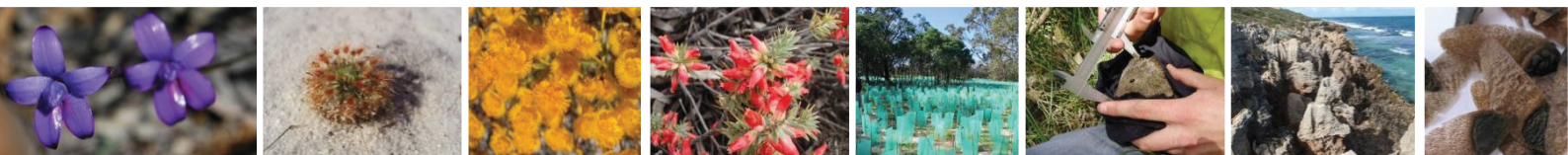




Natural Area
CONSULTING MANAGEMENT SERVICES

Mindarie Regional Council
Infiltration Pond Revegetation Plan
Tamala Park

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



Acknowledgement of Country

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

Disclaimer

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

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

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

System Certifications

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

Document Title	MRC-R-Infiltration Pond Revegetation Plan- Tamala Park				
Location	ConsultingSP/Shared Documents/Mindarie Regional Council/2024 Quotes/2024 06 078 Revegetation Plan/Infiltration Pond Revegetation Plan/Report/MRC- R - Infiltration Pond Revegetation Plan.docx				
Draft/Version No.	Date	Changes	Prepared by	Approved by	Status
D1	July 2024	New Document	KE	LC	Superseded
V1	Aug 2024	Removal of draft watermark		KE	Superseded
V2	Nov 2024	Addressing DWER Comments	KE	JW	Superseded
V3	Dec 2024	Addressing Additional Comments	KE	JW	Superseded
V4	Dec 2024	Removal of Pond Planting areas		KE	Released

Executive Summary

Natural Area Consulting Management Services (Natural Area) was commissioned by Mindarie Regional Council (MRC) to prepare a revegetation plan for a new infiltration pond and surrounding vegetation located within the Tamala Park- Mindarie Regional Council site in the City of Wanneroo.

Activities undertaken by Natural Area included:

- Desktop assessment.
- Basic site assessment survey to determine:
 - vegetation type
 - vegetation condition
 - flora species present (including invasive species)
 - priority/threatened flora species and ecological communities present.
- Revegetation plan outlining:
 - revegetation zones
 - proposed species list and planting densities
 - revegetation methodology
 - monitoring and reporting methodology
 - indicative implementation schedule.

The installation of the infiltration pond requires the removal of 0.7 ha of native vegetation within Bush Forever Site 323. A clearing permit application (CPS 10554/1) was submitted in May 2024. Reports and surveys associated with the installation of the infiltration ponds include the following and are to be read in conjunction with this revegetation plan:

- *Mindarie Regional Council 2016 Bushland Survey Tamala Park* (Natural Area, 2017)
- *Mindarie Regional Council Flora and Fauna Survey Areas - 1 and 2* (Natural Area, 2024a)
- *Mindarie Regional Council Threatened Ecological Community Assessment -Tamala Park* (Natural Area, 2024b).

Contents

1.0	Introduction.....	6
1.1	Location	6
1.2	Scope	6
2.0	Site Characteristics	8
2.1	Regional Context	8
2.2	Climate.....	8
2.3	Topography and Soils	9
2.4	Vegetation Complex	12
2.5	Heritage Values.....	12
3.0	Survey Methodology	14
3.1	Desktop and Literature Review	14
3.2	On-ground Flora Survey.....	14
3.2.1	Vegetation Type.....	15
3.2.2	Vegetation Condition.....	15
3.3	Limitations	15
4.0	Flora Survey Results.....	17
4.1	Desktop Survey	17
4.1.1	Threatened and Priority Ecological Communities	18
4.2	Flora Survey Results.....	19
4.2.1	Vegetation Types	19
4.2.2	Vegetation Condition.....	21
4.2.3	Flora.....	23
4.2.4	Threatened and Priority Communities	25
4.3	Existing Adverse Site Conditions and Threats	25
4.3.1	Erosion and Surface Water Diversion.....	25
4.3.2	Weeds and Plant Pathogens.....	25
4.3.3	Feral Animals	25
4.3.4	Rubbish	25
5.0	Suitability of Reference Site	26
5.1	Species List and Density.....	29
6.0	Completion Criteria	32

6.1	Project Limitations and Potential Issues	34
7.0	Revegetation Methodology.....	35
7.1	Site Preparation.....	35
7.2	Revegetation Techniques	35
7.2.1	Seed Collection	35
7.2.2	Tubestock	35
7.3	Vegetation Establishment	35
7.4	Maintenance and Contingencies.....	36
7.4.1	Weed Control	36
7.4.2	Maintenance.....	39
7.5	Hygiene Management	39
7.5.1	Weed Hygiene	39
7.5.2	Dieback (Phytophthora) Hygiene	39
7.6	Monitoring and Reporting.....	40
8.0	Implementation Schedule	41
9.0	References.....	42
	Appendix 1: PMST Report 10 km.....	45
	Appendix 2: Significant Species	77
	Appendix 3: Conservation Codes.....	96
	Appendix 4: Quadrat Data.....	98
	Appendix 5: Example Monitoring Recording Sheets	106

1.0 Introduction

Natural Area Consulting Management Services (Natural Area) was commissioned by Mindarie Regional Council (MRC) to prepare a revegetation plan for a new infiltration pond and surrounding vegetation located within Tamala Park. The installation of the infiltration pond and surrounding infrastructure requires the removal of 0.7 ha of native vegetation. MRC submitted a clearing permit application (CPS10554/1) in May 2024.

1.1 Location

The revegetation area is within the MRC facility and Bush Forever Site 323 (DPLH, 2019) (Figure 1). The site is located in Tamala Park within the City of Wanneroo, approximately 31 km north of Perth Central Business District (CBD).

1.2 Scope

Activities undertaken by Natural Area included:

- Desktop assessment to determine:
 - potential flora species including declared rare and priority listed flora species (DRF) and ecological communities that may occur across the site.
- Basic site assessment survey to determine:
 - vegetation type
 - vegetation condition
 - flora species present (including invasive species)
 - priority/threatened flora species and ecological communities present.
- Revegetation Plan outlining:
 - revegetation zones
 - proposed species list and planting densities
 - revegetation methodology
 - monitoring and reporting methodology
 - indicative implementation schedule.



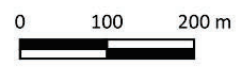
Figure 1:
Site Location

Tamala Park, City of Wanneroo

Legend

- ▭ Bush Forever 323 Site Boundary
- ▭ Infiltration Pond Boundary

Client: Mindarie Regional Council
Date: 17/07/2024
Created by: K.EVANS
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 8700



2.0 Site Characteristics

The characteristics of a site have a strong bearing on the flora, vegetation, fauna, and ecological communities present. The key characteristics of the survey areas are outlined in this section.

2.1 Regional Context

The site is located within the Swan Coastal Plain 4 (SWA02) IBRA subregion (Department Climate Change, Energy, the Environment and Water (DCCEEW), 2024). This region is low-lying coastal plain characterised by soils comprised of sands of colluvial and aeolian origin, as well as alluvial river flats and coastal limestone. It is dominated by *Banksia* or Tuart vegetation types, as well as some areas of *Casuarina obesa*, *Melaleuca* sp. or Jarrah Woodlands (Mitchell *et al.* 2002).

2.2 Climate

The climate experienced in the area is Mediterranean, with dry, hot summers and cool, wet winters.

According to the Bureau of Meteorology (BoM, 2024); Gingin Aero, site number 009178, the region has an average:

- Rainfall of 629.0 mm pa, with rain falling predominantly between June and August
- Maximum temperature range from 18.4 °C in winter to 33.3 °C in summer with a maximum recorded temperature of 46.3 °C.
- Minimum temperatures range from 6.5 °C in winter to 17.1 °C in summer with a minimum recorded temperature of -3.7 °C.

Predominant wind directions include morning easterlies and westerly sea breezes during the summer months, with an average wind speed of 12.4 km/h and gusts of more than 100 km/h.

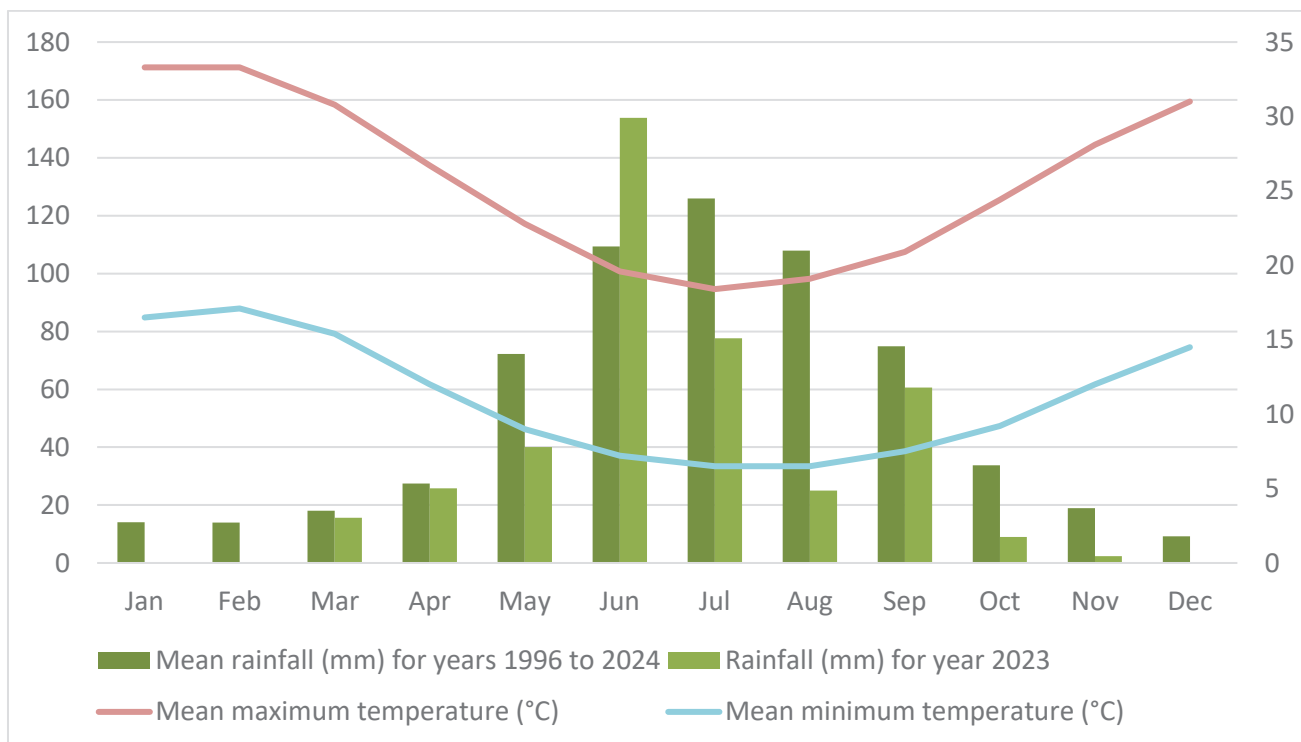


Figure 2: Average maximum and minimum temperature and rainfall from 1996-2024 and 2023 rainfall at Gingin Aero (Station ID 009178) (BoM, 2024)

2.3 Topography and Soils

Two soil types were identified within the infiltration pond revegetation site, being Karrakatta Sand Yellow Phase and Quindalup South deep sand flat Phase (Department of Primary Industries and Regional Development (DPIRD), 2022). The site ranges from 32 m Australian Height Datum (AHD) in the northeast and rises to 34 m AHD in the south (DPIRD, 2019) (Table 1 and Figure 3). The topography of the revegetation site will be changed due to the construction of the infiltration pond and changes to the surrounding environment. Elevation levels of the revegetation site are planned to be adapted to 32.5 m AHD at the top of the infiltration pond bank and 29.1 m AHD at the base of the pond the slope will be at a -1:3.0 slope (Figure 4).

