrubland over *Lepidosperma gladiatum* tall sedgeland	0.03 ha 0.85 %	WPR02	

Vegetation Type Code*	Vegetation Description	Total Area, Proportion of the Survey Area*	Sites	Photograph
Sl*Ep	*Spinifex longifolius* and **Ammophila arenaria* mid to tall open tussock grassland over **Euphorbia paralias, *Trachyandra divaricata* and **Oenothera drummondii* low open herbland with occasional *Olearia axillaris, Scaevola crassifolia* and *Acacia rostellifera*	1.19 ha 39.68 %	WPR03	
ArRb	*Acacia rostellifera, Olearia axillaris, Rhagodia baccata* and *Scaevola crassifolia* mid open shrubland over *Spinifex longifolius* and *Acanthocarpus preissii* low open grassland	0.44 ha 14.74 %	WPR04	

Vegetation Type Code*	Vegetation Description	Total Area, Proportion of the Survey Area*	Sites	Photograph
ArGp	*Acacia rostellifera* mid open shrubland over *Acacia cochlearis, Grevillea preissii* and *Rhagodia baccata* low open shrubland over **Bromus diandrus* low open tussock grassland over **Trachyandra divaricata, *Euphorbia terracina* and **Crassula glomerata* low open herbland	0.10 ha 3.40%	WPR05	
MlAr	*Melaleuca lanceolata* and *Agonis flexuosa* tall shrubland over *Acacia rostellifera* and *Grevillea olivacea* mid open shrubland over *Rhagodia baccata* low sparse shrubland over **Ehrharta longiflora* low sparse tussock grassland over **Trachyandra divaricata, *Crassula glomerata* and *Cassytha* sp. low sparse herbland	0.19ha 6.33 %	WPR06	

Vegetation Type Code*	Vegetation Description	Total Area, Proportion of the Survey Area*	Sites	Photograph
CpSg	*Callitris preissii* tall, isolated clumps over *Spyridium globulosum, Acacia lasiocarpa* low isolated clumps of shrubs over **Trachyandra divaricata* low open forbland	0.32 ha 10.75 %	Mapping notes	
Ml	*Mature Melaleuca lanceolata*	0.17 ha 5.63%	Mapping Notes	

Vegetation Type Code*	Vegetation Description	Total Area, Proportion of the Survey Area*	Sites	Photograph
CpMl	*Mature Callitris preissii and Melaleuca lanceolata over weeds*	0.02 ha 0.65 %	Mapping Notes	

*Rounded to the nearest decimal place.

4.2.8 Vegetation of Conservation Significance

Statistical analysis was not undertaken of the vegetation to determine if any TECs or PECs are present. This was due to the scope of the project and the timing of the initial survey which was undertaken outside of the optimal time. Instead, the vegetation types have been inferred to establish whether the vegetation in the Survey Area has the potential to be of conservation significance.

Certain characteristics of Vegetation Type Lg are similar to TEC SCP 19 - Sedgelands in Holocene dune swales of the southern Swan Coastal Plain, which is listed as Critically Endangered by the State and Endangered under the EPBC Act.

Five of the vegetation types identified from the survey, CpSg, CpAr, MlAr, CpMl and Ml are considered to have similarities to FCT 30a2 – *Callitris preissii* (or *Melaleuca lanceolata* forests and woodlands) based on the presence of one or both of the key typical species (*Callitris preissii* and *Melaleuca lanceolata*). FCT 30a2 is listed as a Vulnerable TEC by the State and not listed under the EPBC Act. Due to vegetation type CpAr being an area of rehabilitation, it is not considered to represent the TEC.

4.2.9 Vegetation Condition

Vegetation condition within the Survey Area ranged from Very Good to Completely Degraded. Given the Survey Areas coastal situation, it has been subject to natural weathering conditions, this has produced various vegetation densities depending on the position in the landscape i.e., swale versus dune. Notwithstanding this, historical clearing, or disturbance between 1981 and 1983 has left some areas within the Survey Area devoid of vegetation (Plate 1, Plate 2). An attempt to rehabilitate these areas has been unsuccessful, there are hundreds of residual plant guard stakes present with no associated plant. Other sources of disturbance within the Survey Area are weeds, litter, and trampling. Vegetation condition within the Survey Area is summarised in Table 6 and illustrated in Figure 7.

Plate 1: Survey Area in 1981 (Source: (Landgate, 2020)

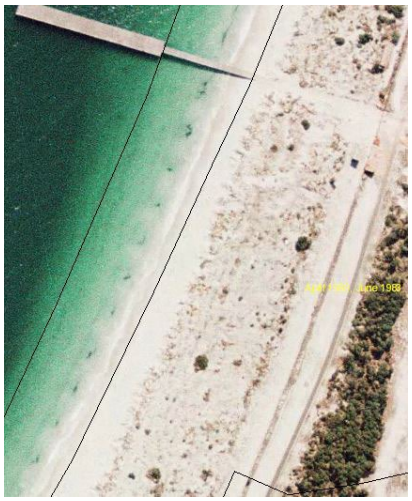


Plate 2: Survey Area in 1983 (Source: (Landgate, 2020)

Table 7: Vegetation Condition within the Survey Area

Vegetation Condition	Extent within the Survey Area (ha)*
Very Good	0.03
Good	0.76
Degraded	1.43
Completely Degraded	0.31
Cleared	0.47

*Rounded to the nearest decimal place.

4.2.10 Regional Representation

The vegetation types described in the Survey Area was correlated with (Heddle, Loneragan and Havel, 1980) broad vegetation types as much as possible, by examining similarities in vegetation descriptions. Differences exist with the terminology used in the descriptions as they are based on different methods of categorising and characterising vegetation types, and the different spatial scale of the analysis (i.e., region vs. local scale). All the surveyed vegetation are considered to represent the Quindalup complex which equates to 2.23 ha.

5 Discussion

5.1 Flora Composition

The suite of flora taxa recorded during the survey is considered below average for the subregion regardless of the timing of the survey (surveys were undertaken both outside and in spring). This can be attributed to the degraded condition of the Survey Area, weed infestations, historical and current land use.

5.2 Survey Adequacy

The flora and vegetation survey effort was in accordance with the scope of works, and appropriate for a reconnaissance flora and vegetation survey within the Quindalup dune system on the Swan Coastal plain. Six flora sites were sampled within the Survey Area as well as mapping notes. The inventory of vascular flora was compiled using site data and opportunistic observations made while traversing the Survey Area. Undertaking an additional survey during the recommended time within the portion of the Survey Area that was surveyed in March would likely result in additional flora species being identified.

5.3 Flora of Conservation Significance

The database searches identified eight Threatened species as having potential to occur in the Survey Area. No Threatened flora species pursuant to the EPBC Act and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act were recorded during the survey and all are considered to have a Low Likelihood of occurring based on the absence of appropriate habitat types.

The database searches identified 30 Priority flora species as potentially occurring in the vicinity of the Survey Area, of these, one species was found during the field survey.

Grevillea olivacea (P4) is an erect, non-lignotuberous shrub that can grow between 1 m and 4.5 m high. The species has red flowers between June and September. It favours white or grey sand on coastal dunes with limestone rocks. The WAH has 35 specimens lodged, with records spanning between Geraldton and Jurien Bay on the Swan Coastal Plain (Western Australian Herbarium, 2020). The species is not endemic to the Woodman point region, however, there is a record at the WAH from Woodman Point. The information regarding the specimen states that the occurrences are a result of self-seeding from plantings. *Grevillea olivacea* (P4) is a popular garden plant that is grown in commercial nurseries and can be commonly found in urban gardens and roadside verges. The specimens found within the Survey Area are most likely planted or garden escapes and therefore not conservation significant.

Plate 3: **Grevillea olivacea* (P4) (Source: 360 Environmental,2021)

5.4 Introduced Flora

Eleven introduced species were recorded within the Survey Area, one of these, **Asparagus asparagoides* is listed as a Declared Pest under the BAM Act and a WoNS.

Eighteen individuals of **Asparagus asparagoides* (Bridal Creeper) were found at nine locations. Bridal creeper is a rhizomatous and tuberous perennial climber which can grow between 1 to 5 m high. The species has white flowers between August and September and can grow in sand, loam, clay, and granite.

Plate 4: **Asparagus asparagoides* (Source: 360 Environmental,2021))

5.5 Vegetation of Conservation Significance

Nine vegetation types were described and mapped within the Survey Area. Vegetation types ArGp, ArRp and Sl*Ep are not considered to be analogous to any State or Commonwealth PECs or TECs.

Certain characteristics of Vegetation Type Lg are considered to be similar to TEC SCP 19 - Sedgelands in Holocene dune swales of the southern Swan Coastal Plain. SCP 19 is a wetland community with occurrences situated in linear damplands and sumplands between Holocene dunes. Typical and common native species are *Acacia rostellifera, Acacia saligna, Xanthorrhoea*

preissii, Baumea juncea, Ficinia nodosa, Lepidosperma gladiatum, and the grass *Poa porphyroclados*. The typical wetland in which this community type occurs is a dampland that becomes water logged in winter, and retains relatively high moisture near the surface of the soil profile in summer (Department of Environment and Conservation, 2011). Following an assessment of the diagnostics of the vegetation type Lg within the Survey Area, regardless of the dominance of *Lepidosperma gladiatum* and its position within a dune swale, it is unlikely that it represents SCP 19 given that there is no wetland present nor likely to be inundated or have high soil moisture during summer.

The potential presence of another TEC that needs further consideration is SCP 30a2 - *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands. SCP 30a2 is a woodland and forest community located on calcareous sandy soils and typically has *Callitris preissii, Melaleuca lanceolata, Spyridium globulosum, Acanthocarpus preissii, Rhagodia baccata, Austrostipa flavescens* and *Trachymene pilosa* present (Gibson *et al.*, 1994). The introduced herbs **Galium murale* (small bedstraw), **Asparagus asparagoides* (bridal creeper) and **Trachyandra divaricata* (dune onion weed) are also common in the vegetation community. The FCT is also mapped as being present within the Survey Area according to Department of Water and Environmental Regulation ((Department of Water and Environmental Regulation, 2016). The difficulty in inferring the presence of 30a2 within the Survey Area is exacerbated by the level of disturbance and poor condition of the vegetation. The vegetation is low in both density and diversity, notwithstanding this, the Survey Area does contain the majority of the typical species of the FCT 30a2. FCT 30a2 is known to be a simple vegetation community in that it contains a very narrow range of flora species in the understorey and is subject to weed invasion ((Pryde, 2008). This information along with the survey results, it can be conjectured that TEC 30a2 does occur within the Survey Area and represented by the vegetations types CpSg, MlAr, CpMl and Ml. These mapped vegetation types either have *Callitris preissii* and/or *Melaleuca lanceolata* present as well as other limited indicator species typical of FCT 30a2. Although vegetation type CpAr contains *Callitris preissii*, it is a rehabilitation site and the vegetation has been planted, therefore is not considered to represent the TEC.

5.6 Regional Representation

The EPA recognises vegetation complexes that are not well represented as being significant. Vegetation complexes which have 10 – 30% (10% in 'constrained areas') remaining may be considered regionally significant. Proposals that would affect a vegetation complex with 10% or less remaining are likely to be formally assessed by the EPA (Environmental Protection Authority, 2006).

The Quindalup complex has 60.49% remaining within the Swan Coastal Plain Bioregion, which is above the retention rate for constrained areas set by both the EPA (Environmental Protection Authority, 2006) and the Commonwealth of Australia (Department of the Environment and Heritage, 2001) for protecting Australia's biological diversity.

6 Conclusion

In summary, the following conclusions on the existing flora and vegetation are made:

- No Threatened flora species pursuant to the EPBC Act and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act were recorded during the survey.
- One DBCA listed Priority flora, *Grevillea olivacea* (P4), was recorded. The specimens found within the Survey Area are most likely planted and therefore not conservation significant. The presence of priority species is unlikely to form a statutory constraint for the Survey Area and is dealt with by DWER and DBCA on a case-by-case basis.
- A total of 18 introduced species were recorded within the Survey Area, representing 45.82% of the total taxa recorded. One species, **Asparagus asparagoides,* is listed as a Declared Pest under the BAM Act and is also listed as a WoNS.
- A total of nine vegetation types were mapped within the Survey Area and cover 2.23 ha. Within the 1.63 ha Survey Area, 0.40 ha was cleared. The natural weathering conditions have produced various vegetation densities depending on the position in the landscape i.e., swale versus dune. Historical clearing or disturbance between 1981 and 1983 has left some areas within the Survey Area devoid of vegetation. Other sources of disturbances within the Survey Area are weeds, litter, and trampling.
- It can be conjectured that TEC 30a2 - does occur within the Survey Area and represented by the vegetations types CpSg, MlAr, CpMl and Ml. These mapped vegetation types either have *Callitris preissii* and/or *Melaleuca lanceolata* present as well as other limited indicator species typical of FCT 30a2 - *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands.
- The Survey Area occurs within a mapped ESA, which is associated with Woodman Point Recreation Reserve and related buffers.
- The entirety of the Survey Area occurs within Bush Forever Site 341.

7 References

AECOM (2016) 'Ecological Assessments: Woodman Point Recreational Precinct'.

Beard, J. S. (1976) *Vegetation survey of Western Australia. Western Australia 1: 1 000 000 vegetation series. Design and cartography by Dept. of Geography, University of W.A*.

Bureau of Meteorology (2007) *About Climate Statistics*.

Bureau of Meteorology (2021) *Monthly climate data statistics*.

Department of Agriculture and Food WA (2012) *Soil-landscape systems of Western Australia (GIS dataset)*. Perth, Australia.

Department of Agriculture Water and the Environment (2021) *Protected Matters Search Tool*. Canberra, Australia.

Department of Biodiversity Conservation and Attractions (2019) *2018 South West Vegetation Complex Statistics Report*.

Department of Biodiversity Conservation and Attractions (2020a) *NatureMap*. Perth, Western Australia.

Department of Biodiversity Conservation and Attractions (2020b) *Threatened and Priority Ecological Communities database request (custom search)*. Perth, Western Australia.

Department of Biodiversity Conservation and Attractions (2020c) *Threatened and Priority Flora database (TPFL) request (custom search)*. Perth, Western Australia.

Department of Biodiversity Conservation and Attractions (2021a) *Threatened and Priority Ecological Communities database request (custom search).* Perth, Australia.

Department of Biodiversity Conservation and Attractions (2021b) *Western Australia Herbarium Flora Database (custom search)*. Perth, Australia.

Department of Environment and Conservation (2011) *Interim Recovery Plan 2011-2016 for Sedgelands in Holocene dune swales. Interim Recovery Plan No. 314No Title*. Perth, Western Australia.

Department of Environment and Energy (2018) *Weeds of National Significance*.

Department of Planning (2014) *Bush Forever Sites (GIS dataset)*. Perth, Australia.

Department of Primary Industries and Regional Development (2018) *Declared Plants List*.

Department of the Environment (2013) *Matters of National Environmental Significance: Significant impact guidelines 1.1*. Canberra, Australia.

Department of the Environment and Heritage (2001) *National Objectives and Targets for Biodiversity Conservation*.

Department of Water and Environmental Regulation (2016) *Hydrography Linear (Heirarchy) (GIS dataset)*. Perth, Australia: Landgate.

Environmental Protection Authority (2006) *Guidance Statement No. 10 Level of Assessment for Proposals affecting Natural Areas within the System 6 Region and Swan Coastal Plain Portion of the System 1 region in Western Australia.* Perth, Western Australia.

Environmental Protection Authority (2016) 'Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment', (December).

Focused Vision Consulting (2016) 'Cockburn Central East Local Structure Plan (Cce Lsp) Area, Level 1 Flora and Fauna Assessment November 2016 And Addendum - Targeted Caladenia huegelii Survey January 2018', (November 2016).

GHD (2012a) 'Report for Cockburn Coast; Robb Jetty Ecological Assessment'.

GHD (2012b) 'Report for Hilltop/ Emplacement Crescent: Ecological assessment'.

Gibson, N. *et al.* (1994) 'A floristic survey of the southern Swan Coastal Plain', *Department of Conservation and Land Management and the Conservation Council of Western Australia, Perth*.

Government of Western Australia (2000) *Bush Forever Volume 2*.

Heddle, E., Loneragan, O. and Havel, J. (1980) *Vegetation of the Darling System*. Perth, Australia.

Landgate (2020) *WA Now Mosaic*. Perth, Australia.

Mitchell, D., Williams, K. and Desmond, A. (2002) *Swan Coastal Plain 2 (SWA2 – Swan Coastal Plain subregion)*. Perth, Australia.

Pryde, J. (2008) 'Rottnest Island Pine Community', *Landscope*, 23(2), p. 47.