Table 1: Soil types within Bush Forever Site 323 (DPIRD, 2022)

Symbol	Name	Description	Area
211Sp_Ky	Karrakatta Sand Yellow Phase	Low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. <i>Banksia</i> spp. woodland with scattered emergent <i>Eucalyptus</i> , <i>gomphocephala</i> , and <i>E. marginata</i> and a dense shrub layer.	5,710 m ²
211Qu_Qp	Quindalup South deep sand flat Phase	Undulating landscapes with deep calcareous sands overlying limestone. Soils have dark grey-brown sand to about 50 cm and then pale brown sand. Remnants of hummocks are often present.	716 m ²

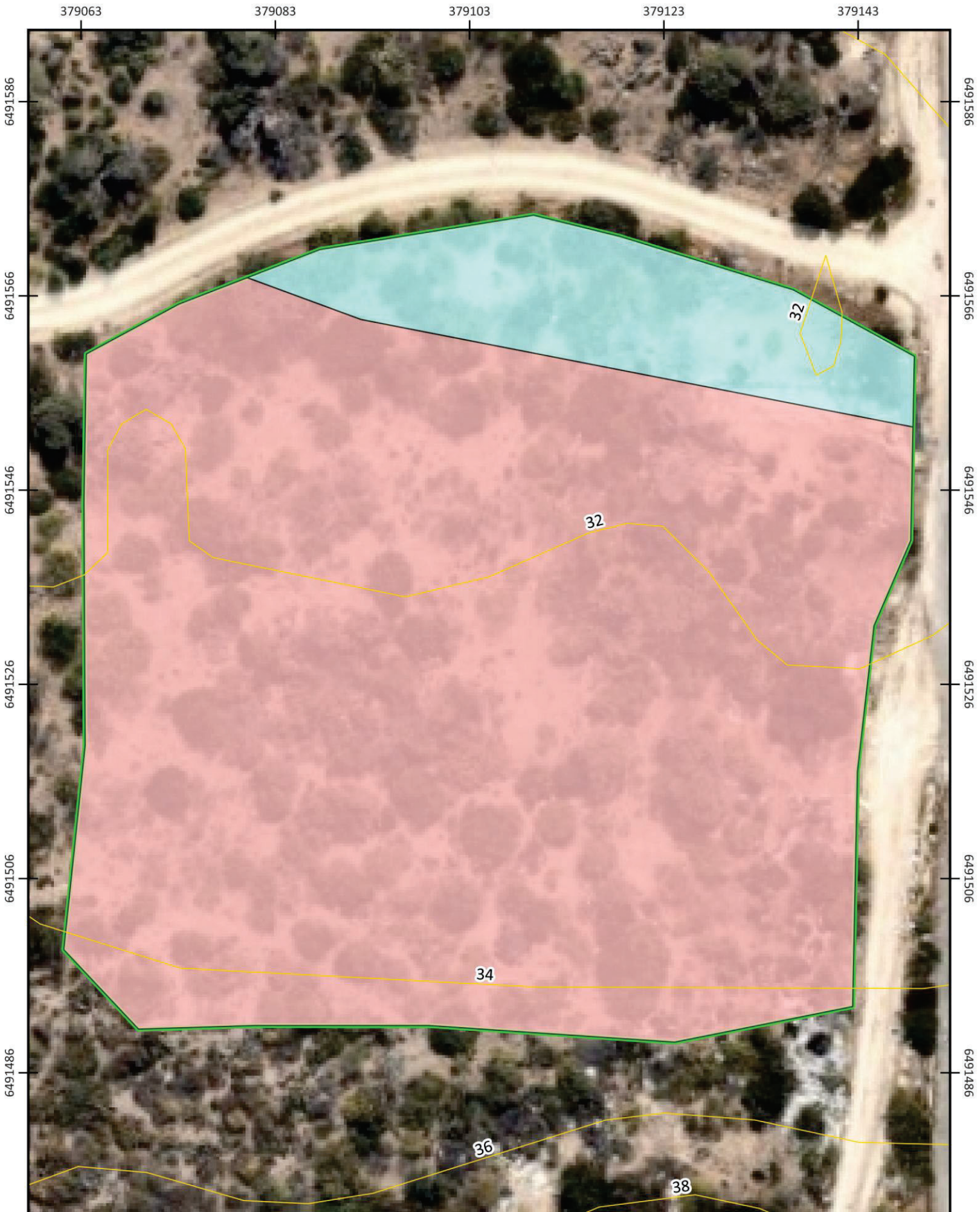






Figure 3:
Topography and Soils

Tamala Park, City of Wanneroo

Legend

-  Infiltration Pond Boundary
-  Contours 2 m
- Soil Type**
-  211Qu_Qp
-  211Sp_Ky

Client: Mindarie Regional Council
Date: 17/07/2024
Created by: K.Evans
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 500





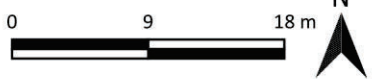
Figure 4:
 Topography of Infiltration
 Pond Following Construction

Tamala Park, City of Wanneroo

Legend

-  Infiltration Pond Boundary
-  0.5 m Contours
-  2 m Contours

Client: Mindarie Regional Council
Date: 25/07/2024
Created by: K.Evans
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 500



2.4 Vegetation Complex

One vegetation complex exists throughout the infiltration pond revegetation area. Quindalup Complex is described by Heddle, Loneragan, and Havel (1980) as being restricted to the coastal dunes and can be divided into separate sections. The Quindalup Complex foredune contains species such as *Atriplex isatidea*, **Cakile maritima*, *Leucophyta brownii*, *Carpobrotus virescens*, **Pelargonium capitatum*, and *Spinifex longifolius*. The Quindalup Complex mobile and stable dune contains *Acacia cyclops*, *Lepidosperma gladiatum*, *Myoporum insulare*, *Olearia axillaris*, *Scaevola crassifolia* and *Spyridium globulosum* (Heddle et al., 1980).

The pre-European extent of this vegetation complex remaining is:

- 60.49 % within the Swan Coastal Plain
- 60.70% within the City of Wanneroo (Government of Western Australia, 2019).

2.5 Heritage Values

There are several heritage areas located within the MRC site boundary these have been outlined in Table 2 (Figure 5). One aboriginal heritage site (ID 3567) is located within the infiltration pond revegetation site and is highlighted in Table 2.

Table 2: Heritage sites located within site boundaries (DPLH, 2024a; DPLH, 2024b)



ID	Name	Place type
3407	Tamala Park Trees	Modified Tree
3567	Mindarie Waugal	Artefacts/Scatter; Creation/Dreaming Narrative
17497	Mindarie Burial Mound	Burial
18801	Scarred Tree	Modified Tree
18802	Tamala Park Campsite	Camp; Creation/ Dreaming Narrative
18803	Tamala Park Waterhole	Creation/Dreaming Narrative



Figure 5:
Heritage Site

Tamala Park, City of Wanneroo

Legend

-  Infiltration Ponds Boundary
-  Aboriginal Cultural Heritage Register

Client: Mindarie Regional Council
Date: 17/07/2024
Created by: K.Evans
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 500



3.0 Survey Methodology

3.1 Desktop and Literature Review

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

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

The following databases were accessed to obtain relevant information:

- NatureMap (DBCA, 2023a)
- Protected Matters Search Tool (Department of Climate Change, Energy, the Environment and Water (DCCEEW)), 2023) (Appendix 1)
- FloraBase (WA Herbarium, 1998)
- Threatened and priority flora/fauna/ecological community database searches (DBCA, 2023b; 2023c; 2023d).
- *Mindarie Regional Council Flora and Fauna Survey Areas - 1 and 2* (Natural Area, 2024a)
- *Mindarie Regional Council TEC Assessment -Tamala Park* (Natural Area, 2024b).

Conservation code definitions for the State and Commonwealth are provided in Appendix 2.

3.2 On-ground Flora Survey

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

Natural Area environmental scientists undertook the survey on 30 November 2023, 1 December 2023 and 15 January 2024 with an additional threatened ecological community assessment conducted on 5 July 2024, with key data recorded using QField software on a handheld tablet. Survey activities included:

- traversing the entirety of the site and recording all species present, including native and invasive species
- marking locations of any conservation significant flora, Declared Pests (DP) and/or Weeds of National Significance (WoNS) identified
- recording vegetation type including dominant over, middle and understorey species to describe vegetation type in line with the National Vegetation Information System (NVIS) Level V- Association (Executive Steering Committee for Australian Vegetation Information (ESCAVI) 2003)
- recording vegetation condition using the scale attributed to Keighery (Table 3) (Government of Western Australia, 2000)
- the use of GPS to map significant species and boundaries of differing vegetation type and condition
- recording evidence of disturbance, such as fire.

3.2.1 Vegetation Type

Vegetation type is described using the structural classes outlined in the Australian Vegetation Attribute Manual (ESCAVI, 2003). Vegetation type is described to Level V (Association). This includes the dominant growth form, height, cover and three dominant species for each strata (ESCAVI, 2003).

3.2.2 Vegetation Condition

Vegetation condition was assessed using the rating scale attributed to Keighery in *Technical Guidance-Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016). Table 3 provides a description of the rating scale.

Table 3: Vegetation condition ratings

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

Source: EPA, 2016

3.3 Limitations

Limitations associated with the site assessment survey are outlined in Table 4. Limitations from the initial flora survey can be found in *Mindarie Regional Council Flora and Fauna Survey – Sreas 1 and 2* (Natural Area, 2024a).

Table 4: Site assessment survey limitations

Potential Limitation	Degree of Limitation	Comments
Availability of contextual information	None	Government data on regional and local contextual information are readily available for the survey area.

Potential Limitation	Degree of Limitation	Comments
Competency/experience of team	None	Survey activities were undertaken by experienced environmental scientists who have extensive experience undertaking flora surveys and site assessments within the Swan Coastal Plain bioregion.
Survey effort and extent	None	A site assessment was undertaken over three days. The survey areas were traversed and flora species, vegetation condition and vegetation types within the survey areas were adequately assessed.
Access restrictions	None	Environmental scientists were able to traverse throughout the survey area with no access restrictions present.

4.0 Flora Survey Results

4.1 Desktop Survey

A desktop survey of online databases indicated the potential for a total of 39 conservation significant species to occur within 10 km of the survey area (Table 5). NatureMap indicated 27 conservation significant flora species listed under the *Biodiversity Conservation Act 2016* (WA) (*BC Act 2016*) or by the Western Australian Herbarium (1998-), as potentially occurring within a 10 km radius of the site (DBCA, 2023a). A review of the Protected Matters Search Tool (PMST) (DCCEEW, 2023) indicated 14 significant flora species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (*EPBC Act 1999*) as potentially occurring within a 10 km radius of the site (Appendix 2).

A review of the DBCA (2023b) threatened and priority flora database indicated 28 threatened or priority species have been recorded within 10 km of the site. Of the conservation significant species potentially found in the area, it was determined that the site conditions (soil type, drainage, location) may be suitable for 12 (highlighted green) of these species (Table 5). Conservation code descriptions are provided in Appendix 3.

Table 5: Threatened and Priority flora species listed by NatureMap, PMST and DBCA

Species Name	Cons Code	NatureMap	PMST	DBCA
<i>Acacia benthamii</i>	P2	X		X
<i>Andersonia gracilis</i>	EN		X	
<i>Anigozanthos viridis</i> subsp. <i>terraspectans</i>	VU		X	
<i>Austrostipa mundula</i>	P3	X		X
<i>Baeckea</i> sp. Limestone	P1	X		X
<i>Banksia mimica</i>	EN		X	
<i>Caladenia huegelii</i>	EN		X	
<i>Calectasia elegans</i>	P2			X
<i>Conostylis bracteata</i>	P3	X		X
<i>Cyathochaeta teretifolia</i>	P3	X		X
<i>Diuris micrantha</i>	VU		X	
<i>Diuris purdiei</i>	EN		X	
<i>Drakaea elastica</i>	EN		X	
<i>Drakaea micrantha</i>	VU		X	
<i>Drosera x sidjamesii</i>	P1	X		X
<i>Eleocharis keigheryi</i>	VU		X	
<i>Eucalyptus argutifolia</i>	VU	X	X	X
<i>Eucalyptus foecunda</i> subsp. <i>foecunda</i>	P4	X		X

Species Name	Cons Code	NatureMap	PMST	DBCA
<i>Fabronia hampeana</i>	P2	X		X
<i>Grevillea</i> sp. Ocean Reef	P1	X		X
<i>Hibbertia leptotheca</i>	P3	X		X
<i>Jacksonia gracillima</i>	P3	X		X
<i>Jacksonia sericea</i>	P4	X		X
<i>Lecania turicensis</i> var. <i>turicensis</i>	P2	X		X
<i>Leucopogon maritimus</i>	P1	X		X
<i>Leucopogon</i> sp. Yanchep	P3	X		X
<i>Macarthuria keigheryi</i>	EN		X	
<i>Marianthus paralius</i>	EN	X	X	X
<i>Melaleuca</i> sp. Wanneroo	EN	X	X	X
<i>Netrostylis</i> sp. Chandala	P2	X		X
<i>Paracaleana dixonii</i>	EN		X	
<i>Pimelea calcicola</i>	P3	X		X
<i>Poranthera moorokatta</i>	P2	X		X
<i>Sarcozona bicarinata</i>	P3	X		X
<i>Stylidium maritimum</i>	P3	X		X
<i>Stylidium paludicola</i>	P3	X		X
<i>Styphelia filifolia</i>	P3	X		X
<i>Thelymitra variegata</i>	P2	X		X
<i>Utricularia oppositiflora</i>	P3	X		X

4.1.1 Threatened and Priority Ecological Communities

A review of the PMST report identified three listed Threatened Ecological Communities that could potentially occur within 10 km of the site (Table 6).

Table 6: Potential Threatened Ecological Communities within the survey area



Name	Status	Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within the area
Empodisma peatlands of southwestern Australia	Endangered	Community may occur within the area
Tuart (<i>Eucalyptus gomphocephala</i>) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to occur within the area

4.2 Flora Survey Results

4.2.1 Vegetation Types

Two vegetation types were recorded within the infiltration pond site boundary. Vegetation types are described in Table 7 and shown in Figure 6.

Table 7: Vegetation type within the survey area

Vegetation Type	Vegetation Symbol	Description	Photograph
<i>Banksia menziesii</i> Open Forest	BmOF	<i>Banksia menziesii</i> open forest over <i>Xanthorrhoea preissii</i> and mixed shrubs, and understorey of <i>Mesomelaena pseudostygia</i>	
<i>Spyridium globulosum</i> Shrubland	SgS	<i>Spyridium globulosum</i> and <i>Melaleuca systema</i> and mixed coastal shrubs over an understorey of <i>Lomandra maritima</i> and <i>Desmocladus flexuosus</i>	

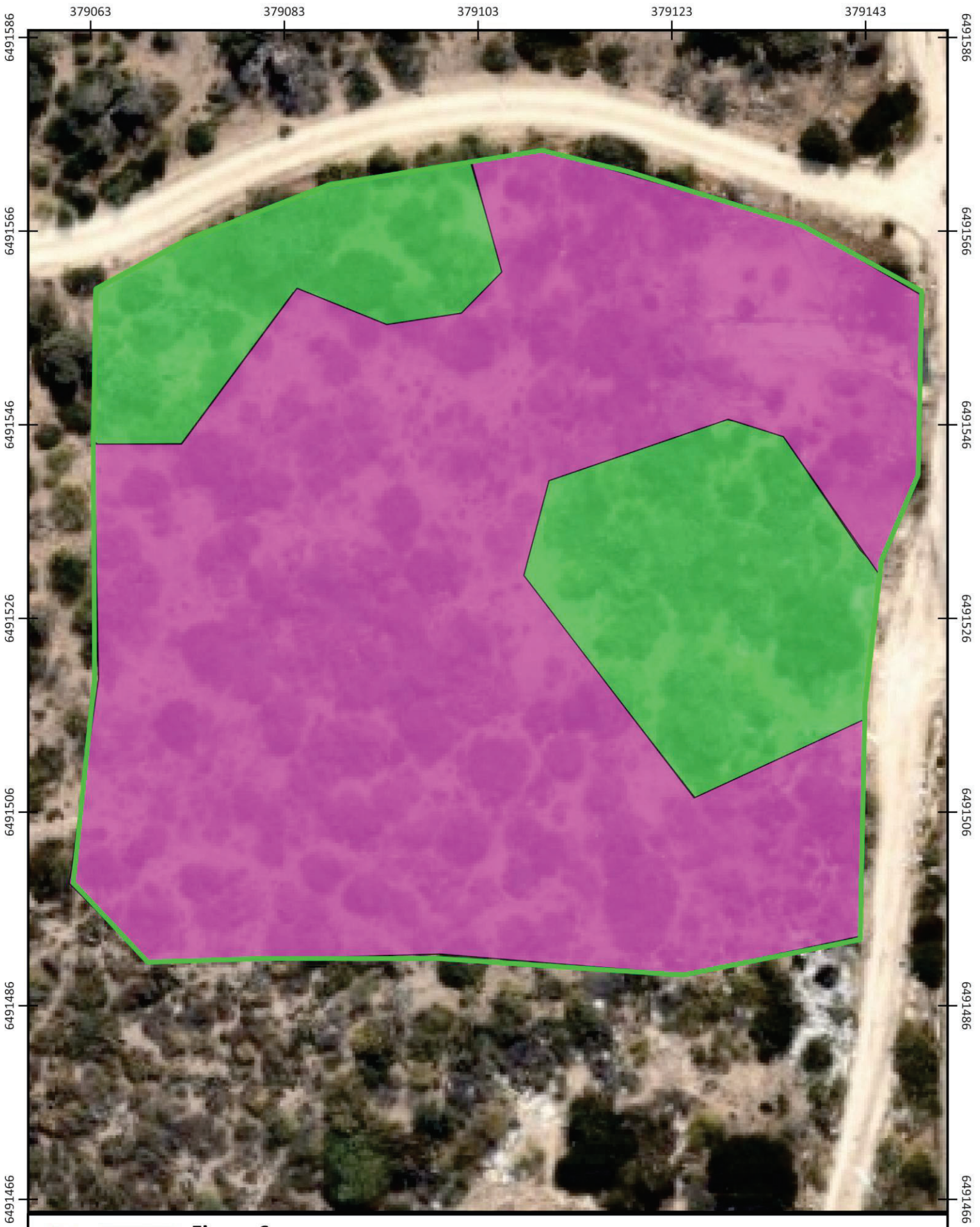





Figure 6:
Vegetation Types

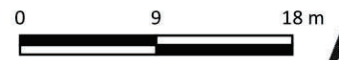


Tamala Park, City of Wanneroo

Legend

-  Infiltration Pond Boundary
- Vegetation Type**
-  BmOF
-  SgS

Client: Mindarie Regional Council
Date: 17/07/2024
Created by: K.EVANS
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 500



4.2.2 Vegetation Condition

Vegetation condition on site ranged from completely degraded to excellent (Table 8, Figure 7).

Table 8: Vegetation condition within Bush Forever Site 323.

Vegetation Condition	Pristine	Excellent	Very Good	Good	Degraded	Completely Degraded	Total
Area (ha)	0	0	0	0	0.599	0.043	0.642
Area (%)	0	0	0	0	93.3	6.7	100