RPS (2008) 'FLORA AND VEGETATION SURVEY Branch Circus and Hammond Road , Success', (June 2008).

RPS (2013) 'Flora and fauna survey report: Lots 1, 53 and 55 North Lake Road, Lot 54 Poletti Road and Lots 54, 804 and 9504 Beeliar Drive, Cockburn Central'.

Shepherd, D. P., Beeston, G. R. and Hopkins, A. J. M. (2002) *Native Vegetation in Western Australia Technical Report 249*. Perth, Australia.

Thorp, J. R. and Lynch, R. (2000) *The determination of weeds of national significance*. Launceston, Australia: National Weeds Strategy Executive Committee.

Western Australian Herbarium (2020) *FloraBase - The Western Australian Flora*. Perth, Western Australia.

Western Australian Herbarium (2021) *FloraBase - The Western Australian Flora*. Perth, Australia.

8 Report Disclaimer

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

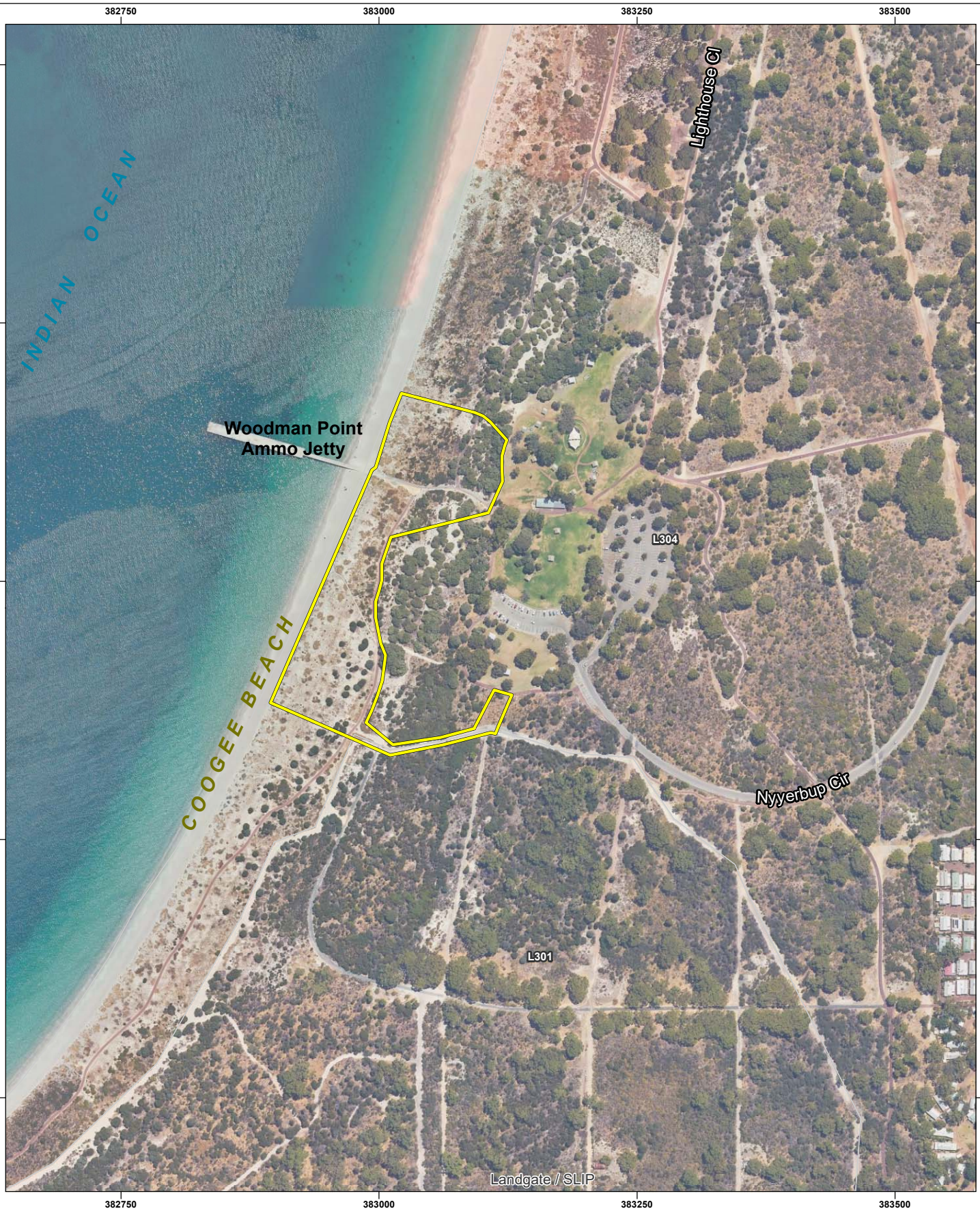
In the preparation of this report, 360 Environmental has relied upon documents, information, data, and analyses ("client's information") provided by the client and other individuals and entities. In most cases where client's information has been relied upon, such reliance has been indicated in this report.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

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

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

Subject to the terms of the contract between the Client and 360 Environmental Pty Ltd, copying, reproducing, disclosing, or disseminating parts of this report is prohibited (except to the extent required by law) unless the report is produced in its entirety including this page, without the prior written consent of 360 Environmental Pty Ltd.

Figures



Legend

- Lot Boundaries
- Survey Area

Powered By SLIP ENABLER

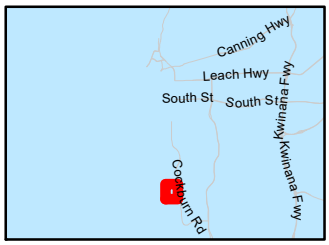
- LOCALITY MAP SOURCED FROM LANDGATE 2020
- OTHER DATA SOURCED LANDGATE 2020
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

0 50 100 150 N

Meters
1:5,000 @ A4

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

LOCALITY MAP



360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4413	20-Jul-2022

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
PW	NW	NW	0

Department of Transport
Woodman Point Ammo Jetty

Woodman Point Flora and Vegetation Reconnaissance Survey

Figure 1
Site Location - Survey Area

K:\Projects\1.0 EBS\4413 Woodman Point Reconnaissance Flora and Vegetation Survey\July2022\4413 F01 Site Location - Survey Area.mxd

Legend

- Survey Area
- Regional Ecological Linkage
- Bush Forever Sites
- DBCA Managed Land

Powered By SLIP ENABLER

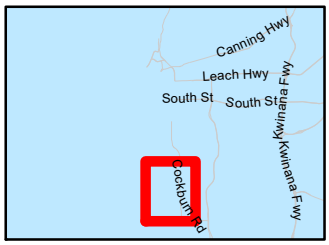
- LOCALITY MAP SOURCED FROM LANDGATE 2020
- OTHER DATA SOURCED LANDGATE 2020
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

0 210 420 630 Meters
1:20,000 @ A4

N

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

LOCALITY MAP



360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4413	20-Jul-2022

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
PW	NW	NW	0

Department of Transport
Woodman Point Ammo Jetty

Woodman Point Flora and Vegetation Reconnaissance Survey

Figure 2

Conservation and Environmentally Sensitive Areas

K:\Projects\1.0 EBS\4413 Woodman Point Reconnaissance Flora and Vegetation Survey\July2022\4413 F03 Conservation and Environmentally Sensitive Areas.mxd

Legend

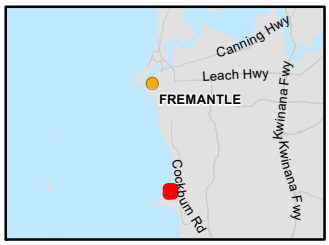
- Survey Area
- Releves
- GPS Tracks

0 20 40 60 Meters
1:2,000 @ A4

N

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

LOCALITY MAP



Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2020
- OTHER DATA SOURCED LANDGATE 2020
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4413	20-Jul-2022

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
PW	NW	NW	0

Department of Transport
Woodman Point Ammo Jetty

Woodman Point Flora and Vegetation Reconnaissance Survey

Figure 3
Survey Effort

K:\Projects\1.0 EBS\4413 Woodman Point Reconnaissance Flora and Vegetation Survey\July2022\4413 F04 Survey Effort.mxd

DBCA Threatened and Priority Flora Locations

- *Acacia lasiocarpa* var. bracteolata long peduncle variant (G.J. Keighery 5026)(1)
- *Angianthus micropodioides* (3)
- *Austrostipa mundula* (3)
- *Beyeria cinerea subsp. cinerea* (3)
- *Bossiaea modesta* (2)
- *Caladenia huegelii* (T)
- *Calothamnus graniticus* subsp. *leptophyllus* (4)
- *Cyathochaeta teretifolia* (3)
- *Dampiera triloba* (3)
- *Diuris drummondii* (T)
- *Diuris micrantha* (T)
- *Diuris purdiei* (T)
- *Dodonaea hackettiana* (4)
- *Drakaea elastica* (T)
- *Drakaea micrantha* (T)
- *Grevillea olivacea* (4)
- *Grevillea thelemanniana* (T)
- *Hibbertia leptotheca* (3)
- *Hydrocotyle lemnoides* (4)
- *Hydrocotyle striata* (1)
- *Jacksonia gracillima* (3)
- *Jacksonia sericea* (4)
- *Kennedia beckxiana* (4)
- *Lachnagrostis nesomytica* subsp. *paralia* (1)
- *Lepidium puberulum* (4)
- *Levenhookia preissii* (1)
- *Microtis quadrata* (4)
- *Myosotis australis* (4)
- *Phlebocarya pilosissima* subsp. *pilosissima* (3)
- *Pimelea calcicola* (3)
- *Stylidium longitubum* (4)
- *Stylidium maritimum* (3)
- *Stylidium paludicola* (3)
- *Styphelia filifolia* (3)
- *Synaphea* sp. Fairbridge Farm (D. Papenfus 696) (T)
- *Thelymitra variegata* (2)
- *Tripterococcus* sp. *Brachylobus* (A.S. George 14234) (4)
- *Verticordia lindleyi* subsp. *lindleyi* (4)

Legend

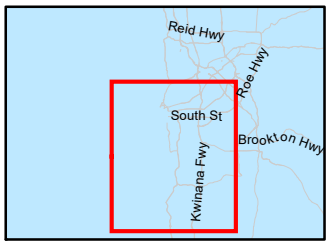
0 1,800 3,600 5,400 Meters

1:175,000 @ A4

N

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

LOCALITY MAP



Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2020
- OTHER DATA SOURCED LANDGATE 2020
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4413	20-Jul-2022

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
PW	NW	NW	0

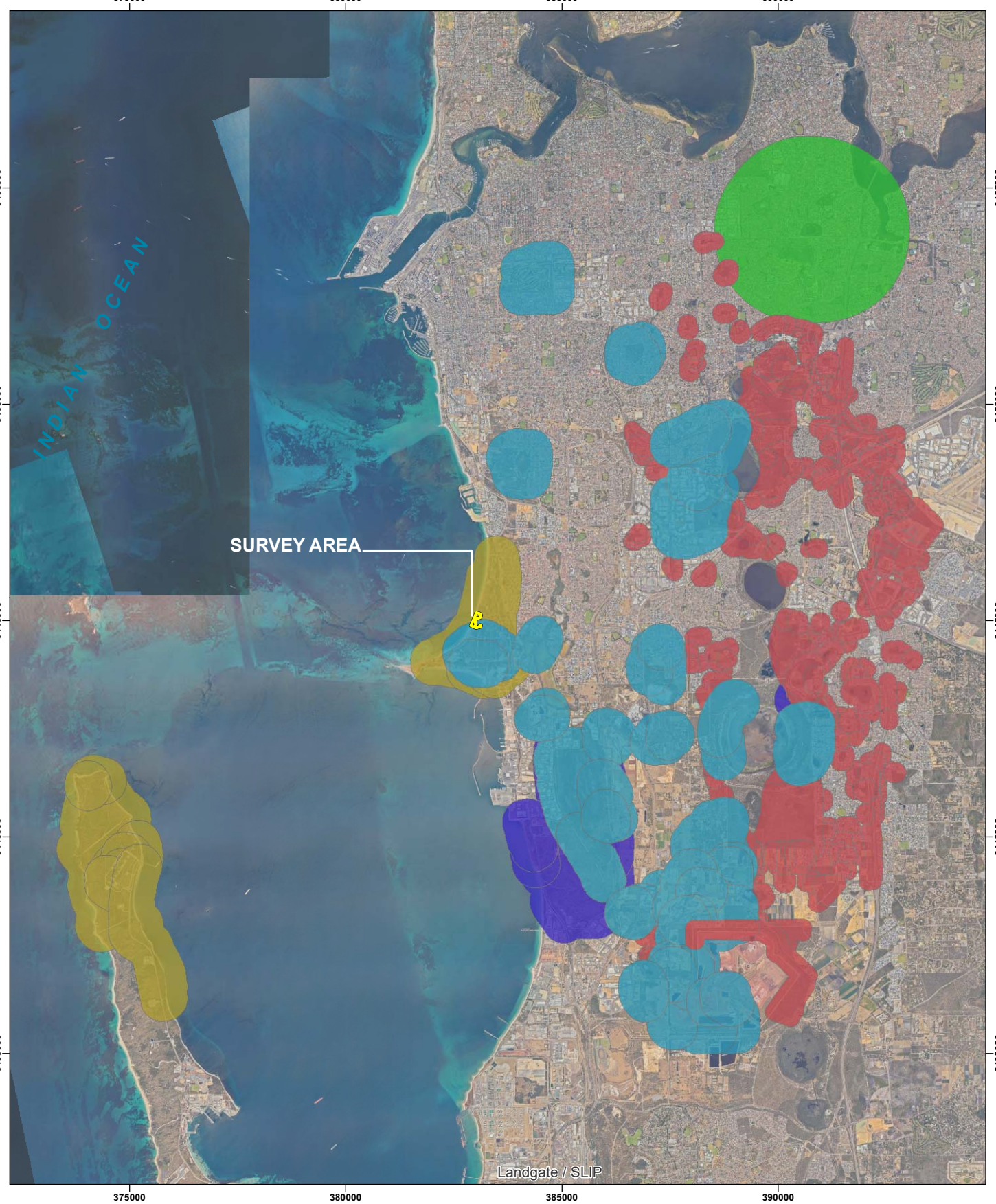
Department of Transport
Woodman Point Ammo Jetty

Woodman Point Flora and Vegetation Reconnaissance Survey

Figure 4

DBCA Threatened and Priority Flora Locations

K:\Projects\1.0 EBS\4413 Woodman Point Reconnaissance Flora and Vegetation Survey\July2022\4413 F05 DBCA Threatened and Priority Flora Locations.mxd



Legend

- Survey Area

DBCA Threatened and Priority Ecological Communities

- Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region
- Callitris preissii (or Melaleuca lanceolata) forests and woodlands, Swan Coastal Plain (floristic community type 30a as originally described in Gibson et al. (1994))
- Northern Spearwood shrublands and woodlands
- Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain
- Wooded wetlands which support colonial waterbird nesting areas

Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2020
- OTHER DATA SOURCED LANDGATE 2020
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

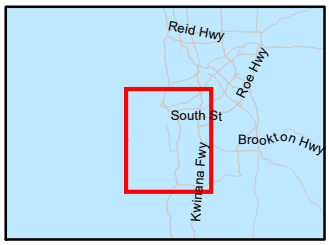
0 1,250 2,500 3,750 Meters

1:120,000 @ A4

N

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

LOCALITY MAP



360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4413	20-Jul-2022

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
PW	NW	NW	0

Department of Transport
Woodman Point Ammo Jetty

Woodman Point Flora and Vegetation Reconnaissance Survey

Figure 5

DBCA Threatened and Priority Ecological Communities

K:\Projects\1.0 EBS\4413 Woodman Point Reconnaissance Flora and Vegetation Survey\July2022\4413 F06 DBCA Threatened and Priority Ecological Communities.mxd

Legend

Releves

Priority Flora Locations

Grevillea olivacea (P4)

Vegetation Types

- ArGp
- ArRb
- CpAr
- CpMl
- CpSg
- Lg
- Ml
- MlAr
- Sl*Ep
- Cleared

Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2020
- OTHER DATA SOURCED LANDGATE 2020
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020

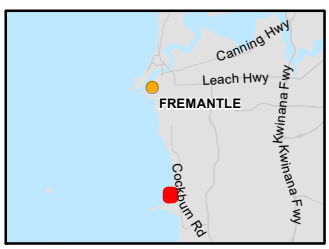
0 20 40 60 Meters

1:2,000 @ A4

N

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

LOCALITY MAP



360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4413	20-Jul-2022

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
PW	NW	NW	0

Department of Transport
Woodman Point Ammo Jetty

Woodman Point Flora and Vegetation Reconnaissance Survey

Figure 6
Vegetation Types

K:\Projects\1.0 EBS\4413 Woodman Point Reconnaissance Flora and Vegetation Survey\July2022\4413 F07 Vegetation Types.mxd