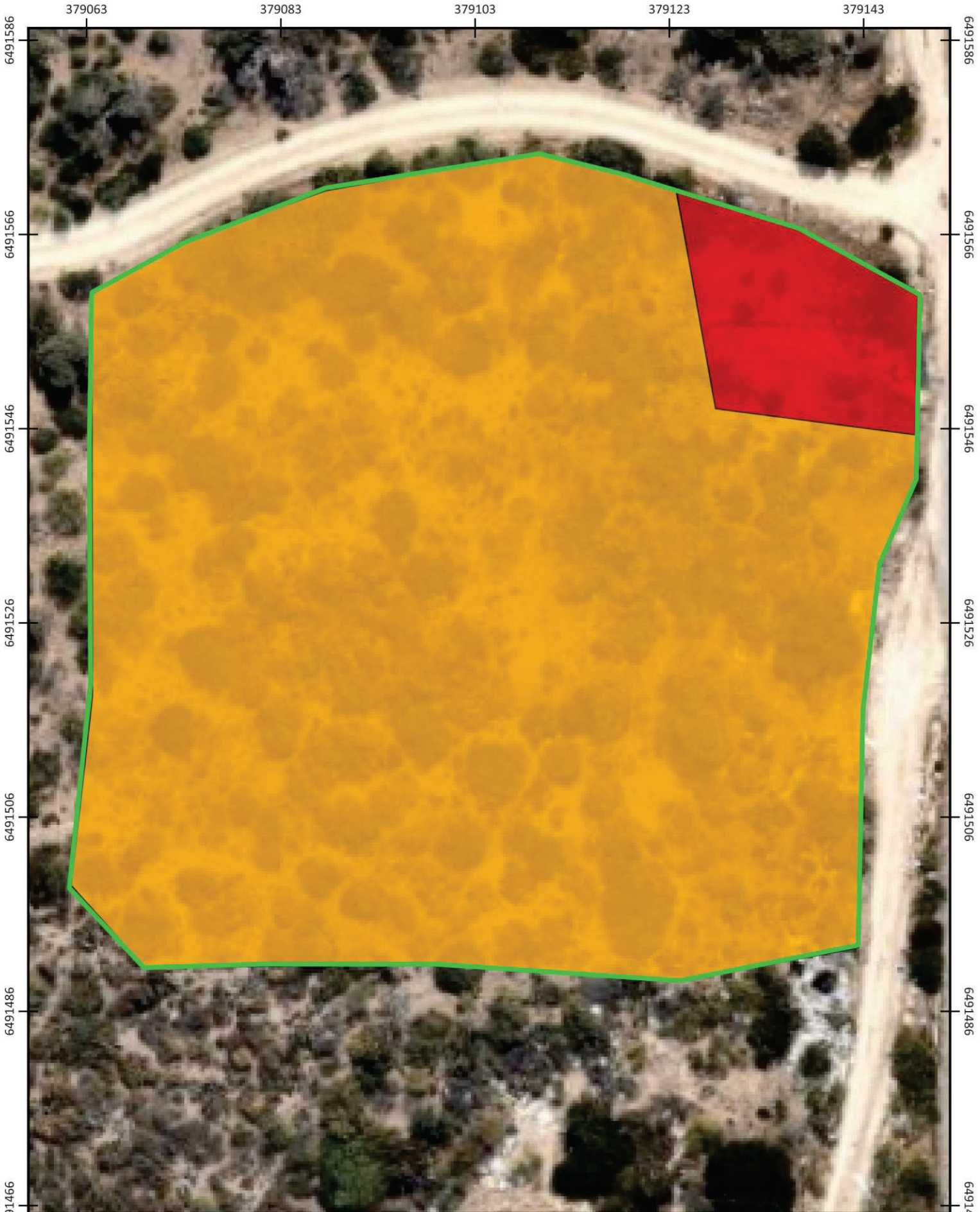





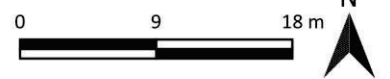
Figure 7:
Vegetation Condition

Tamala Park, City of Wanneroo

Legend

-  Infiltration Pond Boundary
- Vegetation Condition
-  Completely Degraded
-  Degraded

Client: Mindarie Regional Council
Date: 19/07/2024
Created by: K.Evans
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 500



4.2.3 Flora

As per the *Mindarie Regional Council Flora and Fauna Survey – Areas 1 and 2* (Natural Area, 2024a) and *Mindarie Regional Council Threatened Ecological Community Assessment – Tamala Park* (Natural Area 2024b). A total of 65 flora species (taxa) were recorded from 32 families during the field survey, comprising of 36 introduced (weeds) and 29 native species. Examples of native flora species are shown in Figure 8 and weed species in Figure 9. A native species list is located in Table 9 and an introduced species list is located in Section 7.4.1. One declared pest Bridal Creeper (**Asparagus asparagoides*) was identified and is also considered a weed of national significance (WoNS). Declared pests are listed on the Western Australian Organism List (WAOL) under the *Biodiversity and Agriculture Management Act 2007* (WA). This requires the landowner/land manager to control the population to limit damage resulting from the presence of these species (DPIRD, 2024).

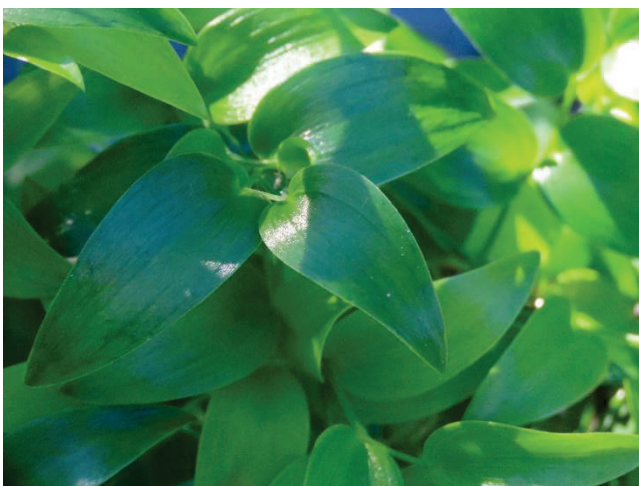


Spyridium globulosum (Basket Bush)



Banksia prionotes (Acorn Banksia)

Figure 8: Examples of native flora species recorded



Bridal Creeper (**Asparagus asparagoides*) (DP & WoNS)



Hottentot Fig (**Carpobrotus edulis*)

Figure 9: Examples of introduced flora species recorded

Table 9: Combined species list from 2023 and 2024 flora surveys (Natural Area, 2024a; Natural Area, 2024b)

Family	Species	Common Name
Asparagaceae	<i>Acanthocarpus preissii</i>	
Asparagaceae	<i>Lomandra maritima</i>	Maritime Mat Rush
Asteraceae	<i>Olearia axillaris</i>	Coastal Daisybush
Chenopodiaceae	<i>Enchylaena tomentosa</i>	Barrier Saltbush
Chenopodiaceae	<i>Rhagodia baccata</i>	Berry Saltbush
Cyperaceae	<i>Lepidosperma calcicola</i>	
Ericaceae	<i>Leucopogon parviflorus</i>	Coast Beard-heath
Fabaceae	<i>Acacia cyclops</i>	Coastal Wattle
Fabaceae	<i>Acacia saligna</i>	Orange Wattle
Fabaceae	<i>Acacia rostellifera</i>	Summer-scented Wattle
Fabaceae	<i>Hardenbergia comptoniana</i>	Native Wisteria
Haemodoraceae	<i>Conostylis aculeata</i>	Prickly Conostylis
Myrtaceae	<i>Melaleuca systema</i>	Coastal Honeymyrtle
Phyllanthaceae	<i>Lysiandra calycina</i>	False Boronia
Poaceae	<i>Austrostipa compressa</i>	
Poaceae	<i>Austrostipa flavescens</i>	
Polygalaceae	<i>Comesperma integerrimum</i>	
Proteaceae	<i>Banksia attenuata</i>	Slender Banksia
Proteaceae	<i>Banksia menziesii</i>	Firewood Banksia
Proteaceae	<i>Banksia prionotes</i>	Acorn Banksia
Proteaceae	<i>Hakea prostrata</i>	Harsh Hakea
Ranunculaceae	<i>Clematis linearifolia</i>	Slender Clematis
Restionaceae	<i>Desmocladius asper</i>	
Restionaceae	<i>Desmocladius flexuosus</i>	
Rhamnaceae	<i>Spyridium globulosum</i>	Basket Bush
Scrophulariaceae	<i>Eremophila glabra</i>	Tar Bush
Solanaceae	* <i>Solanum nigrum</i>	Black Berry Nightshade
Thymelaeaceae	<i>Pimelea argentea</i>	Silvery Leaved Pimelea
Xanthorrhoeaceae	<i>Xanthorrhoea preissii</i>	Grass Tree
Zamiaceae	<i>Macrozamia fraseri</i>	Sandplain Zamia

4.2.4 Threatened and Priority Communities

A threatened ecological community assessment was carried out in July 2024. Please refer to *Mindarie Regional Council Threatened Ecological Community Assessment Tamala Park* (Natural Area, 2024b).

4.3 Existing Adverse Site Conditions and Threats

4.3.1 Erosion and Surface Water Diversion

The infiltration pond will have rock pitched water entry points installed as part of the construction of the infiltration pond. This should reduce the likelihood of the infiltration pond eroding however should be monitored following major rains once constructed.

4.3.2 Weeds and Plant Pathogens

It is expected that there will be a large weed seed bank within the topsoil of the area. With water diverted into the pond, exacerbated by construction disturbance, it is expected that weeds will have a high impact and overtake disturbed areas within the site boundary and surrounding environment.

The infiltration pond site was assessed for dieback in 2024, however was classified as uninterpretable. Small, fragmented sections of susceptible vegetation were observed (Glevan, 2024).

4.3.3 Feral Animals

Rabbit scat and diggings were observed on site. The presence of rabbits within the site boundary could result in herbivory and negatively impact revegetation. Given the site is to be fenced, it is recommended that the fence include a skirt at a minimum length of 300 cm to keep pest species such as rabbits outside of the revegetation area. Any revegetation outside of the fenced area is recommended to have tree guards installed.

4.3.4 Rubbish

Large quantities of rubbish were observed within the site boundary and surrounding vegetation. Fencing will reduce the quantity of rubbish entering the site.



Figure 10: Rubbish present on site

5.0 Suitability of Reference Site

The following sections outline the process and methodology undertaken in selecting the reference site, as well as justification on the suitability of the reference site to inform this revegetation plan.

The quadrat data collected during the *Mindarie Regional Council 2016 Bushland Survey* (Natural Area, 2017) and *Mindarie Regional Council Threatened Ecological Community Assessment – Tamala Park* (Natural Area, 2024b) has been analysed to inform the development of an appropriate reference site for this revegetation plan. Reference site and quadrat locations are shown in Figure 11.

The *Mindarie Regional Council Threatened Ecological Community Assessment – Tamala Park* (Natural Area, 2024b) report provides additional baseline information on the site and outlines the methodology for the flora and vegetation survey and establishment of quadrats. This following was undertaken during the Natural Area (2024) survey:

- desktop survey and literature review
- outlines survey findings and methodology including:
 - three 10 x 10 m quadrats recording the upper middle and understorey as specified in the EPA technical guidance document (EPA, 2016) across the one vegetation type present
 - photographing each quadrat in the north-west corner and recording GPS coordinates
 - recording landscape characteristics including soil types/colour, aspect, slope, surface rock, topography and drainage using Natural Area’s modified recording sheets based on the NAIA templates developed for the Perth Biodiversity Project
 - determining leaf litter depth, percentage cover, and percentage of bare ground
 - recording percentage cover, height, number of alive/dead stems and life forms for each flora species in the quadrats
 - marking locations of any conservation significant flora, declared pests (DP) and/or weeds of national significance (WoNS) identified
 - recording vegetation type including dominant over, middle and understorey species and condition using the scale attributed to Keighery (Government of Western Australia, 2000)
 - the use of GPS to map significant species and boundaries of differing vegetation type and condition.

A summary of the results from the flora survey is listed below in Table 10. The average combined attributes indicate what target values should be considered when establishing completion criteria.

Table 10: Site species and attributes based on reference quadrats

Location	Q1	Q2	Q3	Q4	Average Combined Attributes
Vegetation Condition*	4	3	3	3	3
Vegetation Cover %					
Upper	20	35	15	0.0	17.5
Mid	14.6	16.6	19	76.0	31.55
Lower	28.7	26.5	43.2	31.8	32.55
Total	63.3	78.1	77.2	107.8	81.6
Species Richness	34	30	35	30	32
Gravel %	0	0	0	0	0
Rock %	0	0	0	0	0
Leaf Litter %	0	0	0	12	3
Bare Ground %	7	8	8	12	8.25
Vegetation Condition Key*					
Rating	Vegetation Condition				
0	Completely Degraded				
1	Degraded				
2	Good				
3	Very Good				
4	Excellent				
5	Pristine				

The target vegetation condition for the offset revegetation area is good. To increase the diversity opportunities, target attributes for the revegetation site have been determined using the *Mindarie Regional Council 2016 Bushland Survey* (Natural Area, 2017) and *Mindarie Regional Council Threatened Ecological Community Assessment – Tamala Park* (Natural Area, 2024b) undertaken for the Mindarie Regional Council. Quadrat data is outlined in Appendix 4.