Legend

- Survey Area
- **Asparagus asparagoides*

Vegetation Condition

- Very Good
- Good
- Degraded
- Completely Degraded
- Cleared

Powered By SLIP ENABLER

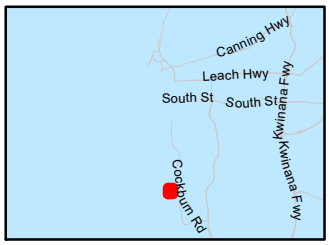
- LOCALITY MAP SOURCED FROM LANDGATE 2020
- OTHER DATA SOURCED LANDGATE 2020
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

0 20 40 60 Meters
1:2,000 @ A4

N

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

LOCALITY MAP



360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4413	20-Jul-2022

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
PW	NW	NW	0

Department of Transport
Woodman Point Ammo Jetty

Woodman Point Flora and Vegetation Reconnaissance Survey

Figure 7
Vegetation Condition

K:\Projects\1.0 EBS\4413 Woodman Point Reconnaissance Flora and Vegetation Survey\July2022\4413 F08 Vegetation Condition.mxd

Appendices

Appendix A
Literature Review

Appendix A: Literature Review

Report	Survey Area	Survey Type	Survey Timing and Seasonal Conditions	No. of Vegetation Types Recorded	TEC / PEC's Present	Total Taxa Recorded	No. of Con Sig species	Declared Pest or WoNS Recorded
Ecological Assessments: Woodman Point Recreational Precinct (AECOM, 2016)	1.4 km east south east Survey area: 32 ha	Basic flora and vegetation assessment 2 quadrats and relevés	Sep 2015 Below average annual rainfall	4 vegetation types	1 TEC, No PECs *Callitris preissii/ Melaleuca lanceolata* forests and woodlands	34	-	19 introduced taxa Declared plant species: **Asparagus asparagoides, *Zantedeschia aethiopica*
Report for Hilltop/ Emplacement Crescent: Ecological assessment (GHD, 2012b)	5.3 km north north east	Basic flora and vegetation assessment 8 10x10 m quadrats	May 2012	5 vegetation types	No TECs or PECs	55	-	27 introduced taxa Declared plant species: **Asparagus asparagoides*
Report for Cockburn Coast; Robb Jetty Ecological Assessment (GHD, 2012a)	5.3 km north north east	Basic flora and vegetation assessment 4 10x10 m quadrats	March 2012	-	No TECs or PECs	-	-	Declared plant species: **Asparagus asparagoides, *Echium plantagineum, *Tamarix philoxeroides*
Flora and Vegetation Survey: Branch Circus and Hammond Road, Success (RPS, 2008)	8.4 km east	Detailed flora and vegetation assessment 10 10x10 m quadrats	Aug, Oct 2007 Below average annual rainfall	6 vegetation types	No TECs or PECs	229	3 Priority flora species *?Byblis gigantea* (P2), *Dodonaea hackettiana* (P4), *Eucalyptus rudis* subsp. *cratyantha* (P4)	74 introduced taxa Declared plant species: **Asparagus asparagoides, *Zantedeschia aethiopica*
Flora and Fauna Survey Report: Lots 1, 53 and 55 North Lake Road, Lot 54 Poletti Road and Lots 54, 804	9.5 km east Survey area: 35.01 ha	Detailed flora and vegetation assessment	Sep, Oct 2011	8 vegetation types	No TECs or PECs	183	1 Priority flora species *Caladenia speciosa* (P4)	36 introduced taxa Declared plant species: **Zantedeschia aethiopica*

and 9504 Beeliar Drive, Cockburn Central (RPS, 2013)		8 10x10 m quadrats, 4 relevés	Above average annual rainfall					
Cockburn Central East Local Structure Plan (Cce Lsp) Area, Level 1 Flora and Fauna Assessment November 2016 And Addendum - Targeted *Caladenia huegelii* Survey January 2018 (Focused Vision Consulting, 2016)	10.3 km east north east Survey area: 31.21 ha	Basic flora and vegetation assessment Targeted orchid survey 5 quadrats	Sep 2016	7 vegetation types	1 TEC, No PECs Banksia woodlands of the Swan Coastal Plain	107	-	45 introduced taxa Declared plant species: **Asparagus asparagoides,* **Echium plantagineum,* **Zantedeschia aethiopica,* **Gomphocarpus fruticosus*

Appendix B
Database Searches

Appendix B: Database Searches

DBCA Threatened and Priority Flora List Database Search Results

PopId	Taxon	ConsStatus	PopNumber	District	Vesting	CountDate	InFlower	HabNotes	Landform	SoilType	SoilColor	AssSpecies	Veg_domA1	Veg_domA2	Veg_Stru_B
94378	*Amanita carneiphylla*	3	1	SWAN COASTAL	PRI	34853	N	Banksia sp.	RI_DUNE	SAND		*Eucalyptus marginata, Xanthorrhoea preissii, Pinus pinaster*	*Eucalyptus marginata*		Unknown Veg Class
94379	*Amanita preissii*	3	1	SWAN COASTAL	PRI	34853	N	Banksia sp.	RI_DUNE	SAND		*Eucalyptus marginata, Xanthorrhoea preissii, Pinus pinaster*	*Eucalyptus marginata*		Unknown Veg Class
89361	*Angianthus micropodioides*	3	2	SWAN COASTAL	UNKNOWN	30706	N	Soil Condition:Saline;	OD_RVRBK	SAND					
89362	*Angianthus micropodioides*	3	3	SWAN COASTAL	UNKNOWN	32480	N	Soil Condition:Saline; Succulent shrubland.	OD_RVRBK	CLAY_SND		*Halosarcia* sp.	*Halosarcia* sp.		
84939	*Caladenia huegelii*	T	3	SWAN COASTAL	PRI	37987	N	Habitat probably destroyed for housing development in 1987/88.	FL_PLAIN	SAND		*Eucalyptus marginata, Allocasuarina fraseriana, Banksia attenuata, Banksia ilicifolia*	*Eucalyptus marginata*		woodland 10-30m, 20-50%
84943	*Caladenia huegelii*	T	4	SWAN COASTAL	LGA	38252	N	Healthy bushland to the south. Banksia Woodland	FLAT	SAND	GREY	*Eucalyptus marginata, Caladenia aurenicola, Allocasuarina fraseriana, Banksia attenuata, Banksia ilicifolia*	*Eucalyptus marginata, Caladenia aurenicola*		woodland 10-30m, 20-50%
84953	*Caladenia huegelii*	T	6	SWAN COASTAL	PRI	41176	Y	There were also some Excellent patches within the area. Low Open Forest of Banksia attenuata, B. menziesii, Allocasuarina fraseriana over Shrubland of Xanthorrhoea preissii, Macrozamia riedlei, Stirlingia latifolia, Hibbertia hypericoides, H. subvagina	SL_LO_GE	SAND	GREY	*Scholtzia involucrata, Caladenia flava, C. paludosa, C. arenicola, Chaemascilla corymbosa, Hibbertia huegelii, Burchardia congesta, Phlebocarya ciliata, Caladenia discoidea, Pterostylis recurva, Diuris corymbosa, Neurachne alopecuroidea.*			
108283	*Caladenia huegelii*	T	6	SWAN COASTAL	PRI	41176	Y	There were also some Excellent patches within the area. Low Open Forest of Banksia attenuata, B. menziesii, Allocasuarina fraseriana over Shrubland of Xanthorrhoea preissii, Macrozamia riedlei, Stirlingia latifolia, Hibbertia hypericoides, H. subvagina	SL_LO_GE	SAND	GREY	*Scholtzia involucrata, Caladenia flava, C. paludosa, C. arenicola, Chaemascilla corymbosa, Hibbertia huegelii, Burchardia congesta, Phlebocarya ciliata, Caladenia discoidea, Pterostylis recurva, Diuris corymbosa, Neurachne alopecuroidea.*			
108284	*Caladenia huegelii*	T	6	SWAN COASTAL	MRD	41176	Y	There were also some Excellent patches within the area. Low Open Forest of Banksia attenuata, B. menziesii, Allocasuarina fraseriana over Shrubland of Xanthorrhoea preissii, Macrozamia riedlei, Stirlingia latifolia, Hibbertia hypericoides, H. subvagina	SL_LO_GE	SAND	GREY	*Scholtzia involucrata, Caladenia flava, C. paludosa, C. arenicola, Chaemascilla corymbosa, Hibbertia huegelii, Burchardia congesta, Phlebocarya ciliata, Caladenia discoidea, Pterostylis recurva, Diuris corymbosa, Neurachne alopecuroidea.*			
108285	*Caladenia huegelii*	T	6	SWAN COASTAL	PRI	41548	N	There were also some Excellent patches within the area. Low Open Forest of Banksia attenuata, B. menziesii, Allocasuarina fraseriana over Shrubland of Xanthorrhoea preissii, Macrozamia riedlei, Stirlingia latifolia, Hibbertia hypericoides, H. subvagina	SL_LO_GE	SAND	GREY	*Scholtzia involucrata, Caladenia flava, C. paludosa, C. arenicola, Chaemascilla corymbosa, Hibbertia huegelii, Burchardia congesta, Phlebocarya ciliata, Caladenia discoidea, Pterostylis recurva, Diuris corymbosa, Neurachne alopecuroidea.*			
84970	*Caladenia huegelii*	T	9	SWAN COASTAL	RDL	38261	N	Healthy to moderate woodland. Conostylis aculeata, Dasypogon bromelifolius, Stirlingia latifolia, Pimelea	RI_DUNE	SAND	GREY	*Eucalyptus marginata, Eucalyptus rudis ., Allocasurina fraseriana, Melaleuca ., Banksia attenuata, Banksia ilicifolia, Banksia menziesii*	*Eucalyptus marginata, Eucalyptus rudis.*		tall open shrubland >2m, 20-50%
84934	*Caladenia huegelii*	T	18	SWAN COASTAL	LGA	41183	Y		WETLAND	SAND	GREY	*Dasypogon bromeliifolius, Burchardia congesa, very open herbland over Lygnia sp. sedgeland*	*Banksia attenuata*	*Banksia ilicifolia*	low woodland <10m, 20-50%
97270	*Caladenia huegelii*	T	21	SWAN COASTAL	LGA	38271	N	Xanthorrhoea preissii, Patersonia sp., Hibbertia sp., Stirlingia latifolia. Low Woodland A.	FLAT	SAND	GREY	*Banksia attenuata, B. menziesii, Caladenia arenicola, Allocasuarina fraseriana, Banksia ilicifolia*	*Banksia attenuata, B. menziesii*		Unknown Veg Class
97271	*Caladenia huegelii*	T	21	SWAN COASTAL	LGA	36070	Y		FL_PLAIN	SAND	WHITE	*Banksia attenuata, Banksia menziesii, Allocasuarina fraseriana, Leptospermum sp.*	*Banksia attenuata*		Unknown Veg Class
97273	*Caladenia huegelii*	T	28	SWAN COASTAL	MTR	38430	N	Banksia woodland.	FLAT	SAND	GREY	*Banksia attenuata, Banksia menziesii, Xanthorrhoea preisii*	*Banksia attenuata*		Unknown Veg Class

PopId	Taxon	ConsStatus	PopNumber	District	Vesting	CountDate	InFlower	HabNotes	Landform	SoilType	SoilColor	AssSpecies	Veg_domA1	Veg_domA2	Veg_Stru_B
97274	*Caladenia huegelii*	T	28	SWAN COASTAL	PRI	38991	Y	Banksia over heath.			GREY	*Caladenia flava, Caladenia arenicola, Pterostylis vittata.*			
84944	*Caladenia huegelii*	T	41	SWAN COASTAL	MRD	39013	N	Banksia/Jarrah woodland. Xanthorrhoea preisii, Patersonia sp., Hibbertia sp., Stirlingia latifolia.	FLAT	SAND	GREY	*Banksia attenuata, Banksia menzesii, Banksia ilicifolia, Allocasuarina fraseriana*	*Banksia attenuata*		Unknown Veg Class
97288	*Caladenia huegelii*	T	42	SWAN COASTAL	SPC	40809	Y	Low open woodland over low open shrubland and herbland on lower slopes. Banksia Woodland. The overall condition of the vegetation due to drought conditions is declining. Recentfire (April 2011?) in NE edge of Lot 820, NW edge of Lot 4 (42F) & SE edge o	SLOPE	SAND	WHITE	*Melaleuca thymoides, Desmocladus* sp., *Melaleuca preissiana, Dasypogon* sp. *<2% cover of sedges & Grasses - Schoenus caespitosa, S. clandestinus, Lyginia imberbis. Orchid species present: Pterostlis recurva, P. sanguineus, Diuris brumalis/corymbosa, caladeni*	*Banksia menziesii*	*Banksia attenuata*	low open woodland <10m, 0. 25-20%
97289	*Caladenia huegelii*	T	42	SWAN COASTAL	PRI	41549	Y	Vegetation away from the edges within the wider remnants were in Excellent condition; the more narrow remnants were Good to Completely Degraded. This site contains a high diversity of flora species.	FL_PLAIN	SAND	GREY	*Nuytsia floribunda, Allocasuarina humilis, Conostephium preissii, Gompholobium tomentosum, Bossiaea eriocarpa, Stirlingia latifolia, Amphipogon turbinatus, Conostylis aculeata* ssp. *cygnorum, Eremaea pauciflora, Burchardia congesta, Acacia lasiocarpa, Hem*	*Banksia attenuata*	*Banksia menziesii*	sparse shrubland 1-2m, 0. 25-20%
97290	*Caladenia huegelii*	T	42	SWAN COASTAL	PRI	38269	Y	Low open woodland over low open shrubland and herbland on lower slopes. Banksia Woodland.	SLOPE	SAND	GREY	*Melaleuca thymoides, Desmocladus* sp., *Melaleuca preissiana, Dasypogon* sp.	*Melaleuca thymoides*		Unknown Veg Class
97291	*Caladenia huegelii*	T	42	SWAN COASTAL	LGA	40809	N	Low open woodland over low open shrubland and herbland on lower slopes. Banksia Woodland. Lowerslope to drainage line. Undulating topography. Habitat condition: Good to degraded. The road reserve is declining in condition due to the impacts of rubbish	SLOPE	SAND	GREY	*Melaleuca thymoides, Desmocladus* sp., *Melaleuca preissiana, Dasypogon* sp.	*Eucalyptus todtiana*	*Banksia menziesii*	low open woodland <10m, 0. 25-20%
106241	*Caladenia huegelii*	T	42	SWAN COASTAL	PRI	38639	Y	Low open woodland over low open shrubland and herbland on lower slopes. Banksia Woodland.	SLOPE	SAND	GREY	*Melaleuca thymoides, Desmocladus* sp., *Melaleuca preissiana, Dasypogon* sp.			
106242	*Caladenia huegelii*	T	42	SWAN COASTAL	PRI	38639	Y	Low open woodland over low open shrubland and herbland on lower slopes. Banksia Woodland.	SLOPE	SAND	GREY	*Melaleuca thymoides, Desmocladus* sp., *Melaleuca preissiana, Dasypogon* sp.			
84950	*Caladenia huegelii*	T	55	SWAN COASTAL	MRD	39708	Y	Banksia Low Woodland	FL_PLAIN	SAND	GREY	*Banksia menziesii, Xanthorrhoea preissii, Acacia pulchella, Patersonia occidentalis*	*Banksia menziesii*		Unknown Veg Class
97297	*Caladenia huegelii*	T	56	SWAN COASTAL	COM	38254	N	Open Banksia over heath.	FLAT	SAND	GREY				
97298	*Caladenia huegelii*	T	56	SWAN COASTAL	COM	38254	Y	Banksia woodland.	FLAT	SAND	WHITE				
97299	*Caladenia huegelii*	T	56	SWAN COASTAL	COM	40821	Y	Habitat is currently in very good condition, but under threat from clearing and increased edge effects.	FLAT	SAND	GREY		*Banksia attenuata*	*Banksia menziesii*	sparse shrubland 1-2m, 0. 25-20%
97300	*Caladenia huegelii*	T	56	SWAN COASTAL	COM	38624	Y	Banksia woodland.	FLAT	SAND	WHITE				
97301	*Caladenia huegelii*	T	56	SWAN COASTAL	COM	38624	Y	Banksia woodland.	FLAT	SAND	WHITE				
97302	*Caladenia huegelii*	T	56	SWAN COASTAL	COM	38624	Y	Banksia woodland.	FLAT	SAND	WHITE				
97304	*Caladenia huegelii*	T	56	SWAN COASTAL	COM	38623	Y	Banksia woodland.	FLAT	SAND	WHITE				
84951	*Caladenia huegelii*	T	57	SWAN COASTAL	LGA	39716	N	Banksia Low woodland. Dom sp: Hibbertia subvaginata, Caladenia flava, C. latifolia, Hypochaeris glabra.	FLAT	SAND	GREY	*Banksia attenuata, Banksia menziesii, Ehrharta longiflora, Xanthorrhoea preissii*	*Banksia attenuata*		Unknown Veg Class
84952	*Caladenia huegelii*	T	58	SWAN COASTAL	LGA	38267	Y	Banksia woodland.	FLAT	SAND	GREY	*Banksia* sp., *Allocasuarina, Hibbertia* sp., *Xanthorrhoea* sp.	*Banksia* sp.		Unknown Veg Class
97306	*Caladenia huegelii*	T	59	SWAN COASTAL	CC	38251	N	Banksia woodland.	FLAT	SAND	GREY				
97307	*Caladenia huegelii*	T	59	SWAN COASTAL	CC	38251	Y	Banksia woodland.	FLAT	SAND	GREY				
97308	*Caladenia huegelii*	T	59	SWAN COASTAL	CC	40455	N	Banksia woodland. *Erharta calycina at densities >70%.	SLOPE	SAND	WHITE	*Banksia attenuata, Allocasuarina fraseriana, Banksia menziesii*	*Banksia attenuata*		Unknown Veg Class
97309	*Caladenia huegelii*	T	59	SWAN COASTAL	CC	40820	Y	Presence of perennial veldt grass (highly invasive weed species) is the factor downgrading condition from excellent to very good. Intact native species structure and diversity	SLOPE	SAND	GREY		*Banksia attenuata*	*Banksia menziesii*	
97310	*Caladenia huegelii*	T	59	SWAN COASTAL	CC	41177	Y		SLOPE	SAND	GREY		*Banksia attenuata*	*Banksia menziesii*	
114909	*Caladenia huegelii*	T	59	SWAN COASTAL	RDL	41177	Y	Located in small patch of excellent bush adjacent to a more disturbed area	HILL	SAND	GREY	*Conostylis aculeara, Lygnia barbarta, Sowerbaea laxiflora*	*Eucalyptus marginata*	*Eucalyptus todtiana*	woodland 10-30m, 20-50%

PopId	Taxon	ConsStatus	PopNumber	District	Vesting	CountDate	InFlower	HabNotes	Landform	SoilType	SoilColor	AssSpecies	Veg_domA1	Veg_domA2	Veg_Stru_B
97312	*Caladenia huegelii*	T	60	SWAN COASTAL	PRI	38636	Y	Banksia Woodland	FLAT	SAND	GREY				
97313	*Caladenia huegelii*	T	60	SWAN COASTAL	PRI	38636	Y								
97314	*Caladenia huegelii*	T	60	SWAN COASTAL	PRI	38641	Y								
106221	*Caladenia huegelii*	T	60	SWAN COASTAL	PRI	38635	Y								
84954	*Caladenia huegelii*	T	61	SWAN COASTAL	PRI	38630	Y	Banksia wookland, understorey of a variety of grasses of Hibbertia.	FLAT	SAND	GREY				
84955	*Caladenia huegelii*	T	62	SWAN COASTAL	LGA	41544	Y	Low Open Forest of Banksia attenuata, B. menziesii, B. ilicifolia, Allocasuarina fraseriana and Nuytsia floribunda overTall Shrubland of Adenanthos cygnorum and Kunzea glabrescens over Open Low Heath of Xanthorrhoea preissii, Melaleuca thymoides, Calytri	FLAT	SAND	GREY	*Lyginia barbata, Amphipogon turbinatus, Patersonia occidentalis, Burchardia congesta, Drosera erythrorhiza, Conostylis juncea, Anigozanthos manglesii, Jacksonia sternbergiana.*			
84960	*Caladenia huegelii*	T	67	SWAN COASTAL	NON	40826	Y		FLAT	SAND	GREY	*Allocasuarina fraseriana, Nuytsia floribunda, Amphipogon turbinatus, Anigozanthos manglesii, Burchardia congesta, PAtersonia occidentalis, Conosylis aculeata, Lechenaultia biloba, Pterostylis sanguineus*	*Banksia attenuata*	*Banksia menziesii*	tall open shrubland >2m, 20-50%
84964	*Caladenia huegelii*	T	72	SWAN COASTAL	PRI	39344	Y		FLAT	SAND		*Allocasuarina fraseriana, Banksia attenuata, Stirlingia latifolia, Hibbertia hypericoides*	*Allocasuarina fraseriana*		Unknown Veg Class
84968	*Caladenia huegelii*	T	76	SWAN COASTAL	PRI	40087	Y	Banksia woodland. Kunzea ericifolia, Lepidosperma spp, Xanthorrhoea preisii,		SAND	GREY	*Eucalyptus todtiana, Banksia ilicifolia, Allocasuarina fraseriana*	*Eucalyptus todtiana*		Unknown Veg Class
106981	*Caladenia huegelii*	T	78	SWAN COASTAL	PRI	41177	Y	Tall Open Scrub of Kunzea glabrescens and Adenanthos cygnorum	SLOPE	SAND	GREY		*Banksia attenuata*	*Banksia menziesii*	
107683	*Caladenia huegelii*	T	78	SWAN COASTAL	PRI	41542	Y								
109378	*Caladenia huegelii*	T	79	SWAN COASTAL	PRI	41891			FLAT	SAND	GREY	*Banksia* sp., *King Spider Orchid, Carousel Spider Orchid, Tuart Spider Orchid*			
114889	*Caladenia huegelii*	T	84	SWAN COASTAL	PRI	41178	Y		FLAT	SAND	GREY	*Xanthorrhoea preissii, Regillia inops, Grevillea tomentosum.* *Lomandria* sp., *Daypogon brom* *Haemondorium spicatum, Patersonia occidentalis*	*Banksia attenuata*	*Allocasuarina fraseriana*	woodland 10-30m, 20-50%
93196	*Cyathochaeta teretifolia*	3	12	SWAN COASTAL	PRI	39379	N	Woodland.	OD_SWAMP	PEAT	BLACK	*Melaleuca preissiana, Eucalyptus rudis* subsp. *rudis, Pteridium esculentum*	*Melaleuca preissiana*		Unknown Veg Class
97360	*Diuris purdiei*	T	1	SWAN COASTAL	PRI	30973	N	Burnt summer '84		SAND	WHITE	*Melaleuca preissiana, Leptospermum ellipticum, Hypocalymma, Xanthorrhoea preissii*	*Melaleuca preissiana*		Unknown Veg Class
97361	*Diuris purdiei*	T	1	SWAN COASTAL	LGA	30973	N	Burnt summer '84		SAND	WHITE	*Melaleuca preissiana, Leptospermum ellipticum, Hypocalymma, Xanthorrhoea preissii*	*Melaleuca preissiana*		Unknown Veg Class
99183	*Dodonaea hackettiana*	4	4	SWAN COASTAL	PRI	29509	N								
99184	*Dodonaea hackettiana*	4	4	SWAN COASTAL	LGA	29509	N								
99185	*Dodonaea hackettiana*	4	4	SWAN COASTAL	NON	29509	N								
99186	*Dodonaea hackettiana*	4	4	SWAN COASTAL	NON	29509	N								
99187	*Dodonaea hackettiana*	4	4	SWAN COASTAL	CC	29509	N								
99189	*Dodonaea hackettiana*	4	5	SWAN COASTAL	LGA	29509	N	Sand with outcropping limestone.	OUTCROP	SAND		*Banksia*	*Banksia*		
99190	*Dodonaea hackettiana*	4	5	SWAN COASTAL	CC	29509	N								
99191	*Dodonaea hackettiana*	4	5	SWAN COASTAL	LGA	29509	N								
99192	*Dodonaea hackettiana*	4	5	SWAN COASTAL	CC	29509	N								

PopId	Taxon	ConsStatus	PopNumber	District	Vesting	CountDate	InFlower	HabNotes	Landform	SoilType	SoilColor	AssSpecies	Veg_domA1	Veg_domA2	Veg_Stru_B
99193	*Dodonaea hackettiana*	4	5	SWAN COASTAL	CC	29509	N								
99194	*Dodonaea hackettiana*	4	5	SWAN COASTAL	PRI	29509	N								
87266	*Dodonaea hackettiana*	4	6	SWAN COASTAL	PRI	29901	N		SLOPE	SAND					
87256	*Dodonaea hackettiana*	4	15	SWAN COASTAL	PRI	31782	N		FLAT	SAND					
87257	*Dodonaea hackettiana*	4	16	SWAN COASTAL	LGA	31943	N								
87264	*Dodonaea hackettiana*	4	23	SWAN COASTAL	PRI	38687	N	DomSp: Victorian Tea Tree	RIDGE	SAND	BROWN	*Melaleuca huegelii, Dryandra sessilis, Templetonia retusa*	*Melaleuca huegelii*		Unknown Veg Class
97391	*Drakaea elastica*	T	2	SWAN COASTAL	PRI	38561	N	Kunzea ericifolia scrub	FLAT	SAND	WHITE	*Banksia attenuata, Banksia menziesii, Banksia illicifolia, Adenanthos cygnorum*	*Banksia attenuata*		tall open shrubland >2m, 20-50%
97392	*Drakaea elastica*	T	2	SWAN COASTAL	PRI	38561	N	Kunzea ericifolia scrub	FL_PLAIN	SAND	GREY	*Banksia attenuata, Banksia menziesii, Banksia illicifolia, Adenanthos cygnorum*	*Banksia attenuata*		tall open shrubland >2m, 20-50%
97393	*Drakaea elastica*	T	2	SWAN COASTAL	PRI	38561	N	Kunzea ericifolia scrub	FL_PLAIN	SAND	GREY	*Banksia attenuata, Banksia menziesii, Banksia illicifolia, Adenanthos cygnorum*	*Banksia attenuata*		tall open shrubland >2m, 20-50%
85072	*Drakaea elastica*	T	29	SWAN COASTAL	COM	38622	N	Banksia woodland with Kunzea thickets	FLAT	SAND	WHITE	*Banksia menziesii, Banksia attenuata, Kunzea glabrescens*	*Banksia menziesii*		Unknown Veg Class
85074	*Drakaea elastica*	T	31	SWAN COASTAL	PRI	40407	N	Banksis sp., Calothamnus sp., Conostylis sp., grasses (interpreted from photo).	FLAT	SAND	WHITE	*Banksia attenuata, Kunzea glabrescens, Adenanthos cygnorum, Hibbertia hypericoides*	*Banksia attenuata*		Unknown Veg Class
86880	*Jacksonia sericea*	4	8	SWAN COASTAL	LGA	33190	N	Open low woodland A of E. marginata - E. calophylla or open low woodland B of B. attenuata - B. menziesii.	FLAT	SAND	GREY	*Eucalyptus marginata, Eucalyptus calophylla, Banksia attenuata, Banksia menziesii*	*Eucalyptus marginata*		low open woodland <10m, 0. 25-20%
93724	*Tripterococcus* sp. *Brachylobus (A. S. George 14234)*	4	12	SWAN COASTAL	PRI	33225	Y		FLAT	CLAY_SND	GREY	*Banksia littoralis, Pericalymma ellipticum, Nuytsia floribunda, Adenanthos obovatus*	*Banksia littoralis*		Unknown Veg Class
93725	*Tripterococcus* sp. *Brachylobus (A. S. George 14234)*	4	13	SWAN COASTAL	NON	33655	N	Winter wet flats, peaty sand over clay.		CLAY_SND		*Hypocalymma angustifolium*	*Hypocalymma angustifolium*		
93727	*Tripterococcus* sp. *Brachylobus (A. S. George 14234)*	4	15	SWAN COASTAL	PRI	36240	N	Open spreading shrub 60 x 60 cm. Flowers yellow, leafless at flowering		SAND	WHITE	*Hypocalymma angustifolium, Euchilopsis linearis, Dasypogon bromeliifolius*	*Hypocalymma angustifolium*		Unknown Veg Class
92664	*Verticordia lindleyi* subsp. *lindleyi*	4	22	SWAN COASTAL	LGA	33404	N								

WA Herbarium Database Search Results

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes
Acacia lasiocarpa var. bracteolata long peduncle variant (G. J. Keighery 5026)	1		Black sandy swampy area.	Jarrah.		
Amanita carneiphylla	3			Under Eucalyptus marginata.		Murdoch University Forest
Amanita carneiphylla	3					
Amanita carneiphylla	3			Under Eucalyptus marginata, P. pinaster.		Murdoch University Forest
Amanita carneiphylla	3		In deep yellow/white sand. Flat firebreak.	Banksia woodland with Eucalyptus marginata, Pinus pinaster.		
Amanita carneiphylla	3	Mode of Life: unknown.		Eucalyptus marginata.		
Amanita carneiphylla	3	Mode of Life: unknown.		Eucalyptus marginata.		
Amanita carneiphylla	3	Mode of Life: unknown.		Eucalyptus marginata.		
Amanita carneiphylla	3	Pileus 52-77 mm diameter, 6-10 mm thick, white, convex becoming plane, margin appendiculate, surface dry; context white bruising pale pink. Universal veil on pileus white, as large conical warts over the whole disc, adnate. Lamellae very pale rose (7A2).	Sand.	Degraded native bush. Nearby woody plants: Eucalyptus marginata.	collection.	
Amanita carneiphylla	3	Pink gills, pale cream to pure white.	In heavy sand.	With Eucalyptus marginata and Pinus pinaster.		VTMH 2 Sporeprint.
Amanita carneiphylla	3	Single basidiome.	In sand.	Degraded native vegetation with Pinus pinaster.		
Amanita carneiphylla	3	Pileus 50-83 mm diameter, white, convex when young applanate when mature, margin appendiculate when young, no smell, context white. Universal veil on the pileus: as large, soft white warts, adnate. Lamaellae: clay pink, close, margin is very slightly fim	Emerging from deep sandy soil.	With nearby degraded native vegetation and introduced Eucalypts.		Microscopic character details housed with specimen.
Amanita carneiphylla	3	Pileus 50-115 mm diameter, white, convex when young applanate when mature, margin appendiculate when young, no smell, context to 10 mm thick, white. Universal veil on the pileus: as large, white warts, mainly in the centre. Lamaellae: adnate, pale rose p	Sandy soil. Emerging from deep sand.	With nearby degraded native vegetation and introduced Eucalypts.	collection, gregarious and scattered.	
Amanita carneiphylla	3	Characterised by 1. pale pink gills, 2. long, ventricose, radicating white stem, with pendulous white striate superior annulus, 3. white cap with white, flat and sometimes conical warts, 4. sits mainly below the surface and can usually be seen only as a		Eucalyptus marginata.		
Amanita carneiphylla	3	Immature, only a few spores seen: [20/1] ex lamella mean 12. 0 x 5. 6 um, Q=2. 14, range (9. 5-) 11-13 x 5-6 (-6. 5) um, Q: (1. 73-) 1. 83-2. 60. Marginal cells: up to 50 um long x 15 um wide, clavate, ovoid, pyriform, colourless, thin walled. Clamps abundant. H	Emerging from deep sand.	Degraded native vegetation, species of plants nearby: Eucalyptus marginata, Pinus pinaster.		