378708 379056 379404 379752 380100

6492331
6491983
6491634
6491286
6490938
6490590

6492331
6491983
6491634
6491286
6490938
6490590



Figure 11:
Quadrat Locations



Tamala Park, City of Wanneroo

Legend

- ▭ Bush Forever 323 Boundary
- ▭ Site Boundary
- Quadrat Locations

Client: Mindarie Regional Council
 Date: 13/11/2024
 Created by: K.Evans
 Image Source: Nearmap, 2024
 Datum: GDA2020 / MGA zone 50
 Scale: 1: 8700

0 100 200 m



5.1 Species List and Density

An indicative species list for revegetation is provided in Table 11, which has been created based on the reference sites and the surrounding vegetation (*Banksia menziesii* open forest and *Spyridium globulosum* shrubland)

The flora species list aims to indicate species that could be included within the revegetation process, with the actual list being informed from seed collected for propagation during initial works and by those available from a nursery (or nurseries) contracted to provide the tubestock for the project.

Species strata selection is to occur at a rate of 1 upper strata species per 10 m² and 1:1 (middle: lower), to achieve a similar structure to the vegetation structure of the surrounding bushland.

Table 11: Indicative species list and plant quantities for revegetation

Species	Common Name	Revegetation Zone	Indicative Plant Numbers
Lower Strata			
<i>Acanthocarpus preissii</i>		X	
<i>Austrostipa compressa</i>		X	
<i>Clematis linearifolia</i>	Slender Clematis	X	2,750
<i>Conostylis aculeata</i>	Prickly Conostylis	X	
<i>Enchylaena tomentosa</i>	Barrier Saltbush	X	
<i>Hardenbergia comptoniana</i>	Native Wisteria	X	
Middle Strata			
<i>Acacia cyclops</i>	Coastal Wattle	X	
<i>Acacia pulchella</i>	Prickly Moses	X	
<i>Acacia rostellifera</i>	Summer-scented Wattle	X	
<i>Austrostipa flavescens</i>		X	
<i>Calothamnus quadrifidus</i>	One-sided Bottlebrush	X	
<i>Isopogon dubius</i>	Pincushion Coneflower	X	
<i>Leucopogon parviflorus</i>	Coast Beard-heath	X	1,375
<i>Macrozamia fraseri</i>	Sandplain Zamia	X	
<i>Melaleuca systena</i>	Coastal Honeymyrtle	X	
<i>Olearia axillaris</i>	Coastal Daisybush	X	
<i>Pimelea argentea</i>	Silvery Leaved Pimelea	X	
<i>Rhagodia baccata</i>	Berry Saltbush	X	
<i>Scaevola crassifolia</i>	Thick-leaved Fan-flower	X	

Species	Common Name	Revegetation Zone	Indicative Plant Numbers
<i>Spyridium globulosum</i>	Basket Bush	X	
<i>Templetonia retusa</i>	Cockies Tongues	X	
Black Cockatoo Foraging Species Middle Strata			
<i>Acacia saligna</i>	Orange Wattle	X	
<i>Banksia sessilis</i>	Parrot Bush	X	
<i>Hakea prostrata</i>	Harsh Hakea	X	
<i>Hakea trifurcata</i>		X	1,375
<i>Hakea varia</i>		X	
<i>Jacksonia furcellata</i>	Grey Stinkwood	X	
<i>Xanthorrhoea preissii</i>	Grass Tree	X	
Black Cockatoo Foraging Species Upper Strata			
<i>Banksia attenuata</i>	Slender Banksia	X	
<i>Banksia menziesii</i>	Firewood Banksia	X	
<i>Banksia prionotes</i>	Acorn Banksia	X	190
<i>Eucalyptus gomphocephala</i>	Tuart	X	

The proposed target density is 3 plants per m². To achieve this, it is recommended a total of 5,689 tubestock are planted during the initial planting event, with 1,707 tubestock planted during the year one infill planting event and 512 tubestock planted during the second year of infill planting. This will ensure that the density is maintained in the event of tubestock loss. Further infill planting should be undertaken as required to maintain the target density throughout the site. The location of the planting has been outlined in Figure 12.

Plants utilised should meet the following requirements:

- plants will be preferentially sourced from a Nursery Industry Accreditation Scheme Australia (NIASA) facility which will undertake dieback testing and can propagate majority of the stock from seed
- all plant stock and seed to be free from pest and diseases
- only healthy, true to form plants will be installed on site
- plant stock is (preferentially) propagated from provenance specific seed or from seed sourced as close to the appropriate provenance as possible
- plant stock to have a large healthy root system with no evidence of having been restricted or damaged (e.g. Root bound) and the root ball of the plant shall remain intact with only a minor amount of loose soil present.



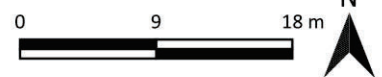
Figure 12:
Revegetation
Map

Tamala Park, City of Wanneroo

Legend

-  Site Boundary
-  Fenceline
-  Firebreak
-  Rock pitching
-  Basin (No Planting Zone)
-  Revegetation Area

Client: Mindarie Regional Council
Date: 20/12/2024
Created by: K.Evans
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 500



6.0 Completion Criteria

Monitoring activities will assess the success of the revegetation works by comparing the outcomes of monitoring to the completion criteria. The completion criteria outlined in Table 12 are to be achieved by the final monitoring event.

Monitoring and maintenance will be conducted for a period of 5 years following revegetation completion. If tubestock seedlings are planted at the optimum time of year and watering of plants occurs during the hottest months, losses can be minimised. Additional infill planting may be required in order to achieve completion criteria which can be sourced from the initial indicative planting list in Section 5.1.

Although the methodology has been prescribed in Section 7.0 to ensure the completion criteria stated are achieved, unforeseen site conditions may impede the desired outcomes. It is important that informal monitoring during maintenance events and formal monitoring guide the progression of the revegetation. Contingency actions and adaptive management recommendations below should be implemented if completion criteria are likely to not be met. If completion criteria are not met by the end of the defined establishment period further work should be carried out to ensure the best possible outcomes for the project.

Table 12: Completion Criteria and Contingency Actions

Completion Criteria	Potential Issue	Contingency Actions
Vegetation in good condition	Vegetation condition degraded or completely degraded	Determine factors reducing condition rating (species diversity, weed coverage etc.) and implement control measures.
Weed coverage < 15 %	Weed coverage > 15 %	Implement additional weed control events
	Adverse weather does not allow for weed control to occur	Implement weed control as weather permits
No WoNS or declared pest present within revegetation site	WoNS or DP present	Conduct targeted weed control events
Species richness consists of 80% of the species list (26 species)	Species richness consists of 80% of the species list	<ul style="list-style-type: none"> ▪ Conduct investigation into the likely cause (e.g. ecotoxicity, species not suitable for site conditions, adverse weather conditions) ▪ Assess species selected and review infill planting list ▪ Consider implementing additional infill planting ▪ Implement appropriate remedial actions for example:

Completion Criteria	Potential Issue	Contingency Actions
		<ul style="list-style-type: none"> - Implement watering events - Additional soil investigations - Implement pest management program - Install tree guards to plants outside of fenced area
Black cockatoo foraging species coverage > 60 %	Black cockatoo foraging species coverage < 60 %	<ul style="list-style-type: none"> ▪ Conduct investigation into the cause of deaths (Dieback etc.).
Vegetation coverage ≥ 80 % coverage	Vegetation coverage < 80 %	<ul style="list-style-type: none"> ▪ Conduct investigation into the likely cause (e.g. ecotoxicity, species not suitable for site conditions, adverse weather conditions) ▪ Assess species selected and review infill planting list ▪ Consider implementing additional infill planting ▪ Implement appropriate remedial actions for example: <ul style="list-style-type: none"> - Implement watering events - Additional soil investigations - Implement pest management program - Install tree guards to plants outside of fenced area
No rubbish present within the revegetation area	Rubbish present	<ul style="list-style-type: none"> ▪ Undertake rubbish removal ▪ Consider fence installation or installation of shade cloth to fence to reduce rubbish entering revegetation area.
No erosion present within revegetation site	Erosion present	<p>Undertake erosion control measures for example:</p> <ul style="list-style-type: none"> ▪ Matting and/or coir log installation ▪ Surface water diversion ▪ Consider installation of additional rock pitching ▪ Installation of habitat logs to slow down and divert water. <p>Consider implementing surface water management plan and/or follow management actions as per surface water management plan.</p>

6.1 Project Limitations and Potential Issues

Several project specific limitations are present which could limit the rehabilitation of the site. The following limitations have been considered during the planning stage of this project (Table 13). Limitations and potential issues should be assessed throughout the project during maintenance and monitoring events. At this time the Mindarie Regional Council should be made aware of any issues and the project should be driven by adaptive management throughout the project.

Table 13: Potential limitations and considerations

Potential Limitations/Issues	Considerations
Excessive weed load due to historic and current use of land	Consider undertaking additional weed control activities.
Excessive rubbish on site due to surrounding land use	Consider undertaking additional rubbish collection. Install, repair and maintain any barrier fencing surrounding revegetation site.
Damage to vegetation through herbivory	<ul style="list-style-type: none"> ▪ Consider fencing or maintain fence line surrounding revegetation area. ▪ Consider installation of tree guards to revegetation outside of fence line. ▪ Ensure tubestock species are hardened off prior to plant installation. ▪ Installation density expected to produce enough stems to offset herbivory ▪ Consider implementing pest control.
Acquiring local provenance seed and tubestock	<ul style="list-style-type: none"> ▪ Seed collection to occur across multiple collection events to capture diversity required. ▪ Seed to be provided to nursery for propagation in April of the year before planned planting activities. ▪ If local provenance seed is not collected, tubestock to be ordered by September the year prior to installation.
Erosion present on site	<ul style="list-style-type: none"> ▪ Consider undertaking erosion control activities ▪ Develop/ implement surface water management plan

7.0 Revegetation Methodology

7.1 Site Preparation

The infiltration pond is to be constructed prior to the revegetation of the site. This includes the installation of a firebreak, fence and rock pitching to channel water into the pond without causing erosion. As part of the construction, the base of the pond is to be ripped to promote water infiltration.

7.2 Revegetation Techniques

7.2.1 Seed Collection

An experienced revegetation seed collection consultant will be engaged to conduct seed collection throughout the bushland adjacent to the revegetation site and other nature reserves within the region to provide provenance specific seed which will produce a similar vegetation representation to the immediate area. Seed collectors will be licenced and ideally be accredited by the Revegetation Industry Association of Western Australia (RIAWA). All correct permissions are to be obtained prior to seed collectors mobilising. All seed is to be handled and stored under RIAWA standards at a minimum.