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes
Amanita carneiphylla	3	Spores [15/1] ex lamella, mean 11. 1 x 5. 6, Q=2. 00, range: (9-) 10-12 (-12. 5) x 5-6 (-6. 5), Q: (1. 8-) 1. 82-2. 20 (-2. 40). Clamps abundant. Habit: single basidiome.		Degraded native vegetation, species of plants nearby: Eucalyptus marginata.		Badly chewed by insects.
Amanita carneiphylla	3	Immature, no spores seen, clamp abundant. The universal veil on the pileus is composed of both inflated cells in short chains and filamentous hyphae. These hyphae and cells have a more or less anticlinal orientation, but there is also a lot of interweavi	Emerging from deep sand.	Degraded native vegetation, species of plants nearby: Eucalyptus marginata. Pinus pinaster.		
Amanita drummondii	3		In sandy soil.	Wet eucalpt woodland, nearby Corymbia calophylla.		GenBank KF803241.
Amanita drummondii	3	Pileus 50 mm diameter, hazel in centre, paler towards the margin (5-6D4), 4 mm thick, striate margin (6/25), surface slightly tacky when moist, no smell. Universal veil on pileus a pale vinaceous buff (5B3) submembranous, adnate, patch in the centre. Lam	Eucalypt woodland.	Nearby woody plants: Eucalyptus marginata, Jacksonia furcellata.	single specimen.	
Amanita fibrillopes	3		In soil under [E.] rudis.	Eucalyptus rudis woodland.	several, one collected.	
Amanita fibrillopes	3		In soil under Marri.	Marri/paperbark woodland.		
Amanita fibrillopes	3		In leaf litter, in sandy soil.	Eucalypt/paperbark woodland, nearby Corymbia calophylla and Melaleuca preissiana.		
Amanita fibrillopes	3		In leaf litter, in sandy soil.	Eucalypt/paperbark woodland, nearby Corymbia calophylla and Melaleuca preissiana.		
Amanita fibrillopes	3	Large collection of all ages.		Eucalypt/paperbark woodland with Banksia ilicifolia and B. attenuate; nearby trees and other woody plants: Corymbia callophylla and Melaleuca preissiana.		
Amanita fibrillopes	3	Pileus 76 mm diameter, white with very pale pink flush, plane with decurved margin, margin not striate, slightly appendiculate. Universal veil on pileus as small straight sided warts over whole of the disc, adnate, floccose, white. Lamellae white, free,		Degraded eucalypt woodland with Corymbia calophylla.	one.	
Amanita preissii	3	Pileus 50-60 mm diameter, white, plane with decurved margin, dry, margin not striate, appendiculate. Universal veil on pileus as a thin, floccose layer over whole of disc, ivory white (B), adnate. Lamellae ivory white (B), adnexed, 6 mm broad, margin con		Jarrah/marri/banksia woodland. Eucalyptus marginata, Hibbertia hypericoides.	two.	
Amanita preissii	3	Mode of Life: unknown.		Eucalyptus marginata.		
Amanita preissii	3					
Amanita preissii	3	Pileus to 40-65 mm diameter, white, convex when young becoming plane, smooth, slightly viscid, margin appendiculate when young. Universal veil on pileus of small thin patches in		Eucalypt plantation. Nearby woody plants: Eucalyptus marginata.	collection.	

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes
		centre of disc, ivory white (B). Lamellae ivory white (B), adnexed. Stipe 75				
Amanita preissii	3					
Amanita preissii	3		In deep sandy soil.	Under Eucalyptus marginata and Pinus pinaster.		
Amanita preissii	3		In deep sandy soil.	Under Eucalyptus marginata and Pinus pinaster.		Sporeprint. The collection date is incorrect. It should be 7 May 1989. E. M. Davison 24/05/2017. Duplicate at VPI as VTMH 18.
Amanita preissii	3	Pileus 25-75 mm diameter, Ivory white (B), plane, smooth, slightly viscid, margin appendiculate with remains of partial veil that age saffron. Universal veil on pileus of small to large warts in centre of disc, initially white, aging saffron. Lamellae iv		Eucalypt plantation. Nearby woody plants: Eucalyptus spp.	collection.	ITS sequences Genbank JX398317, nuLSU not yet deposited.
Amanita preissii	3	Pileus to 74 mm diameter, Ivory white (B), convex when young becoming plane, smooth, viscid when moist, margin appendiculate. Universal veil on pileus of small thin patches in centre of disc, initially ivory white (B), aging saffron. Lamellae ivory white		Eucalypt plantation. Nearby woody plants: Eucalyptus spp.	collection.	ITS sequence Genbank JX398318, nuLSU, BTUB, EF not yet deposited.
Amanita preissii	3	Pileus 83 mm diameter, cream (C, pale 3A2), plane with decurved margin and slightly raised centre, margin not striate, appendiculate. Universal veil on pileus crustose, thin, as small soft floccose warts, adnate, white. Lamellae cream (D, 3A2-4A2), narro		Banksia/eucalypt woodland with Kunzea ericifolia, Acacia pulchella, Eucalyptus marginata.	one.	
Amanita preissii	3	Pileus 70 mm diameter, ivory white (B) (4A2), plane with slightly decurved margin, margin slightly appendiculate, slight chlorine smell especially from the bulb, context white, unchanging. Universal veil on pileus ivory white (B) (4A2), as small soft war	Suburban reserve.	Near Corymbia calophylla.	single specimen.	
Amanita preissii	3	Pileus 42, 48 mm diameter, white, convex, margin appendiculate, no smell, context white, unchanging. Universal veil on pileus ivory white (B), as a thin patch over the central two thirds of the disc, felted. Lamellae ivory white, to 4 mm broad, narrowly		Degraded native vegetation with Eucalyptus marginata.	two.	
Amanita quenda	1	Pileus 40, 50 mm diameter, 4 mm thick, pale vinaceous buff (pale 5B2) white at margin, convex becoming plane, margin not appendiculate, surface slightly tacky, context white. Universal veil on pileus white, as small straight sided warts mainly in the cen	Sand.	Moist eucalypt wetland. Nearby woody plants: Kunzea ericifolia.	two.	
Amanita quenda	1		In sandy soil.	Paperbark/Eucalyptus rudis/Kunzea peaty swamp.		ABRS5. GenBank KP137063.
Amanita quenda	1		Amongst Kunzea bushes.	Kunzea, Eucalyptus rudis woodland.		

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes
Amanita quenda	1		At base of Astartea bushes.	Paperbark/Eucalhyptus rudis/Astartea peaty swamp.		
Amanita quenda	1		In sandy soil.	Kunzea bush.	3 collected.	
Amanita quenda	1		In sandy soil.	Kunzea bush.	single specimen.	
Amanita wadjukiorum	3	Pileus 45, 60 mm diameter, clay buff, plane, surface viscid when moist. UV on pileus smoke grey, breaking up into thin small patches, adnate. Lamellae white, adnexed, to 6 mm broad, lamellulae truncate and attenuate, frequent. Stipe total length 85, 105	Sandy soil.	Small plantation of exotic and local eucalypts. Nearby woody plants: eucalypts.	two.	
Amanita wadjukiorum	3	Pileus 90 mm diameter, milky coffee (5D4-6D4), plane with depressed centre and upturned margin, dry, margin not striate, appendiculate. Universal veil on pileus as large straight sided warts in centre of disc, vinaceous buff (6B2), adnate. Lamellae cream		Jarrah/marri/banksia woodland. Eucalyptus marginata, Corymbia calophylla.	one.	
Amanita wadjukiorum	3		In leaf litter.	Under Allocasuarina fraseriana.		
Amanita wadjukiorum	3					This specimen was previously databased as PERTH 03097099.
Amanita wadjukiorum	3		In sand covered with wood chips.	Nearby Corymbia calophylla and C. citriodora.		
Amanita wadjukiorum	3		In sand covered with wood chips.	Nearby Corymbia calophylla and C. citriodora.		
Amanita wadjukiorum	3		In sand covered with wood chips.	Nearby Corymbia calophylla and C. citriodora.		
Amanita wadjukiorum	3	Pileus 85, 90 mm diameter, 5 mm thick, vinaceous buff paler at margin (5C3-6C3), plane with depressed centre and slightly decurved margin, margin appendiculate, surface slightly tacky, context white. Universal veil on pileus white becoming vinaceous buff	Sand.	Eucalypt/banksia woodland. Nearby woody plants: Corymbia calophylla, Banksia attenuata.	two.	
Amanita wadjukiorum	3		In soil.	Remnant vegetation.		
Amanita wadjukiorum	3	Pileus 67 mm diameter, 7 mm thick, snuff brown (6E5-6), margin appendiculate, surface dry, no smell, context white, grey beneath the centre of the pileus. Universal veil on pileus milky coffee/clay buff (6D3), as small thin patches over the central half	Degraded native vegetation.	Nearby woody plants: Corymbia calophylla.	single specimen.	
Amanita wadjukiorum	3	Pileus 82 mm diameter, 6 mm thick, vinaceous buff (5B2), paler at margin, margin appendiculate, surface dry, mushroom smell, context white. Universal veil on the pileus pale smoke grey/vinaceous buff (5C2), crustose, breaking into flat patches and a few	Degraded native vegetation.	Nearby woody plants: Jacksonia furcellata, Corymbia citriodora, Melaleuca.	single specimen.	
Amanita wadjukiorum	3	Pileus 61-87 mm diameter, pale vinaceous buff 5-6B2, appendiculate margin, surface slightly tacky when moist. Universal veil on pileus smoke grey to pale drab 5C-D2, initially crustose		Degraded native vegetation. Nearby woody plants: Eucalyptus marginata, Banksia attenuata, Xanthorrhoea preissii.	collection.	

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes
		developing as soft, conical warts mainly in the centre. Lamellae ivor				
Amanita wadjukiorum	3	Pileus 55 mm diameter, 5 mm thick, milky coffee (6D4), plane with a slightly depressed centre, surface very slightly tacky, context white. Universal veil on pileus vinaceous buff (5C3) as soft low warts mainly in the centre, adnate. Lamellae ivory B, nar	Sand.	Eucalypt/banksia woodland. Nearby woody plants: Corymbia calophylla.	one.	
Amanita wadjukiorum	3	Pileus 57 mm diameter, milky coffee (6D4-5), plane with slightly depressed centre and decurved margin, surface slightly tacky when moist. Universal veil on pileus 6C3, as soft low warts and patches mainly in the centre, adnate. Lamellae cream (very pale	Sand.	Eucalypt/banksia woodland. Nearby woody plants: Corymbia calophylla.	one.	
Amanita wadjukiorum	3		In woodchips near Eucalypts.	Degraded native vegation.		
Amanita wadulawitu	2					
Amanita wadulawitu	2					
Amanita wadulawitu	2					
Amanita wadulawitu	2					
Amanita wadulawitu	2					
Amanita wadulawitu	2					
Amanita wadulawitu	2	Cap: 77 mm in diameter, planar, white, margin smooth, cap surface has tiny pointed warts over most of it, these are grey probably stained from the sandy soil. Gills: Convex, adnate, 3 sets of lamellulae, cream, margin smooth (x 10 lens). Stipe: Robust, 2	Growing in sand.		3 fruiting bodies.	When cut the flesh had areas of grey bruising.
Amanita wadulawitu	2	Cap: 91 & 71 mm in diameter, white but stained and encrusted with soil, almost entirely covered with tiny flat white warts, margin smooth, not noticeably appendiculate. Caps are planar, gills are upraised. Gills: Creamy white, adnexed pulling free, 3 set	Growing in sand.	Under Eucalyptus marginata.	two fruiting bodies found.	
Amanita wadulawitu	2	Cap: 85, 60 & 36 mm in diameter, white to cream in colour but heavily stained with soil, margin not striate nor appreciably appendiculate, densely covered with tiny pointed warts at the cap centres interspersed with scattered flat white scraps these are	Growing in sand.	Near mixed eucalypts.	three fruiting bodies.	
Amanita wadulawitu	2	Cap: 59 mm in diameter, planar, incurved margin, dirty white scraps of UV all over cap but most densely packed at the centre. Gills: Adnate pulling free, 3 sets of lamellulae, margin fimbriate (x 10 lens). Stipe: Almost all of length was beneath the leve	Growing in sand.		single fruiting body.	
Amanita wadulawitu	2	Macroscopic characters: Pileus: 90 mm, white, plane, margin appendiculate, non-sulcate, surface slightly viscid, context white, 14 mm thick in centre, slight mustard smell. Universal	In deep sand.	Near Corymbia calophylla.		

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes
		veil on pileus: white, friable covering the whole pileus, adnate. Lamel				
Amanita wadulawitu	2	Macroscopic characters: Pileus: 47-105 mm, white, 9-16 mm thick in centre, plane becoming slightly depressed with age, margin slightly appendiculate, non-sulcate, context white becoming pale vinaceous buff (5B2) in centre in old specimens after cutting,	In deep sand.	Under Corymbia calophylla.		
Amanita wadulawitu	2	Pileus 50-80 mm diameter, white, appendiculate margin, covered with white, felty universal veil which is breaking into small patches. Lamellae white, adnate, crowded. Stipe total length 120-140 mm, to 25 mm thick, white, with a superior, soft descendant,	Degraded native vegetation.	Nearby woody plants: Eucalyptus spp.	collection.	
Amanita wadulawitu	2					
Amanita wadulawitu	2					
Amanita wadulawitu	2	(i) fusoid, turnip-like stem with large, adhering apical, striate annulus; (ii) overall white to cream colours; (iii) occuring deeply buried in the sand. Pileus: to 70mm diameter; flat-convex with incurved, thick margin, finally expanding to become sligh	Deeply buried in sand.	Eucalyptus marginata.		
Amanita wadulawitu	2					
Amanita wadulawitu	2					
Amanita wadulawitu	2					
Amanita wadulawitu	2					
Amanita wadulawitu	2	Cap: 69, 65 & 42 mm in diameter, slightly upturned, margin not striate nor appreciably appendiculate, caps white, there are tiny pointed warts densely packed at the cap centres, towards the margins there are sparsely scattered flat white scraps. Gills: W	Growing in sand.	Near mixed eucalypts.	three fruiting bodies.	
Amanita wadulawitu	2	Pileus 57-92 mm diameter, initially white becoming very pale 5B2, very pale buff with age, convex becoming plane with depressed centre, margin slightly appendiculate when young, no smell, context white, unchanging. Universal veil on pileus white becoming		Eucalypt plantation, near Corymbia calophylla.	collection.	
Amanita wadulawitu	2					
Angianthus micropodioides	3		saline sandy soil alongside river estuary just above high tide mark			
Angianthus micropodioides	3	Erect annual herb, 5 cm high. Flowers yellow.	Edges river. Saline sandy clay over clay.	Succulent shrubland (Halosarcia).		Abundance: very common.
Angianthus micropodioides	3		Saline soil along river bank.			
Austrostipa mundula	3	Caespitose perennial grass.	In sand over limestone.			
Austrostipa mundula	3					
Beyeria cinerea subsp. *cinerea*	3					

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes
Beyeria cinerea subsp. *cinerea*	3		On limestone flat above drive.			
Beyeria cinerea subsp. *cinerea*	3	Spreading much branched shrub, 20 cm high x 40 cm wide. Flowers yellow, largely in bud. Male plants.	Hilltop. Grey sand over limestone.	Melaleuca systena / Olearia axillaris / Beyeria cinerea low heath.	locally common. 57 female, 49 male plants in site.	
Beyeria cinerea subsp. *cinerea*	3	Spreading open twiggy shrub, 30 cm high x 30 cm wide. Flowers green. Female plant, much less branched than male.	Hilltop. Grey sand over limestone.	Melaleuca systena / Olearia axillaris / Beyeria cinerea low shrubland.	locally common. 57 female, 49 male in site.	
Bossiaea modesta	2		Flat, valley. Moist clay.	Acacia extensa, Agonis linearifolia, Astartea fascicularis, Melaleuca incana, Mirbelia dilatata, Xanthorrhoea gracilis, X. preissii, Thomasia paniculata, Gahnia decomposita, Lepidosperma squamatum.	2 plants.	
Caladenia huegelii	T	To 80 cm tall, one with two flowers, no odour.	In grey sand on gently undulating terrain.	Low woodland - low forest over scrub and heath; Banksia attenuata, B. menziesii, B. ilicifolia, Allocasuarina fraseriana, Eucalyptus todtiana, E. marginata over Adenanthos.		Abundance: four plants in full flower.
Caladenia huegelii	T		Sand.	Open low woodland, heath; Eucalyptus marginata, Casuarina fraseriana, Banksia attenuata, B. ilicifolia over heath of Melaleuca.	2 plants.	
Caladenia huegelii	T		In sandy soil.	Jarrah - Banksia woodland.		
Caladenia huegelii	T		In sand.	Open low woodland, heath; Eucalyptus marginata, Casuarina fraseriana, Banksia attenuata, B. ilicifolia over heath of Melaleuca.		
Caladenia huegelii	T	Up to 60 cm high.	Coastal plain. Grey sand.	Closed Banksia woodland. Banksia sp., Stirlingia latifolia, Hibbertia spp ., Hypocalymma robustum, Conostephium pendulum		Abundance: 23 plants flowering. Plants found only in 'depression' ca 50 m x 75 m.
Caladenia huegelii	T	Up to 60 cm high.	Coastal plain. Grey sand.	Closed Banksia woodland. Banksia sp., Stirlingia latifolia, Hibbertia spp ., Hypocalymma robustum, Conostephium pendulum		Abundance: 23 plants flowering. Plants found only in 'depression' ca 50 m x 75 m.
Caladenia huegelii	T	Ca 30 cm tall. Linear hairy leaf 15 cm x 1 cm.	Grey sand.	Low open woodland of Melaleuca preissiana over Low Open Shrubland of Melaleuca thymoides over Dasypogon sp. and Desmocladus sp. herbland on lower slopes.	2 mature plants, one dead over 2 sq m.	Condition of population: healthy.
Caladenia huegelii	T	Perianth greenish yellow with pale red markings; labellum white at base; maroon in upper half; fringe greenish yellow.				
Caladenia huegelii	T		Deep grey sand soil.	Banksia attenuata, B. menzesii, Allocasuarina fraseriana woodland over low shrubs and annuals.	35+ plants.	
Caladenia huegelii	T		Private land. Flat. White / grey sand.		452 mature plants.	Healthy population but at risk from disturbance given location and proximity to sand.