Seed collection and salvage should occur within the clearing boundary prior to clearing works being undertaken and continue for a minimum of one year prior to plant installation to ensure a range of diversity is captured. Seed collection events will need to obtain enough seed to produce the required 7,908 stems required for initial and infill planting events. Final seed weights will be determined by the species collected and availability.

7.2.2 Tubestock

Tubestock is to be installed after the first major rains following the construction of the infiltration pond. The following methodology will be used to install tubestock:

- tubestock will be installed utilising pottiputki's or augers as required
- one fertiliser tablet per tubestock will be incorporated into the hole at the time of planting
- all plants will be installed at a sufficient depth to enable the root ball of the tubestock to be below the surface of the soil
- soil surrounding the installed plant will be backfilled and patted down firmly to eliminate air pockets from forming around the root ball.

Infill planting is recommended in the second and third years to account for natural attrition of tubestock. Infill planting numbers have been estimated based on 30% of the original tubestock in year 2 and 30% in year 3 however, this is to be confirmed and adjusted based on observations made during monitoring and maintenance events. Beyond year three of revegetation events, infill planting numbers will be determined on an as needed basis.

7.3 Vegetation Establishment

The vegetation establishment period will extend for a period of 5 years following the completion of the initial planting works. During this period maintenance works such as weed control, erosion control repairs fencing repairs and infill planting will be implemented to increase the chance of tubestock survival.

7.4 Maintenance and Contingencies

Ongoing maintenance will be required to ensure success of the revegetation. Maintenance works are recommended and will include:

- weed control
- infill planting (if required)
- watering over the summer months (November to March) (if required)
- general maintenance events
- ongoing management recommendations.

7.4.1 Weed Control

Weeds within the site need to be controlled to allow native species to establish and to reduce the presence of exotic weeds. An integrated weed management plan will be implemented across the rehabilitation areas, consisting of chemical and mechanical methodologies.

Characteristics of a particular species determine the most appropriate type of weed control method/s and can typically be found on the FloraBase website (Western Australian Herbarium, 1998-2024). Recommended treatment types and methodology for the weeds present are described in Table 14.

Weed species listed as declared pests under the *Biosecurity and Agriculture Management Act 2007* (WA) requires the landowner to remove these species to reduce their impact and spread (DPIRD, 2023). A summary of the recommended treatment methods and optimal timing of herbicide application for each of the high and medium priority weed species is provided in Table 14; a summary of weed species recorded within the revegetation site prior to construction is located in Table 15.

The ecological impact and invasiveness ratings for the Swan Region (DBCA, 2016) was used as a tool to determine weed management priorities for the species recorded within the site. The prioritisation process can be used to inform management recommendations and treatment strategies for the species present through focusing on species with greatest ecological impact, as well as any site-specific requirements. Weed prioritisation according to ecological impact and invasiveness is summarised in Table 15.

Table 14: Treatment types for each targeted species and the application method (green indicates recommended weed control methodologies)

Treatment Number	Treatment Type	Targeted Species	Application Method and Comments
1	Non-selective (Glyphosate/Biactive Glyphosate)	Annual and perennial grass and broadleaf weeds	Spot spray target species
2	Grass selective (e.g. Fusilade)	Annual and perennial grasses	Spot spray - selective grass spray (will affect native grass species)
3	Selective (Metsulfuron)	Annual broadleaf weeds and bulbs	Spot spray – semi selective

Treatment Number	Treatment Type	Targeted Species	Application Method and Comments
4	Wick wipe (Glyphosate & Metsulfuron wipe)	One-leaf Cape Tulip	Wipe leaves with sponge prior to or just on flowering
5	Woody weeds (Triclopyr, Picloram, or Glyphosate)	Woody weeds and trees	Cut and paint, basal bark or drill and fill (method is species dependant as some are prone to suckering e.g. <i>Schinus terebinthifolia</i>)
6	Manual removal/hand weeding	Carnation weeds (<i>Euphorbia</i> sp.), Fleabane (<i>Erigeron</i> sp.) and other similar species including woody weed seedlings when small	Gloves required due to caustic sap of Carnation weeds. Manual removal can also include slashing
7	Selective (Triasulfuron)	Carnation weeds (<i>Euphorbia</i> sp.), Fleabane (<i>Erigeron</i> sp.) and other similar species including woody weed seedlings when small	Spot spray target species

(Source: Brown and Brooks, 2002; WA Herbarium, 1998-2024)

Table 15: Weed species, weed priority ranking (DBCA, 2016) and treatment recommendations

Species	Common Name	Weed Priority Ranking		Treatment Type (Table 14)	Optimal Treatment Timing
		Impact	Invasiveness		
<i>*Asparagus asparagoides</i>		H	R	3	Jul – Aug
<i>*Asphodelus fistulosus</i>	Onion Weed	U	R	3	Jul - Oct
<i>*Avena barbata</i>	Bearded Oat	H	R	1 or 2	Jul - Oct
<i>*Bartsia trixago</i>	Bartsia	U	R	1	Jul - Oct
<i>*Brassica ciliate</i>		H	R	1	Jul - Oct
<i>*Brassica tournefortii</i>	Mediterranean Turnip	H	R	1	Jul - Oct
<i>*Briza maxima</i>	Blowfly Grass	U	R	1 or 2	Jul - Oct
<i>*Bromus diandrus</i>	Great Brome	H	R	1 or 2	Jul - Oct
<i>*Carpobrotus edulis</i>	Hottentot Fig	H	R	1 or 6	Jun - Oct
<i>*Centaurea melitensis</i>	Maltese Cockspur	H	R	1	Jul - Oct
<i>*Diplotaxis tenuifolia</i>	Sand Rocket	L	S	1	Jul - Oct
<i>*Ehrharta longiflora</i>	Annual Veldt Grass	M	R	1 or 2	Jul - Oct
<i>*Erigeron sumatrensis</i>		M	R	1 or 6	Jun - Nov
<i>*Euphorbia peplus</i>		U	M	1	May – Nov

Species	Common Name	Weed Priority Ranking		Treatment Type (Table 14)	Optimal Treatment Timing
		Impact	Invasiveness		
<i>*Euphorbia terracina</i>	Geraldton Carnation Weed	H	R	1 or 6	May – Nov
<i>*Foeniculum vulgare</i>	Fennel	L	S	1 or 6	Jul – Oct
<i>*Galium mural</i>		L	R	1	Jul – Oct
<i>*Gaudium laevigatum</i>	Coast Teatree	H	R	5	Jan - Dec
<i>*Geranium molle</i>	Dove's Foot Cranesbill	L	M	1 and 3 or 6	Jul – Oct
<i>*Hypochaeris radicata</i>		H	R	1	Jul - Oct
<i>*Lactuca serriola</i>	Prickly Lettuce	H	R	1	Jul - Oct
<i>*Lagurus ovatus</i>	Hare's Tail Grass	H	R	1	Jul - Oct
<i>*Leontodon rhagadioloides</i>	Cretan Weed	U	U	1	Jul - Oct
<i>*Lolium rigidum</i>	Wimmera Ryegrass	H	R	1	Jul - Oct
<i>*Lysimachia arvensis</i>	Pimpernel	U	R	1	Jul - Oct
<i>*Malva parviflora</i>	Marshmallow	L	U	1	Jul - Oct
<i>*Medicago polymorpha</i>		U	R	1	Jul - Oct
<i>*Raphanus raphanistrum</i>	Wild Radish	U	M	1	Jul - Oct
<i>*Retama raetam</i>		H	R	5 or 6	Jan - Dec
<i>*Romulea rosea</i>	Guildford Grass	U	R	1 or 3	Jul - Oct
<i>*Silene gallica</i>	French Catchfly	L	M	1	Jul - Oct
<i>*Solanum nigrum</i>	Black Berry Nightshade	M	R	1 or 6	Jul - Jan
<i>*Sonchus oleraceus</i>	Common Sowthistle	U	R	1	Jul - Oct
<i>*Trachyandra divaricata</i>		M	R	1 and 3	Jun- Sep
<i>*Trifolium campestre</i>	Hop Clover	U	U	1	Jul - Oct
<i>*Verbesina encelioides</i>	Crownbeard	U	U	1 or 6	Jun - Feb

Metsulfuron application should occur once a year at the recommended dose to reduce the potential for residual effect in soils, which can lead to some species becoming resistant and death of non-target species. Herbicide application should always occur as per the manufacturer's usage and safety specifications as detailed on labels and Safety Data Sheets (SDS), which can be provided by the manufacturer or accessed online. Herbicide application works can enable the targeting and treatment of several species during the same management event.

7.4.2 Maintenance

Ongoing maintenance may be required to meet the completion criteria and is based on the outcomes from the revegetation monitoring and observations on site. Maintenance should be carried out by environmental specialists with experience in adaptive management and identifying threats and opportunities to revegetation outcomes. Maintenance tasks include:

- regular weed control events (autumn and spring)
- rubbish collection (on an as-needed basis)
- removal of tree guards once plants have become established (if required)
- watering (including wetting agent) at rate of 2L per plant per watering event during warmer months (November to March) for the first year of establishment (if required, depending on time of plant installation, seasonal variations and establishment success)
- infill planting (if required)
- ongoing management recommendations as per monitoring reports.

It is recommended that the revegetation area is subjected to ongoing weed control events to reduce competition with the native tubestock installed. The frequency of events will be on an as required basis to ensure natural regeneration of the native vegetation occurs. The revegetation area should be monitored following events such as drought or fire which may result in a decline in native vegetation. The decline in vegetation cover will allow colonising weed species to establish and outcompete the regeneration of native species. This can be managed by implementing further maintenance activities post drought or fire.

7.5 Hygiene Management

Hygiene management is an important component of any successful revegetation project as it can affect site compliance with success criteria. Hygiene management in terms of weeds and Dieback are discussed within this section.

7.5.1 Weed Hygiene

The introduction of weeds into a site can have negative effects on revegetation establishment. Weed seeds can be spread in a variety of ways, including on tools, equipment, and footwear. The following procedures should be implemented to mitigate the spread of weed seed as a result of revegetation activities:

- Ensure vehicle tyres/tracks are clean and free of weed seed when entering and exiting the site.
- Ensure equipment, tools and footwear are clean and free of weed seed when entering and exiting the site.
- Any weed material removed from site should be transported in a manner that prevents the spread of weed seed during transit.
- Any weed material that has not seeded or are able to reproduce vegetatively through suckers or bulbs can be removed from site and disposed of at an appropriate green waste disposal facility.
- Ensuring a clear vehicle accessway to limit the spread of weeds.

7.5.2 Dieback (*Phytophthora*) Hygiene

Best management practices for Dieback (*Phytophthora*) are recommended to be followed. *Phytophthora cinnamomi* or Dieback is an introduced fungal pathogen with a widespread distribution in areas of south-west Western Australia. The fungus acts by infecting the roots, absorbing the carbohydrates and nutrients

from the plants and causing the roots to rot. Dieback spreads quickly down slopes in surface and sub-surface water flow as well as uphill via root-to-root contact. Human activities cause the greatest spread of Dieback through the natural landscape. The pathogen can enter bushland sites via infected soil on footwear, vehicles and equipment.