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes
Calothamnus graniticus subsp. *leptophyllus*	4	Shrub, 1. 8 m high.	Slope above river with underlying limestone.	Shrubs beneath Eucalyptus calophylla.	ca 12 plants of varying sizes over ca 200 m.	Possibly planted.
Cyathochaeta teretifolia	3	Tufted rhizomatous herb, 1 - 2 m high x 1 - 2 m wide. In fruit, about 20% flowered last year.	Flow line in swamp with black peaty sand.	Melaleuca preissiana low forest over Cyathochaeta teretifolia tall sedgeland.	locally abundant.	
Cyathochaeta teretifolia	3					
Dampiera triloba	3	Shrub.	Coastal plain. Damp peaty sand.			
Dampiera triloba	3	Erect shrub.	Sand: grey with high organic matter. Near edge of track (high tension power lines).	Assoc. with Kunzea ericifolia.		
Dampiera triloba	3	Erect spreading branched herb to 30 cm tall. Leaves clustered. Plants flowering at the time of collection. Purple.	Dark brown/black peaty soils.	Low woodland to open forest of Eucalyptus rudis, Banksia attenuata and Melaleuca preissiana. Low open shrubland of Taxandria linearifolia, Gastrolobium ebracteolatum and Pteridium. Closed sedgeland of Baumea sp.	1 mature plant.	Project: 3516.
Dampiera triloba	3	Compact, prostrate, perennial herb, 40 cm high x 1 m wide. Blue flowers.	Wetland. Reserve. Grey loam.	Tall trees with Melaleuca preissiana and Corymbia calophylla and sedges.	21 - 50 plants.	Population structure: 50% flowering.
Diuris drummondii	T		Burnt swamp.			
Diuris drummondii	T					
Diuris drummondii	T					
Diuris micrantha	T					
Diuris micrantha	T	Plants tall, flowers very small, yellow with red-brown markings.	Swamp. Black peaty soil.	Miscellaneous rushes and sedges.		
Dodonaea hackettiana	4					
Dodonaea hackettiana	4	Shrub 2. 5 m high. Fruit red/green.	Grey sand.			
Dodonaea hackettiana	4					
Dodonaea hackettiana	4					2159/62/2.
Dodonaea hackettiana	4	Erect shrub, 2 m high, variable age structure.	Disturbed area, in sandy paddock.	Eucalyptus marginata open forest, with grasses, Carpobrotus sp.		Abundance: large population, dominant shrub. (Within population 3262-3267).
Dodonaea hackettiana	4	Erect shrub, 1 m high, variable age structure.	Disturbed area, in sandy paddock.	Eucalyptus marginata open forest, with grasses, Carpobrotus sp.		Abundance: large population, dominant shrub. (Within population 3262-3267).
Dodonaea hackettiana	4	Erect shrub, of small tree, 4 - 5 m high.	Sand with outcropping limestone.	Tall danse Banksia forest.		(Within population 3268-3271).
Dodonaea hackettiana	4	Erect shrub, ca 1. 5 m high.	Level, but disturbed sand.		rare.	
Dodonaea hackettiana	4	Tall shrub 3 m high x 1-1. 5 m wide.	Flat, leaf litter, grey sand over limestone.	Eucalyptus rudis, Banksia sp.	rare, localised.	
Dodonaea hackettiana	4	Large erect shrub 3 m high. Some plants with red/green fruits. Some seedlings.	North facing slope of limestone ridge. Brown Spearwood sand overlying limestone.	Melaleuca huegelii shrubland dominated by Dryandra sessilis, minor Templetonia retusa and Victorian Tea Tree.	c. 20 plants scattered in immediate vicinity.	
Dodonaea hackettiana	4	Shrub 2 m high.	Grey sand.	Banksia menziesii, B. attenuata, B. ilicifolia low open forest over Dodonaea hackettiana, Xanthorrhoea preissii over Dasypogon bromeliifolius open sedgeland. Associated species: Leptospermum erubescens.	10 within a 100 square metres.	

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes
Drakaea elastica	T		In deep grey sand on gradual slopes in undulating plain.	Low woodland of Banksia attenuata, B. menziesii, B. ilicifolia, and Jarrah over scrub of Adenanthos cygnorum and Kunzea over herbs.	ca 60 plants.	
Drakaea micrantha	T		Alongside winter wet swamp in sand.	Growing in Casuarina and Banksia woodland with Eucalyptus marginata and E. calophylla.	five plants, only two in flower.	
Grevillea olivacea	4	Open erect shrub 1-2 m, style red; perianth green-red.	Coastal dunes. White sand.	Coastal Acacia shrubland.		Self seeding from plantings.
Grevillea thelemanniana	T					Host No. 47
Hibbertia leptotheca	3					
Hibbertia leptotheca	3					
Hibbertia leptotheca	3					
Hibbertia leptotheca	3					B. 2588
Hibbertia leptotheca	3	Glabrous form.				
Hibbertia leptotheca	3					
Hibbertia leptotheca	3					
Hydrocotyle lemnoides	4	Floating in pools.	In pools c. 30-40 cm deep.			
Hydrocotyle striata	1					
Jacksonia gracillima	3	Low spreading semi-prostrate shrub, buds and flowers, flowers orange.	Flat ground, grey and brown sand over ?sand, well drained.	Low Forest A, Associated species: Allocasuarina fraseriana, Banksia menziesii.		
Jacksonia gracillima	3	Decumbent perennial to 0. 3 m high x 1. 4 m diam.	Flat, well-drained but adjacent to winter-wet swamp; pale grey sand.	Banksia woodland.	infrequent.	
Jacksonia sericea	4					
Jacksonia sericea	4					
Jacksonia sericea	4	Prostrate shrub.	Grey sand over limestone.	Shrubland and woodland.		Abundance: abundant
Jacksonia sericea	4	Prostrate shrub, buds and orange flowers.				
Jacksonia sericea	4					
Jacksonia sericea	4	Low spreading shrub, silvery sericeus, in bud at the time of collection.	Grey, white sandy loam.	Low woodland to open forest of Banksia attenuata and Melaleuca preissiana. Banksia menziesii also common in the site.	1 mature plant.	Project: 3515.
Kennedia beckxiana	4	Vigorous climbing shrub with twining stems climbing up a Melaleuca preissiana tree to a height of about 4 m. Glabrous leaves divided into 3 leaflets. Inflorescence stalked with obvious amplexicaule bract. Showy orange-red flowers, most still in bud but s	Poorly drained flat at edge of lake. Black loamy sand. Litter cover 20%, depth <1 cm. Moss cover 50%. Bare ground cover 20%.	Melaleuca preissiana Low Woodland, over an Open Tall Shrubland of Acacia longifolia and Kunzea glabrescens, over an Open Shrubland of Solanum nigrum, Climbers of Kennedia beckxiana and Fumaria sp., a Fernland of Pteridium esculentum, an Open Grassland of	Two plants present.	Plant is to be removed as it is invading native bushland where it is not a local native.
Lachnagrostis nesomytica subsp. *paralia*	1	Small upright grass 30 cm high.		Callitris forest.		
Lachnagrostis nesomytica subsp. *paralia*	1	Annual grass, 50 mm high x 150 mm wide.	Disturbed soil. Plain. Reserve. Dry grey/brown sand. Dune beside sea.	Medium trees. With scattered Melaleuca lanceolata, Parapholis incurva, Trachyandra divaricata, Geranium molle, Cotula and Euphorbia spp ., and grasses.	2-5 plants.	

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes
Lachnagrostis nesomytica subsp. *paralia*	1	Grass, 0. 15 m high x 0. 03 m wide.	Reserve. Dune swale. Dry white soil.	With Nicotiana glauca, Callitris preissii and Solanum symonii.	over 50 plants in 11-100 sq m.	
Lepidium puberulum	4			Burnt area, regenerating. Melaleuca/Acacia communities.		
Lepidium puberulum	4	Erect annual herb, flowers greenish - inconspicuous.	Mossy black sand over calcareous white sand.	Callitris preissii low forest over moss.		Abundance: common in area
Lepidium puberulum	4	Annual herb 0. 2 m high x 0. 1 m wide.	Dune. Recent soil disturbance. Dry, white sand.	Medium trees, Melaleuca lanceolata, Trachyandra, Acanthocarpus.	21-50 plants.	
Lepidium puberulum	4	Erect herb. Height: 150 mm and width: 100 mm. Flower colour: green.	Topography: lawn on sand bench. Collection site: enclosure. Soil colour: brown. Soil: sand.	Associated vegetation: lawn like area with weeds. Characteristic species: Stenotaphrum, Euphorbia, Erodium, Anagallis, Hypochaeris, Trachymene.	2-5 plants.	
Lepidium puberulum	4	Erect annual herb. Flowes greenish - white; in fruit and flower.	Mossy black sand.	Callitris preissii low woodland.	locally very common.	GARD Q3.
Lepidium puberulum	4	Delicate herb to <0. 05 m; clusters of tiny flowers.	Site slopes gently to the W; dark brown sand; well drained.	Heath A/B of Acacia rostellifera and Leucopogon australis over Low Heath C/D of Acanthocarpus preissii and Eremophila glabra; Very Open Herbs of Zantedeschia aethiopica, Trachymene coerulea; Very Open Low Sedges of Carex preissii.		Vegetation noted as being in excellent condition with some mature Acacia deaths.
Levenhookia preissii	1	Erect, compact, annual herb, branched 3 times. 100 mm high x 45 mm wide. Flowers pink.	Wetland. Reserve. Dry grey sand.	Tall shrubland. Associated species: Hypocalymma angustifolium, Melaleuca seriata and Regelia ciliata.	one plant only.	Population structure: 100% flowering.
Microtis quadrata	4		In black peaty soil.	Under paperbarks.		
Myosotis australis	4	Flowers white.				
Myosotis australis	4	Erect annual herb 20 cm. Flowers white.				
Phlebocarya pilosissima subsp. *pilosissima*	3		Sand ridge.	In Banksia woodland.		
Pimelea calcicola	3	Low spreading shrub 20-30 cm high. Flowers pale pink.	Low rises. Grey sand, calcareous/limestone.	Low heath.		Abundance: very common.
Pimelea calcicola	3					
Pimelea calcicola	3					
Pimelea calcicola	3	Erect, perennial, dwarf shrub.	Brown sand and protruding limestone.	Melaleuca/Acacia rostellifera patches. Associated vegetation: Dryandra sessilis, Phyllanthus calycinus, Hibbertia hypericoides, Ehrharta calycina.		
Pimelea calcicola	3	Shrubs 0. 3-0. 5 m in height. Calyx white, flushed with pink in the distal 1/4.		Remnant heath vegetation composed mostly of Dryandra sessilis, Hakea prostrata, Acanthocarpus preissii and Melaleuca spp.	occasional.	
Stylidium longitubum	4	Ephemeral herb, flowers pink.				
Stylidium maritimum	3					
Stylidium paludicola	3	0. 5 m tall, flowers pink.	Near edge of swamp.	Amongst Juncus.		
Stylidium paludicola	3		Swamp.	Under Melaleuca preissii.		
Stylidium paludicola	3	Herb to 0. 4 m high. Flowers pink/red.	Gentle slope, south aspect, surface soil is dark grey loamy sand and sub surface soil is very dark grey brown sandy loam,	Melaleuca preissiana, Kunzea glabrescens low open forest over Astartea scoparia, Hypocalymma angustifolium open shrubland over Lepidosperma	scattered.	

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes
			drainage is poor and wet during winter and spring only.	longitudinale open sedgeland. Vegetation is in a pristine to excellent condition with some rabbit diggings and pot		
Stylidium paludicola	3		In swampy area.			
Stylidium paludicola	3	Upright herb 60-75 cm high x 5 cm wide. Pink trigger plant. Linear basal leaves in tufts 20-60 mm. One stem or stolon with rosette of leaves 35 cm up stem.	Dry swamp, sand. Fire previous summer.	Paperbark swamp. Melaleuca preissiana, sedges.	2-3 plants.	
Styphelia filifolia	3	Erect shrub, 60 cm high x 40 cm wide. Flowers white, spreading - pendulous. Plant single stemmed at ground level.	Coastal plain, winter damp. Dry, litter soil surface.	Open Low Woodland B over Dense Thicket (Muir 1977) with Melaleuca preissiana, Regelia ciliata and Pericalymma ellipticum.	occasional.	
Styphelia filifolia	3	Erect shrub, to 60 cm high x 60 cm wide. Flowers white, pendulous.	Coastal plain. Dry, littered, grey sand.	Banksia woodland with Banksia attenuata, B. menziesii, B. ilicifolia, Stirlingia latifolia, Bossiaea eriocarpa.	scattered.	Confined to lowest ground with B. ilicifolia.
Styphelia filifolia	3	Erect open shrub, 70 cm high x 50 cm wide. Flowers cream.	Swan coastal plain (Bassendean Sands). Littered grey sand.	Low Woodland A over Low Woodland B over Scrub (Muir 1977). Corymbia calophylla, Banksia attenuata, Adenanthos cygnorum, Kunzea glabrescens, Leucopogon conostephioides, L. oxycedrus flowering in the area.		
Styphelia filifolia	3	Erect shrub to 60 cm high and 60 cm wide. Flowers white, strictly pendulous.	Sandy rise. Dry littered. Grey sand.	Banksia woodland. B. attenuata, B. menziesii, Allocasuarina humilis, Stirlingia latifolia.	scattered.	
Styphelia filifolia	3	Upright shrub 70 cm high and 50 cm wide. Masses of white tubular flowers in upper axils.	Hill slope; grey sand.	Banksia woodland, B. menziesii, Adenanthos cygnorum.	4 plants over large area.	
Styphelia filifolia	3	Open shrub, 60 cm high x 60 cm wide. Flowers white.	Coastal plain. Littered grey sand.	Open Woodland over Low Forest B over Low Heath C over Herb (Muir, 1977). Eucalyptus marginata, Banksia attenuata, Banksia menziesii, Scholtzia involucrata, Phlebocarya ciliata.	occasional.	
Synaphea sp. *Fairbridge Farm (D. Papenfus 696)*	T					Herbarium specimen made from fresh material collected by UWA Botany Dept. technical officer for the second year unit Land Plant diversity practical exam. No collection information available and area not revisited to relocate population.
Thelymitra variegata	2					
Thelymitra variegata	2		In sand.			
Thelymitra variegata	2					
Thelymitra variegata	2					
Thelymitra variegata	2		In yellow sand.	With Banksia attenuata, Casuarina fraseri, Hibbertia hypericoides, etc.		
Thelymitra variegata	2		In sandy soil.			This specimen was collected in September, no year given.