Currently no method of completely eradicating *Phytophthora* has been discovered; as such management methods and objectives are geared toward minimising the spread into uninfected areas and to mitigate the impacts of the fungi where infections are present. Hygiene management at the site should be carried out in a manner that reduces the risk of moving infected material from one location to another.

The following precautions should be followed:

- Vehicles are to remain on designated vehicle tracks unless it is necessary for management purposes.
- All vehicles, equipment and footwear are to be free of soil/mud before entering and departing the project area.
- All personnel working at the site to wash down equipment and shoes prior to working on the site with a disinfectant solution, 70% disinfectant (methylated spirits) to 30% water. Cleaning of all tools, footwear and vehicle tyres should be conducted before and after working at the site (Figure 13).



Figure 13: Example washdown procedures of shoes and vehicles.

7.6 Monitoring and Reporting

Monitoring of revegetation success within the revegetation area is to occur once in autumn and spring for a period of five consecutive years after the initial planting. Example monitoring sheets have been provided in Appendix 5. Monitoring will involve:

- setting up a minimum of two photo monitoring points after initial planting has occurred, with photos taken in the same direction to enable comparison of plant growth and establishment over time
- establishing a minimum of four 5 x 5 m quadrats placed evenly across the rehabilitation site to monitor species survival, vegetation health, native species coverage and composition, weed species present and their density
- a general assessment of the entire site, considering maintenance issues, identification of potential success inhibiting factors, fauna presences and other relevant information
- provision of a yearly report to Mindarie Regional Council to determine any required management actions or requirements for infill planting.

Monitoring should be carried out by personnel with botanical knowledge and experience, either by Mindarie Regional Council or through use of a consultant and/or contractor.

8.0 Implementation Schedule

The proposed implementation schedule has been outlined in Table 16 below outlining the optimal timing for the initial and infill planting, weed control, and maintenance visits.

Table 16: Indicative implementation schedule for first three years financial years of revegetation works

	Year 1 FY											
Item	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Seed salvage (dependent on clearing schedule)												
Seed collection												
Propagation												
	Year 2 FY											
Procurement of tubestock (if not propagated)												
Weed control												
Plant installation												
	Year 3 FY											
Weed control												
Plant installation												
Maintenance event												
Monitoring												
Reporting												
	Year 4 FY											
Weed control												
Plant installation												
Maintenance event												
Monitoring												
Reporting												

9.0 References

- Biosecurity and Agriculture Management Act 2007* (WA). Retrieved from https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_2736_homepage.html
- Biodiversity Conservation Act 2016* (WA). Retrieved from https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_13811_homepage.html
- Brown, K., & Brooks, B. (2002). *Bushland Weeds –A practical guide to their management*. Greenwood, W.A: Environmental Weeds Action Network (Inc.).
- Bureau of Meteorology. (2024). *Climate and Weather Statistics – Gingin Aero ID 009178*, retrieved via: http://www.bom.gov.au/climate/averages/tables/cw_009965.shtml.
- Department of Biodiversity, Conservation and Attractions (DBCA). (2016) *Swan Impact and Invasiveness Ratings*. Retrieved from <https://www.dbca.wa.gov.au/management/threat-management/weeds>
- Department of Biodiversity, Conservation and Attractions (DBCA). (2023a). *NatureMap*. Prepared by the Species and Communities program for the Mindarie Regional Council and Natural Area for Basic Flora and Fauna Survey.
- Department of Biodiversity, Conservation and Attractions (DBCA). (2023b). *Threatened and Priority Flora Database Search for Tamala Park*, retrieved 4 September 2023. Prepared by the Species and Communities program for the Mindarie Regional Council and Natural Area for Basic Flora and Fauna Survey.
- Department of Biodiversity, Conservation and Attractions (DBCA). (2023c). *Threatened and Priority Ecological Communities Database Search for Tamala Park*, retrieved 4 September 2023. Prepared by the Species and Communities program for the Mindarie Regional Council and Natural Area for Basic Flora and Fauna Survey.
- Department of Biodiversity, Conservation and Attractions (DBCA). (2023d). *Threatened and Priority Fauna Database Search for Tamala Park*, retrieved 4 September 2023. Prepared by the Species and Communities program for the Mindarie Regional Council and Natural Area for Basic Flora and Fauna Survey.
- Department of Biodiversity, Conservation and Attractions (DBCA). (2023e). *Conservation Category Definitions for Western Australian Fauna and Flora*. Retrieved from <https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/Conservation%20code%20definitions.pdf>
- Department of Climate Change, Energy, the Environment and Water (DCCEEW). (2023). *Protected Matters Search Tool*. Retrieved from <http://www.environment.gov.au/epbc/pmst/>.

- Department of Climate Change, Energy, the Environment and Water. (2024). Interim Biogeographic Regionalisation for Australia (IBRA) Version 7 (Subregions) [Data set].
- Department of Primary Industries and Regional Development. (2019). 2 metre contours (DPIRD-072) [Data set]. <https://catalogue.data.wa.gov.au/dataset/dpird-2-metre-contours>
- Department of Primary Industries and Regional Development. (2022). Soil Landscape Mapping - Best Available (DPIRD-027) [Data set].
- Department of Primary Industries and Regional Development (DPIRD). (2024). Western Australian Organism List. Retrieved from <https://www.agric.wa.gov.au/bam/western-australian-organism-list-waol>
- Department of Planning, Land and Heritage. (2019). Bush Forever Areas 2000 (DPLH-019) [Data set].
- Department of Planning, Land and Heritage. (2024a). Aboriginal Cultural Heritage - Historic (DPLH-098) [Data set].
- Department of Planning, Land and Heritage. (2024b). Aboriginal Cultural Heritage - Register (DPLH-099) [Data set].
- Environment Protection and Biodiversity Conservation Act 1999* (Cwlth). Retrieved from <https://www.legislation.gov.au/Details/C2016C00777>
- Environmental Protection Authority. (2016). *Technical Guidance: Flora and Vegetation survey for Environmental Impact Assessment*. Retrieved from http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.
- Executive Steering Committee for Australian Vegetation Information (ESCAVI). (2003). Australian Vegetation Attribute Manual: National Vegetation Information System, Version 6.0. Department of Environment and Heritage, Canberra. Retrieved from <https://www.dcceew.gov.au/sites/default/files/env/pages/06613354-b8a0-4a0e-801e-65b118a89a2f/files/vegetation-attribute-manual-6.pdf>
- Glevan Consulting. (2024). *Natural Area Consulting Management Services- Tamala Park - Phytophthora Dieback occurrence assessment*. Report prepared for Natural Area Consulting Management Services.
- Government of Western Australia. (2000). *Bush Forever (Vol. 2)*. Department of Environmental Protection, Perth, Western Australia.
- Government of Western Australia. (2019). *2018 South West Vegetation Complex Statistics. Current as of March 2019*. Perth, W.A.: Department of Biodiversity, Conservation and Attractions. Retrieved from <https://catalogue.data.wa.gov.au/dataset/dbca>

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

Mitchell, D., Williams, K., & Desmond, A. (2002). *Swan Coastal Plain 2 (SWA2 – Swan Coastal Plain subregion)*. In *A biodiversity audit of Western Australia's 53 Biogeographical Subregions* (pp. 606-623). Perth, WA: Department of Conservation and Land Management.

Natural Area Consulting Management Services. (2024a). *Mindarie Regional Council Flora and Fauna Survey Areas - 1 and 2*. Unpublished report prepared for Mindarie Regional Council

Natural Area Consulting Management Services. (2024b). *Mindarie Regional Council TEC Assessment -Tamala Park*. Unpublished report prepared for Mindarie Regional Council

Western Australian (WA) Herbarium. (1998-). *FloraBase – The Western Australian Flora*. Retrieved from <https://florabase.dpaw.wa.gov.au/>.

Appendix 1: PMST Report 10 km



EPBC Act Protected Matters Report

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

Report created: 15-Nov-2023

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	56
Listed Migratory Species:	48

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	46
Commonwealth Heritage Places:	None
Listed Marine Species:	74
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	2
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	7
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	60
Key Ecological Features (Marine):	2
Biologically Important Areas:	10
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

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

Feature Name

Buffer Status

Commonwealth Marine Areas (EPBC Act)

In buffer area only

Listed Threatened Ecological Communities

[\[Resource Information \]](#)

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

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name

Threatened Category

Presence Text

Buffer Status

[Banksia Woodlands of the Swan Coastal Plain ecological community](#)

Endangered

Community likely to occur within area

In feature area

[Empodisma peatlands of southwestern Australia](#)

Endangered

Community may occur within area

In buffer area only

[Tuart \(Eucalyptus gomphocephala\) Woodlands and Forests of the Swan Coastal Plain ecological community](#)

Critically Endangered

Community likely to occur within area

In feature area

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

Buffer Status

BIRD

[Anous tenuirostris melanops](#)

Australian Lesser Noddy [26000]

Vulnerable

Species or species habitat may occur within area

In buffer area only

[Botaurus poiciloptilus](#)

Australasian Bittern [1001]

Endangered

Species or species habitat may occur within area

In buffer area only

[Calidris canutus](#)

Red Knot, Knot [855]

Endangered

Species or species habitat likely to occur within area

In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Zanda latirostris listed as Calyptorhynchus latirostris			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding known to occur within area	In feature area
FISH			
Thunnus maccoyii			
Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
INSECT			
Hesperocolletes douglasi			
Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area	In feature area
MAMMAL			
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Dasyurus geoffroi			
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eubalaena australis			
Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Macroderma gigas			
Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In feature area
Neophoca cinerea			
Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat likely to occur within area	In buffer area only
PLANT			
Andersonia gracilis			
Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area	In feature area
Anigozanthos viridis subsp. terraspectans			
Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Banksia mimica			
Summer Honeypot [82765]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat may occur within area	In buffer area only
Caleana dixonii listed as Paracaleana dixonii Sandplain Duck Orchid [87944]	Endangered	Species or species habitat may occur within area	In buffer area only
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area	In buffer area only
Drakaea elastica Glossy-leaved Hammer Orchid, Glossy- leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area	In feature area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Eucalyptus argutifolia Yanchep Mallee, Wabbling Hill Mallee [24263]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macarthuria keigheryi Keighery's Macarthuria [64930]	Endangered	Species or species habitat may occur within area	In buffer area only
Marianthus paralius [83925]	Endangered	Species or species habitat known to occur within area	In feature area
Melaleuca sp. Wanneroo (G.J. Keighery 16705) [89456]	Endangered	Species or species habitat known to occur within area	In buffer area only

REPTILE

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

SHARK

Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only

Listed Migratory Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat may occur within area	In buffer area only
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Hydroprogne caspia Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Onychoprion anaethetus Bridled Tern [82845]		Breeding known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Marine Species			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In buffer area only
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Terrestrial Species			
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