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes
Tripterococcus sp. *Brachylobus (A. S. George 14234)*	4	Slender erect multi-stemmed shrub to 40 cm. Flowers orange-yellow, in full flower.	Winter wet flats, peaty sand over clay.	Hypocalymma angustifolium low heath.	scattered groups of 5-15 plants.	
Tripterococcus sp. *Brachylobus (A. S. George 14234)*	4	Open spreading shrub 60 cm high x 60 cm wide. Flowers yellow. Plant leafless at flowering.	Coastal plain (winter damp). Bare white sand.	Low Heath C (Muir, 77). Hypocalymma angustifolium, Euchilopsis linearis, Dasypogon bromeliifolius.	one only seen.	
Tripterococcus sp. *Brachylobus (A. S. George 14234)*	4	Erect perennial herb, glabrous. Leaves scattered. Flowers pedicellate, in branched inflorescences.	Grey sand, flat.	Melaleuca preissiana open low woodland A with Adenanthos obovata, Periclaymma ellipticum, Hypocalymma angustifolium and Hakea varia.	2 plants recorded.	See. N. Casson Coll. 9/6/1989

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 02/03/2021

Kingdom	Plantae
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	115° 45' 36" E,32° 07' 31" S
Buffer	5km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	249	403
Priority 4	2	4
TOTAL	**251**	**407**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Priority 4					
1.	4763	*Dodonaea hackettiana (Hackett's Hopbush)*		P4	
2.	2054	*Grevillea olivacea (Olive Grevillea)*		P4	
Non-conservation taxon					
3.	3282	*Acacia cyclops (Coastal Wattle)*			
4.	15481	*Acacia pulchella var. glaberrima*			
5.	3525	*Acacia rostellifera (Summer-scented Wattle)*			
6.	3527	*Acacia saligna (Orange Wattle, Kudjong)*			
7.	30032	*Acacia saligna subsp. saligna*			
8.	3584	*Acacia truncata*			
9.	1208	*Acanthocarpus preissii*			
10.	48409	*Acetabularia caliculus*			
11.	4582	*Adriana quadripartita (Bitter Bush)*			
12.	17028	*Ailanthus altissima (Tree of Heaven)*	Y		
13.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
14.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
15.	4906	*Alyogyne huegelii (Lilac Hibiscus)*			
16.	2668	*Amaranthus powellii (Powell's Amaranth)*	Y		
17.	126	*Amphibolis antarctica (Sea Nymph)*			
18.	127	*Amphibolis griffithii*			
19.	6210	*Apium annuum*			
20.	6211	*Apium prostratum (Sea Celery)*			
21.	7838	*Arctotheca calendula (Cape Weed, African Marigold)*	Y		
22.	17797	*Argemone ochroleuca subsp. ochroleuca*	Y		
23.	1364	*Asphodelus fistulosus (Onion Weed)*	Y		
24.	7851	*Asteridea pulverulenta (Common Bristle Daisy)*			
25.	2452	*Atriplex cinerea (Grey Saltbush)*			
26.	17240	*Austrostipa flavescens*			
27.	231	*Avellinia michelii*	Y		
28.	234	*Avena fatua (Wild Oat)*	Y		
29.	1819	*Banksia grandis (Bull Banksia, Pulgarla)*			
30.	32077	*Banksia sessilis var. cygnorum*			
31.	743	*Baumea juncea (Bare Twigrush)*			
32.	7046	*Bellardia trixago (Bellardia)*	Y		
33.	2995	*Brassica x napus*	Y		
34.	244	*Briza maxima (Blowfly Grass)*	Y		
35.	249	*Bromus diandrus (Great Brome)*	Y		
36.	250	*Bromus hordeaceus (Soft Brome)*	Y		
37.	1599	*Caladenia latifolia (Pink Fairy Orchid)*			
38.	17760	*Caladenia nobilis*			
39.	2845	*Calandrinia brevipedata (Short-stalked Purslane)*			
40.	2846	*Calandrinia calyptrata (Pink Purslane)*			
41.	96	*Callitris preissii (Rottnest Island Pine, Maro)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
42.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
43.	2795	*Carpobrotus edulis (Hottentot Fig)*	Y		
44.	7911	*Carthamus lanatus (Saffron Thistle)*	Y		
45.	2951	*Cassytha flava (Dodder Laurel)*			
46.	2957	*Cassytha racemosa (Dodder Laurel)*			
47.	41566	*Cenchrus longisetus (Feathertop)*	Y		
48.	41563	*Cenchrus purpureus (Elephant Grass)*	Y		
49.	41568	*Cenchrus setaceus (Fountain Grass)*	Y		
50.	7915	*Centaurea calcitrapa (Star Thistle)*	Y		
51.	7916	*Centaurea melitensis (Maltese Cockspur, Malta Thistle)*	Y		
52.	6539	*Centaurium erythraea (Common Centaury)*	Y		
53.	2889	*Cerastium glomeratum (Mouse Ear Chickweed)*	Y		
54.	2483	*Chenopodium album (Fat Hen)*	Y		
55.	10804	*Clematis linearifolia*			
56.	4552	*Comesperma confertum*			
57.	4555	*Comesperma integerrimum*			
58.	1427	*Conostylis candicans (Grey Cottonhead)*			
59.	11438	*Conostylis candicans subsp. candicans*			
60.	6611	*Convolvulus arvensis (Field Bindweed)*	Y		
61.	7939	*Conyza bonariensis (Flaxleaf Fleabane)*	Y		
62.	20074	*Conyza sumatrensis*	Y		
63.	17104	*Corymbia calophylla (Marri)*			
64.	3137	*Crassula colorata (Dense Stonecrop)*			
65.	3140	*Crassula glomerata*	Y		
66.	3142	*Crassula natans*	Y		
67.	4802	*Cryptandra mutila*			
68.	10916	*Cyrtostylis huegelii*			
69.	18560	*Daviesia divaricata subsp. divaricata*			
70.	16585	*Daviesia nudiflora subsp. nudiflora*			
71.	16595	*Desmocladus flexuosus*			
72.	1259	*Dianella revoluta (Blueberry Lily)*			
73.	4454	*Diplolaena dampieri (Southern Diplolaena)*			
74.	3011	*Diplotaxis muralis (Wall Rocket)*	Y		
75.	349	*Ehrharta longiflora (Annual Veldt Grass)*	Y		
76.	351	*Ehrharta villosa (Pyp Grass)*	Y		
77.	7215	*Eremophila glabra (Tar Bush)*			
78.	17175	*Eremophila glabra subsp. albicans*			
79.	4332	*Erodium botrys (Long Storksbill)*	Y		
80.	5615	*Eucalyptus decipiens (Limestone Marlock, Moit)*			
81.	5659	*Eucalyptus gomphocephala (Tuart, Duart)*			
82.	29940	*Euphorbia maculata*	Y		
83.	4638	*Euphorbia peplus (Petty Spurge)*	Y		
84.	4648	*Euphorbia terracina (Geraldton Carnation Weed)*	Y		
85.	10765	*Exocarpos sparteus (Broom Ballart, Djuk)*			
86.	32369	*Fissidens tenellus*			
87.	6221	*Foeniculum vulgare (Fennel)*	Y		
88.	5209	*Frankenia pauciflora (Seaheath)*			
89.	2969	*Fumaria capreolata (Whiteflower Fumitory)*	Y		
90.	907	*Gahnia trifida (Coast Saw-sedge)*			
91.	7976	*Galinsoga parviflora (Potato Weed)*	Y		
92.	7323	*Galium murale (Small Goosegrass)*	Y		
93.	20475	*Gastrolobium capitatum*			
94.	20482	*Gastrolobium nervosum*			
95.	12624	*Gnephosis angianthoides*			
96.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
97.	6161	*Gonocarpus pithyoides*			
98.	15839	*Grevillea preissii subsp. preissii*			
99.	32390	*Gymnostomum calcareum*			
100.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
101.	8008	*Helianthus annuus (Sunflower, Common Sunflower)*	Y		
102.	45534	*Hibbertia hypericoides subsp. hypericoides*			
103.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
104.	5825	*Hypocalymma robustum (Swan River Myrtle)*			
105.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
106.	910	*Isolepis cernua (Nodding Club-rush)*			
107.	11922	*Juncus kraussii subsp. australiensis*			
108.	4037	*Kennedia coccinea (Coral Vine)*			
109.	1370	*Lachenalia reflexa*	Y		
110.	20019	*Lachnagrostis filiformis*			
111.	14646	*Lagunaria patersonia*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
112.	467	*Lagurus ovatus (Hare's Tail Grass)*	Y		
113.	27002	*Laurencia forsteri*			
114.	4958	*Lawrencia spicata*			
115.	7580	*Lechenaultia linarioides (Yellow Leschenaultia)*			
116.	925	*Lepidosperma angustatum*			
117.	940	*Lepidosperma pubisquameum*			
118.	29150	*Lepidosperma sp. Margaret River (B.J. Lepschi 1841)*			
119.	945	*Lepidosperma squamatum*			
120.	1078	*Leptocarpus coangustatus*			
121.	15418	*Leptoceras menziesii*			
122.	5850	*Leptospermum laevigatum (Coast Teatree)*	Y		
123.	6427	*Leucopogon parviflorus (Coast Beard-heath)*			
124.	6436	*Leucopogon propinquus*			
125.	4362	*Linum marginale (Wild Flax)*			
126.	6515	*Logania vaginalis (White Spray)*			
127.	478	*Lolium rigidum (Wimmera Ryegrass)*	Y		
128.	1231	*Lomandra maritima*			
129.	1239	*Lomandra preissii*			
130.	4065	*Lupinus angustifolius (Narrowleaf Lupin)*	Y		
131.	6968	*Lycium ferocissimum (African Boxthorn)*	Y		
132.	36480	*Malva arborea (Tree Mallow)*	Y		
133.	36522	*Malva pseudolavatera*	Y		
134.	6881	*Marrubium vulgare (Horehound)*	Y		
135.	4075	*Medicago littoralis (Strand Medic)*	Y		
136.	5900	*Melaleuca cuticularis (Saltwater Paperbark)*			
137.	5920	*Melaleuca huegelii (Chenille Honeymyrtle)*			
138.	13271	*Melaleuca huegelii subsp. huegelii*			
139.	5922	*Melaleuca lanceolata (Rottnest Teatree, Moonah)*			
140.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
141.	18598	*Melaleuca systena*			
142.	5978	*Melaleuca teretifolia (Banbar)*			
143.	4085	*Melilotus indicus*	Y		
144.	2813	*Mesembryanthemum crystallinum (Iceplant)*	Y		
145.	485	*Microlaena stipoides (Weeping Grass)*			
146.	6198	*Myriophyllum salsugineum*			
147.	6974	*Nicotiana glauca (Tree Tobacco)*	Y		
148.	6138	*Oenothera drummondii (Beach Evening Primrose)*	Y		
149.	14292	*Oenothera stricta subsp. stricta*	Y		
150.	8149	*Olearia rudis (Rough Daisybush)*			
151.	7348	*Opercularia hispidula (Hispid Stinkweed)*			
152.	12782	*Ophioglossum gramineum*			
153.	1372	*Ornithogalum arabicum (Lesser Cape Lily)*	Y		
154.	7122	*Orobanche minor (Lesser Broomrape)*	Y		
155.	44860	*Pancratium maritimum*	Y		Y
156.	507	*Panicum miliaceum (Millet Panic)*	Y		
157.	34481	*Parthenocissus quinquefolia*	Y		
158.	4343	*Pelargonium capitatum (Rose Pelargonium)*	Y		
159.	4346	*Pelargonium littorale*			
160.	2273	*Persoonia saccata (Snottygobble)*			
161.	20368	*Petrophile axillaris*			
162.	19825	*Petrorhagia dubia*	Y		
163.	47240	*Petunia x atkinsiana*	Y		
164.	11494	*Phalaris arundinacea var. arundinacea*	Y		
165.	4675	*Phyllanthus calycinus (False Boronia)*			
166.	6984	*Physalis philadelphica (Tomatillo)*	Y		Y
167.	18117	*Pimelea rosea subsp. rosea*			
168.	17671	*Pinus halepensis*	Y		
169.	88	*Pinus radiata (Radiata Pine)*	Y		
170.	42281	*Pithocarpa cordata*			
171.	7304	*Plantago major (Greater Plantain)*	Y		
172.	571	*Poa annua (Winter Grass)*	Y		
173.	573	*Poa drummondiana (Knotted Poa)*			
174.	578	*Poa porphyroclados*			
175.	582	*Polypogon monspeliensis (Annual Beardgrass)*	Y		
176.	15426	*Pterostylis aspera*			
177.	12217	*Pterostylis sanguinea*			
178.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
179.	15856	*Ptilotus sericostachyus subsp. sericostachyus*			
180.	32480	*Racopilum cuspidigerum var. convolutaceum*			
181.	2932	*Ranunculus colonorum (Common Buttercup)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
182.	2578	*Rhagodia baccata (Berry Saltbush)*			
183.	11341	*Rhagodia baccata subsp. baccata*			
184.	1556	*Romulea rosea (Guildford Grass)*	Y		
185.	10970	*Rostraria cristata*	Y		
186.	44608	*Rosulabryum billarderii*			
187.	2908	*Sagina maritima*	Y		
188.	48430	*Salicornia quinqueflora*			
189.	6929	*Salvia verbenaca (Wild Sage)*	Y		
190.	6483	*Samolus junceus*			
191.	6484	*Samolus repens (Creeping Brookweed)*			
192.	2356	*Santalum acuminatum (Quandong, Warnga)*			
193.	7368	*Scabiosa atropurpurea (Purple Pincushion)*	Y		
194.	7626	*Scaevola nitida (Shining Fanflower)*			
195.	13152	*Scaevola thesioides subsp. thesioides*			
196.	992	*Schoenus grandiflorus (Large Flowered Bogrush)*			
197.	603	*Secale cereale (Rye)*	Y		
198.	20161	*Senecio pinnatifolius*			
199.	25884	*Senecio pinnatifolius var. latilobus*			
200.	8220	*Senecio vulgaris (Common Groundsel)*	Y		
201.	2909	*Silene gallica (French Catchfly)*	Y		
202.	7025	*Solanum oldfieldii*			
203.	8230	*Sonchus asper (Rough Sowthistle)*	Y		
204.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
205.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
206.	624	*Spinifex hirsutus (Hairy Spinifex)*			
207.	625	*Spinifex longifolius (Beach Spinifex)*			
208.	627	*Spinifex x alterniflorus*			
209.	635	*Sporobolus virginicus (Marine Couch)*			
210.	4828	*Spyridium globulosum (Basket Bush)*			
211.	2918	*Stellaria media (Chickweed)*	Y		
212.	636	*Stenotaphrum secundatum (Buffalo Grass)*	Y		
213.	7694	*Stylidium bulbiferum (Circus Triggerplant)*			
214.	7785	*Stylidium repens (Matted Triggerplant)*			
215.	1260	*Stypandra glauca (Blind Grass)*			
216.	2639	*Suaeda australis (Seablite)*			
217.	32437	*Syntrichia antarctica*			
218.	32438	*Syntrichia pagorum*			
219.	32439	*Syntrichia papillosa*			
220.	4256	*Templetonia retusa (Cockies Tongues)*			
221.	2791	*Tersonia cyathiflora (Button Creeper)*			
222.	2820	*Tetragonia decumbens (Sea Spinach)*	Y		
223.	1036	*Tetraria octandra*			
224.	5077	*Thomasia cognata*			
225.	5105	*Thomasia triphylla*			
226.	2644	*Threlkeldia diffusa (Coast Bonefruit)*			
227.	1319	*Thysanotus arenarius*			
228.	1368	*Trachyandra divaricata*	Y		
229.	6280	*Trachymene pilosa (Native Parsnip)*			
230.	4383	*Tribulus terrestris (Caltrop)*	Y		
231.	32450	*Trichostomum eckelianum*			
232.	4289	*Trifolium angustifolium (Narrowleaf Clover)*	Y		
233.	17145	*Trifolium angustifolium var. angustifolium*	Y		
234.	17763	*Trifolium campestre var. campestre (Hop Clover)*	Y		
235.	4298	*Trifolium hirtum (Rose Clover)*	Y		
236.	14738	*Trifolium resupinatum var. resupinatum*	Y		
237.	4315	*Trifolium tomentosum (Woolly Clover)*	Y		
238.	15509	*Trifolium tomentosum var. tomentosum*	Y		
239.	147	*Triglochin mucronata*			
240.	11665	*Trymalium ledifolium var. ledifolium*			
241.	1767	*Urtica urens (Small Nettle)*	Y		
242.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
243.	7108	*Veronica arvensis (Wall Speedwell)*	Y		
244.	11474	*Vicia sativa subsp. nigra*	Y		
245.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
246.	7384	*Wahlenbergia capensis (Cape Bluebell)*	Y		
247.	6658	*Wilsonia backhousei (Narrow-leaf Wilsonia)*			
248.	6659	*Wilsonia humilis (Silky Wilsonia)*			
249.	8287	*Xanthium spinosum (Bathurst Burr, Common Cockleburr, Spiny Cockleburr, Spiny Clotburr)*	Y		
250.	1256	*Xanthorrhoea preissii (Grass tree, Palga)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
251.	6289	*Xanthosia huegelii*			

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

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

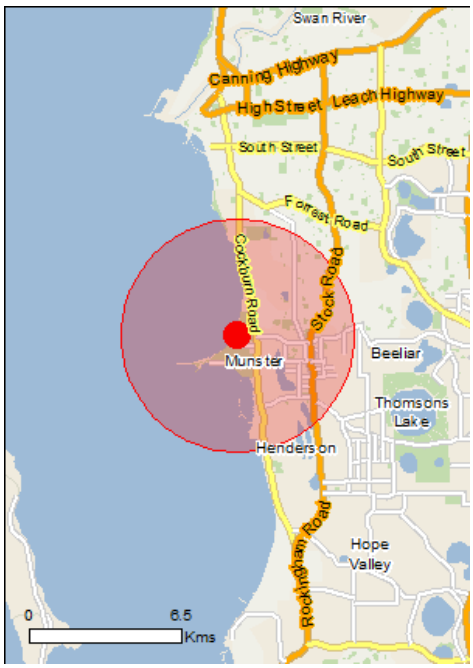
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

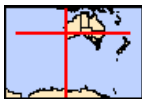
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 02/03/21 13:00:05



Coordinates
Buffer: 5.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	48
Listed Migratory Species:	55

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	84
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	4
Regional Forest Agreements:	None
Invasive Species:	40
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Forrestdale and thomsons lakes	Within 10km of Ramsar

Listed Threatened Ecological Communities [Resource Information]

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

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area

Name	Status	Type of Presence
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Mammals		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area
Plants		
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area
Diuris drummondii Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat may occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area
Drakaea elastica Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known

Name	Status	Type of Presence
		to occur within area
Sharks		
Carcharias taurus (west coast population)		
Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area
Carcharodon carcharias		
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus		
Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes		
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Diomedea amsterdamensis		
Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea dabbenena		
Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
Diomedea epomophora		
Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans		
Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi		
Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Hydroprogne caspia		
Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area
Macronectes giganteus		
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli		
Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Onychoprion anaethetus		
Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area
Sterna dougallii		
Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Breeding known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

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

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

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

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Catharacta skua Great Skua [59472]		Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur

Name	Threatened	Type of Presence within area
Larus pacificus Pacific Gull [811]		Foraging, feeding or related behaviour may occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Puffinus assimilis Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Sterna anaethetus Bridled Tern [814]		Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
Sterna caspia Caspian Tern [59467]		Foraging, feeding or related behaviour known to occur within area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area
Fish		
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
Campichthys galei Gale's Pipefish [66191]		Species or species habitat may occur within area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus subelongatus West Australian Seahorse [66722]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Lissocampus fatiloquus Prophet's Pipefish [66250]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys meraculus Western Crested Pipefish [66259]		Species or species habitat may occur within area
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammals		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known

Name	Threatened	Type of Presence
		to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Whales and other Cetaceans [Resource Information]

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

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Unnamed WA39584	WA
Unnamed WA39752	WA
Unnamed WA42469	WA
Unnamed WA49220	WA

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-32.12543 115.76039

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.

Department of Agriculture Water and the Environment
GPO Box 858
Canberra City ACT 2601 Australia
+61 2 6274 1111

Appendix C
Likelihood Table

Appendix C: Assessment of the Likelihood of Occurrence of Threatened and Priority Flora as per Desktop Assessment Database Searches Surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2021 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 10 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 10 km from the Survey Area, Unknown = Insufficient information available to classify. CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing.

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Preferred Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Caladenia huegelii	T	EN		X	X	6.9	Sep - Oct	Grows in well-drained, deep sandy soils in low mixed woodlands.[1]	No	Low	Low
Diuris drummondii	T	VU		X	X	5.9	Nov - Dec or Jan	Found in low-lying depressions in peaty and sandy clay swamps.[2]	No	Low	Low
Diuris micrantha	T	VU		X	X	10.7	Sep - Oct	Found on dark, grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps.[2]	No	Low	Low
Diuris purdiei	T	EN		X	X	14.8	Sep - Oct	Typically found on sand to sandy clay soils, in areas subject to winter inundation, and amongst native sedges and dense heath.[1]	No	Low	Low
Drakaea elastica	T	EN		X	X	11.9	Oct - Nov	White, grey sand, low-lying situations adjoining winter-wet swamps.[1]	No	Low	Low
Drakaea micrantha	T	VU		X	X	13.3	Sep - Oct	Usually found on cleared firebreaks or open sandy patches that have been disturbed, where competition from other plants has been removed.[1]	No	Low	Low
Grevillea thelemanniana	T	CR			X	11.1	May - Nov	Sand, sandy clay. Winter-wet low-lying flats.[2]	No	Low	Low

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Preferred Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	T	CR			X	14.7	Oct	Occurs on grey, clayey sand with lateritic pebbles in low woodland areas near winter-wetflats.[1]	No	Low	Low
Acacia lasiocarpa var. bracteolata long peduncle variant (G.J. Keighery 5026)	P1				X	6.8	May - Aug	Grey or black sand over clay. Swampy areas, winter wet lowlands.[2]	No	Low	Low
Hydrocotyle striata	P1				X	12.6	Oct	Clay. Springs.[2]	No	Low	Low
Lachnagrostis nesomytica subsp. *paralia*	P1				X	10.4	N/A	Calcareous sands. Coastal dunes and swales.[2]	Yes	Low	Low
Levenhookia preissii	P1				X	13.1	Sep - Dec or Jan	Grey or black peaty sand. Swamps. [2]	No	Low	Low
Bossiaea modesta	P2				X	10.5	Oct - Dec	Soils derived from granite. Damp areas close to stream.[2]	No	Low	Low
Thelymitra variegata	P2				X	7	Jun - Sep	Sandy clay, sand, laterite.[2]	No	Low	Low
Angianthus micropodioides	P3				X	10.4	Nov - Dec or Jan - Feb	Saline sandy soils. River edges, saline depressions, claypans.[2]	No	Low	Low
Cyathochaeta teretifolia	P3				X	10.2	Dec	Grey sand, sandy clay, swamps, creek edges.[2]	No	Low	Low
Austrostipa mundula	P3				X	6.7	Sep - Oct	Upper slope of dune. Pale grey sand over limestone.[2]	Yes	Medium	Medium
Beyeria cinerea subsp. cinerea	P3				X	11.9	May - Aug	Grey sand over limestone.[2]	Yes	Low	Low
Dampiera triloba	P3				X	18.5	Aug - Dec	Dark brown/black peaty soils, dark grey soils, hillsides, coastal plains.[2]	No	Low	Low

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Preferred Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Hibbertia leptotheca	P3				X	8.2	Aug - Oct	Light brown/yellow to white sand, grey humic sand, Tamala limestone, sand dune, limsetone outcrop. [2]	No	Low	Low
Jacksonia gracillima	P3				X	8.4	Oct - Nov	Coastal plains, dry grey sand, near seasonal wetlands and winter-wet areas.[2]	No	Low	Low
Phlebocarya pilosissima subsp. *pilosissima*	P3				X	8.6	Aug - Oct	White or grey sand, lateritic gravel.[2]	Yes	Medium	Medium
Pimelea calcicola	P3				X	4.7	Sep - Nov	Sand, coastal limestone ridges.[2]	Yes	High	High
Stylidium maritimum	P3				X	9.6	Sep - Nov	Sand over limestone. Dune slopes and flats. Coastal heath and shrubland, open Banksia woodland.[2]	Yes	Medium	Medium
Stylidium paludicola	P3				X	8.3	Oct - Dec	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.[2]	No	Low	Low
Styphelia filifolia	P3				X	9.1	Mar - May	Yellow sand, brown sand, grey sand, flat sandplains, lower slopes.[2]	No	Low	Low
Dodonaea hackettiana	P4		X		X	0.8	Jul - Oct	Sand. Outcropping limestone.[2]	Yes	High	Low
Grevillea olivacea	P4		X		X	1.2	Jun - Oct	White or grey sand. Coastal dunes, limestone rocks.[2]	Yes	High	Recorded
Jacksonia sericea	P4				X	6.6	Dec or Jan - Feb	Calcareous and sandy soils.[2]	Yes	Medium	Low
Tripterococcus sp. Brachylobus (A.S. George 14234)	P4				X	12	Feb	Winter wet flats, peaty sand over clay.[2]	No	Low	Low

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Preferred Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Verticordia lindleyi subsp. *lindleyi*	P4				X	13.1	May or Nov - Dec or Jan	Sand, sandy clay. Winter-wet depressions.[2]	No	Low	Low
Calothamnus graniticus subsp. *leptophyllus*	P4				X	14.2	Jun - Aug	Clay over granite, lateritic soils. Hillsides.[2]	No	Low	Low
Hydrocotyle lemnoides	P4				X	12.5	Aug - Oct	Swamps.[2]	No	Low	Low
Kennedia beckxiana	P4				X	11.8	Sep - Dec	Sand, loam, granite hills and outcrops.[2]	No	Low	Low
Lepidium puberulum	P4				X	10	Jul - Aug or Oct - Nov	Sandy soils.[2]	Yes	Low	Low
Microtis quadrata	P4				X	7	Oct - Dec	Sandy clay loam, swamps, flats.[2]	No	Low	Low
Myosotis australis	P4				X	11.8	Aug - Nov	Grey sand over limestone.[2]	Yes	Low	Low
Stylidium longitubum	P4				X	6.9	Oct - Dec	Sandy clay, clay. Seasonal wetlands.[2]	No	Low	Low

[1] Department of Agriculture, Water and the Environment (2020). SPRAT EPBC Threatened Flora in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed 2020-04-06T11:52:35.

[2] Department of the Environment (2020). SPRAT EPBC Threatened Flora in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed 2020-04-06T11:52:35.

Appendix D
Flora Species List

Appendix: Flora Species List

Family	Scientific Name	Status
Aizoaceae	**Carpobrotus edulis*	
	**Tetragonia decumbens*	
Asparagaceae	*Acanthocarpus preissii*	
	**Asparagus asparagoides*	
Asphodelaceae	**Trachyandra divaricata*	
Asteraceae	*Olearia axillaris*	
	Senecio condylus	
Caprifoliaceae	**Centranthus macrosiphon*	
Chenopodiaceae	*Rhagodia baccata*	
	Threlkeldia diffusa	
Crassulaceae	**Crassula glomerata*	
Cupressaceae	*Callitris preissii*	
Cyperaceae	*Ficinia nodosa*	
	Isolepis marginata	
	Lepidosperma gladiatum	
Euphorbiaceae	**Euphorbia paralias*	
	**Euphorbia peplus*	
	**Euphorbia terracina*	
Fabaceae	*Acacia cochlearis*	
	Acacia cyclops	
	Acacia lasiocarpa	
	Acacia rostellifera	
Geraniaceae	**Pelargonium capitatum*	
Goodeniaceae	*Scaevola crassifolia*	
Lauraceae	*Cassytha* sp.	
Myrtaceae	*Agonis flexuosa*	
	Melaleuca lanceolata	
	Melaleuca systena	
Onagraceae	**Oenothera drummondii*	
Papaveraceae	**Fumaria muralis*	
Poaceae	**Ammophila arenaria*	
	**Avena barbata*	
	**Bromus diandrus*	
	**Ehrharta longiflora*	
	**Lagurus ovatus*	
	Spinifex longifolius	
Primulaceae	**Lysimachia arvensis*	
Proteaceae	*Grevillea olivacea*	P4
	Grevillea preissii	
Rhamnaceae	*Spyridium globulosum*	

Appendix E
Flora Site Sheets

FLORA SITE SHEET

Project Name Woodman Point Ammo Jetty
Site: WPR01
Location MGA 50 383117 **mE** 6444877 **mN**

Described by: Narelle Whittington
Date: 04/03/2021
Type: Releve

Landform: Dune swale
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey, White

Vegetation: *Callitris preissii tall sparse shrubland over Acacia rostellifera low open shrubland over *Bromus diandrus and *Avena barbata low to mid tussock grassland over *Trachycandra divaricata, *Euphorbia terracina and Acanthocarpus preissii low to mid sparse herbland*
Condition: Degraded **Disturbance Type:** Weeds, Litter
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia rostellifera	80	20	
Acanthocarpus preissii	60	1	
**Asparagus asparagoides*	90	0.5	
**Avena barbata*	65	15	
**Bromus diandrus*	40	30	
Callitris preissii	500	3	Some are planted seedlings with guards
**Euphorbia terracina*	35	2	
**Trachyandra divaricata*	25	5	

FLORA SITE SHEET

Project Name Woodman Point Ammo Jetty
Site: WPR02
Location MGA 50 382987 **mE** 6444864 **mN**

Described by: Narelle Whittington
Date: 04/03/2021
Type: Releve

Landform: Dune swale
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey, White

Vegetation: *Acacia rostellifera mid sparse shrubland over Scaevola crassifolia low sparse shrubland over Spinifex longifolius low sparse tussock grassland over Lepidosperma gladiatum tall sedgeland over *Euphorbia terracina, *Trachyandra divaricata and *Pelargonium capitatum low sparse herbland*
Condition: Very Good **Disturbance Type:** Weeds, Litter
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia rostellifera	160	5	
**Euphorbia terracina*	40	2	
Lepidosperma gladiatum	110	60	
**Oenothera drummondii*	25	0.5	
**Pelargonium capitatum*	40	1	
Scaevola crassifolia	45	5	
Spinifex longifolius	45	5	
**Trachyandra divaricata*	30	2	

FLORA SITE SHEET

Project Name Woodman Point Ammo Jetty
Site: WPR03
Location MGA 50 382929 **mE** 6444913 **mN**

Described by: Narelle Whittington
Date: 04/03/2021
Type: Releve

Landform: Dune crest
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey, White

Vegetation: *Olearia axillaris, Scaevola crassifolia and Acacia rostellifera low sparse shrubland over Spinifex longifolius and *Ammophila arenaria mid to tall open tussock grassland over *Euphorbia paralias, *Trachyandra divaricata and *Oenothera drummondii low open herbland*
Condition: Degraded **Disturbance Type:** Weeds
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia rostellifera	80	2	
**Ammophila arenaria*	120	2	
**Carpobrotus edulis*	15	2	
**Euphorbia paralias*	40	4	
Ficinia nodosa	40	1	
**Oenothera drummondii*	25	3	
Olearia axillaris	80	4	
Scaevola crassifolia	30	3	
Spinifex longifolius	70	18	
**Tetragonia decumbens*	40	1	
**Trachyandra divaricata*	25	4	

FLORA SITE SHEET

Project Name Woodman Point Ammo Jetty
Site: WPR04
Location MGA 50 382992 **mE** 6445036 **mN**

Described by: Narelle Whittington
Date: 04/03/2021
Type: Releve

Landform: Dune slope
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey, White

Vegetation: *Acacia rostellifera, Olearia axillaris and Rhagodia baccata mid open shrubland over Scaevola crassifolia and Acanthocarpus preissii low open shrubland over Spinifex longifolius mid open tussock grassland over *Trachyandra divaricata, *Carpobrotus edulis and *Pelargonium capitatum low sparse herbland*

Condition: Good **Disturbance Type:** Weeds, Litter
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia rostellifera	200	6	
Acanthocarpus preissii	45	3	
**Carpobrotus edulis*	15	2	
**Oenothera drummondii*	35	1	
Olearia axillaris	130	6	
**Pelargonium capitatum*	35	2	
Rhagodia baccata	120	2	
Scaevola crassifolia	90	8	
Spinifex longifolius	70	20	
**Trachyandra divaricata*	30	4	

FLORA SITE SHEET

Project Name Woodman Point Ammo Jetty
Site: WPR05
Location MGA 50 383049 **mE** 6445064 **mN**

Described by: Narelle Whittington
Date: 23/09/2021
Type: Releve

Landform: Dune slope
Slope: Gentle
Rock Type: Limestone
Soil Type: Sand
Soil Colour: White

Vegetation: *Acacia rostellifera mid open shrubland over Acacia cochlearis, Grevillea preissii and Rhagodia baccata low open shrubland over *Bromus diandrus low open tussock grassland over *Trachyandra divaricata, *Euphorbia terracina and *Crassula glomerata low open herbland*
Condition: Good **Disturbance Type:** Weeds,Litter,Rabbit tracks/scats
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia cochlearis	100	10	
Acacia rostellifera	160	30	
**Bromus diandrus*	40	15	
**Crassula glomerata*	4	2	
**Euphorbia peplus*	5	2	
**Euphorbia terracina*	45	3	
**Fumaria muralis*	35	1	
Grevillea preissii	45	2	
**Lysimachia arvensis*	5	0.5	
Rhagodia baccata	90	2	
Senecio condylus	30	1	
**Trachyandra divaricata*	40	4	

FLORA SITE SHEET

Project Name Woodman Point Ammo Jetty
Site: WPR06
Location MGA 50 383088 **mE** 6445123 **mN**

Described by: Narelle Whittington
Date: 23/09/2021
Type: Releve

Landform: Dune crest
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: White

Vegetation: *Melaleuca lanceolata and Agonis flexuosa tall shrubland over Acacia rostellifera and Grevillea olivacea mid open shrubland over Rhagodia baccata low sparse shrubland over *Ehrharta longiflora low sparse tussock grassland over *Trachyandra divaricata, *Crassula glomerata and Cassytha sp. low sparse herbland*

Condition: Good **Disturbance Type:** Weeds,Litter
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia rostellifera	170	10	
Agonis flexuosa	250	1	
Cassytha sp.	300	1	
**Crassula glomerata*	3	1	
**Ehrharta longiflora*	35	10	
Grevillea olivacea	120	3	P4
**Lysimachia arvensis*	4	0.5	
Melaleuca lanceolata	400	40	
Rhagodia baccata	80	2	
Senecio condylus	15	0.5	
**Trachyandra divaricata*	35	5	

360 environmental | Part of SLR

10 Bermondsey Street West Leederville WA 6007 **t** (+618) 9388 8360 **f** (+618) 9381 2360
PO BOX 14, West Perth WA 6872
w 360environmental.com.au **e** admin@360environmental.com.au

people • planet • professional