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

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [50574]	WA	In buffer area only
Commonwealth Land - [50575]	WA	In buffer area only
Commonwealth Land - [50587]	WA	In buffer area only
Commonwealth Land - [50586]	WA	In buffer area only
Commonwealth Land - [50585]	WA	In buffer area only
Commonwealth Land - [50584]	WA	In buffer area only
Commonwealth Land - [50582]	WA	In buffer area only
Commonwealth Land - [50583]	WA	In buffer area only
Commonwealth Land - [50588]	WA	In buffer area only
Commonwealth Land - [50489]	WA	In buffer area only
Commonwealth Land - [50553]	WA	In buffer area only
Commonwealth Land - [50711]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50668]	WA	In buffer area only
Commonwealth Land - [50559]	WA	In buffer area only
Commonwealth Land - [50667]	WA	In buffer area only
Commonwealth Land - [50576]	WA	In buffer area only
Commonwealth Land - [50626]	WA	In buffer area only
Commonwealth Land - [50439]	WA	In buffer area only
Commonwealth Land - [50606]	WA	In buffer area only
Commonwealth Land - [50598]	WA	In buffer area only
Commonwealth Land - [50430]	WA	In buffer area only
Commonwealth Land - [50625]	WA	In buffer area only
Commonwealth Land - [50413]	WA	In buffer area only
Commonwealth Land - [50436]	WA	In buffer area only
Commonwealth Land - [50593]	WA	In buffer area only
Commonwealth Land - [51118]	WA	In buffer area only
Commonwealth Land - [50410]	WA	In buffer area only
Commonwealth Land - [50682]	WA	In buffer area only
Commonwealth Land - [50594]	WA	In buffer area only
Commonwealth Land - [50355]	WA	In buffer area only
Commonwealth Land - [50562]	WA	In buffer area only
Commonwealth Land - [50563]	WA	In buffer area only
Commonwealth Land - [50315]	WA	In buffer area only
Commonwealth Land - [50316]	WA	In buffer area only
Commonwealth Land - [50494]	WA	In buffer area only
Commonwealth Land - [50592]	WA	In buffer area only
Commonwealth Land - [50440]	WA	In buffer area only
Commonwealth Land - [50271]	WA	In buffer area only
Commonwealth Land - [50448]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51120]	WA	In buffer area only
Commonwealth Land - [50502]	WA	In buffer area only
Commonwealth Land - [50508]	WA	In buffer area only
Commonwealth Land - [50630]	WA	In buffer area only
Commonwealth Land - [50560]	WA	In buffer area only
Commonwealth Land - [51111]	WA	In buffer area only
Commonwealth Land - [50561]	WA	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus			
Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
Anous tenuirostris melanops			
Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus			
Sooty Shearwater [82651]		Species or species habitat may occur within area	In buffer area only
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Larus pacificus Pacific Gull [811]		Foraging, feeding or related behaviour may occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat likely to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Onychoprion anaethetus as Sterna anaethetus Bridled Tern [82845]		Breeding known to occur within area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In buffer area only
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Puffinus assimilis Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat may occur within area overfly marine area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Fish			
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In buffer area only
Campichthys galei Gale's Pipefish [66191]		Species or species habitat may occur within area	In buffer area only
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area	In buffer area only
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area	In buffer area only
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In buffer area only
Hippocampus subelongatus West Australian Seahorse [66722]		Species or species habitat may occur within area	In buffer area only
Lissocampus fatiloquus Prophet's Pipefish [66250]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
Mitotichthys meraculus Western Crested Pipefish [66259]		Species or species habitat may occur within area	In buffer area only
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area	In buffer area only
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In buffer area only
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In buffer area only
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In buffer area only
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In buffer area only
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In buffer area only
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
Mammal			
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In buffer area only
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Reptile			
Aipysurus pooleorum Shark Bay Seasnake [66061]		Species or species habitat may occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area	In buffer area only

Whales and Other Cetaceans [[Resource Information](#)]

Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Australian Marine Parks			[Resource Information]
Park Name	Zone & IUCN Categories	Buffer Status	
Two Rocks	Multiple Use Zone (IUCN VI)	In buffer area only	
Two Rocks	National Park Zone (IUCN II)	In buffer area only	

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Lake Joondalup	Nature Reserve	WA	In buffer area only
Marmion	Marine Park	WA	In buffer area only
Neerabup	National Park	WA	In buffer area only
Neerabup	Nature Reserve	WA	In buffer area only
Unnamed WA21176	5(1)(h) Reserve	WA	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Unnamed WA43290	Conservation Park	WA	In buffer area only
Woodvale	5(1)(h) Reserve	WA	In buffer area only

Nationally Important Wetlands [\[Resource Information \]](#)

Wetland Name	State	Buffer Status
Joondalup Lake	WA	In buffer area only

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Alkimos Seawater Desalination	2019/8453		Assessment	In buffer area only
Carabooda Quarry	2023/09554		Referral Decision	In buffer area only
Expansion of Limestone Extraction	2022/09324		Assessment	In buffer area only
Land clearing for timber storage	2022/09367		Assessment	In buffer area only
Land Development, James Street and Well Street, East Wanneroo, Elberton Property	2021/9106		Assessment	In buffer area only
Wattle Avenue East Quarry	2022/09326		Referral Decision	In buffer area only

Controlled action

Alkimos city centre and central development, WA	2015/7561	Controlled Action	Post-Approval	In buffer area only
Alkimos Coastal Node	2020/8861	Controlled Action	Further Information Request	In buffer area only
Butler North District Open Space playing fields development, Wanneroo, WA	2017/8053	Controlled Action	Post-Approval	In buffer area only
Catalina Residential Development	2010/5785	Controlled Action	Post-Approval	In feature area
Excavate sand and limestone resources	2010/5621	Controlled Action	Completed	In buffer area only
Jindee Residential Development	2012/6631	Controlled Action	Post-Approval	In buffer area only
Limestone extraction on Lot 8 Wattle Avenue, Nowergup	2013/6767	Controlled Action	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Lot 1665 Wanneroo Road, Sinagra.	2017/7921	Controlled Action	Post-Approval	In buffer area only
Lot 9000 Wanneroo Road Sinagra Mixed Use Development, Western Australia	2020/8798	Controlled Action	Proposed Decision	In buffer area only
Meridian Business Park Industrial Development	2007/3479	Controlled Action	Post-Approval	In buffer area only
Mitchell Freeway Extension and Wanneroo Road Upgrade, WA	2018/8367	Controlled Action	Post-Approval	In buffer area only
Mitchell Freeway Extension between Burns Beach Rd and Hester Av, Neerabup, WA	2013/7091	Controlled Action	Post-Approval	In buffer area only
Mitchell Freeway Principal Shared Path Gaps Project Ocean Reef Road to Hepburn Avenue	2020/8833	Controlled Action	Post-Approval	In buffer area only
National Lifestyle Villages Development	2011/6020	Controlled Action	Post-Approval	In buffer area only
Nava-1 Cable System	2001/510	Controlled Action	Completed	In buffer area only
Neerabup Industrial Area, WA	2021/8917	Controlled Action	Assessment Approach	In buffer area only
Neerabup Industrial Estate, Lot 701 Flynn Drive Neerabup WA	2012/6424	Controlled Action	Post-Approval	In buffer area only
Ocean Reef Marina Development	2009/4937	Controlled Action	Completed	In buffer area only
Proposed Urban Development of Lots 1005 & 1006	2008/4638	Controlled Action	Post-Approval	In buffer area only
Residential development Lot 1004 Alkimos WA	2011/5902	Controlled Action	Post-Approval	In buffer area only
Shark Hazard Mitigation Drum Line Program, WA	2014/7174	Controlled Action	Completed	In buffer area only
Subdivision of Lot 902 Flynn Drive Neerabup for Industrial Development	2021/8977	Controlled Action	Assessment Approach	In buffer area only
Urban and Residential Development at Lot 9 Brighton	2011/6137	Controlled Action	Post-Approval	In buffer area only
Urban development in accordance with the Local Structure Plan	2008/4601	Controlled Action	Post-Approval	In buffer area only
Urban Residential Development at Lot 9049 Marmoin Avenue	2009/5155	Controlled Action	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Vegetation Clearing, Wannaroo Rd and Nowergup Rd	2011/5955	Controlled Action	Completed	In buffer area only
Not controlled action				
Alkimos seawater desalination plant, offshore investigations, WA	2018/8224	Not Controlled Action	Completed	In buffer area only
APX-West Fibre-optic telecommunications cable system, WA to Singapore	2013/7102	Not Controlled Action	Completed	In buffer area only
Butler Railway Extension Project - Nowergup Depot Eastern Alignment	2011/5989	Not Controlled Action	Completed	In buffer area only
Commercial development of Lot 9004 Hodges Drive, Joondalup, WA	2016/7844	Not Controlled Action	Completed	In buffer area only
Connect Joondalup - Lot 9000 McLarty Ave and Lot 999 Piccadilly Circus, Joondalup, WA	2016/7758	Not Controlled Action	Completed	In buffer area only
Container Deposit Scheme Project	2019/8517	Not Controlled Action	Completed	In feature area
Development of ECU Engineering Annex, Joondalup Campus, WA	2017/7995	Not Controlled Action	Completed	In buffer area only
Development of new Alkimos Wastewater Treatment Plant	2007/3259	Not Controlled Action	Completed	In buffer area only
Eradication of the European House Borer, Perth metropolitan area, WA	2009/5027	Not Controlled Action	Completed	In buffer area only
Extension of 7.5km of the Joondalup Line electrified passenger railway from Cla	2010/5632	Not Controlled Action	Completed	In buffer area only
Flynn Drive / Pinjar Road Intersection Works, Lot 9000 Flynn Drive, Neerabup, WA	2017/7983	Not Controlled Action	Completed	In buffer area only
Groundwater Replenishment Scheme (GWRS) Stage 2	2016/7786	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO West Submarine Telecommunications Cable, WA	2017/8126	Not Controlled Action	Completed	In buffer area only
Nowergup Strawberry Farm McLennan Drive, Nowergup, WA	2017/8042	Not Controlled Action	Completed	In buffer area only
Ocean Reef Marina Development, City of Joondalup, WA	2014/7237	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Pinjar Motorcycle Park Raceway Development	2012/6419	Not Controlled Action	Completed	In buffer area only
Quinns Main sewer extension, Clarkson - Neerabup, WA	2018/8215	Not Controlled Action	Completed	In buffer area only
Realignment of Flynn Drive	2011/6170	Not Controlled Action	Completed	In buffer area only
Residential Development, Lot 4 Coogee Road, Mariginiup, WA	2019/8452	Not Controlled Action	Completed	In buffer area only
Residential Development, Lots 10 Dundobar Road and 28 and 29 Belgrade Road, East Wanneroo, WA	2019/8521	Not Controlled Action	Completed	In buffer area only
Residential development of 118 Coogee Road, Mariginiup, WA	2017/8011	Not Controlled Action	Completed	In buffer area only
Residential Subdivision - Lots 12, 36 & 38 Capron St, Wanneroo	2012/6409	Not Controlled Action	Completed	In buffer area only
Seismic Survey, Bremer Basin, Mentelle Basin and Zeewyck Sub-basin	2004/1700	Not Controlled Action	Completed	In buffer area only
Wanneroo Road Duplication, WA	2015/7632	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Laying a submarine optical fibre telecommunications cable, Perth to Singapore and Jakarta	2014/7332	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Road realignment and widening	2009/4926	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Subdivision Lot 4 Flynn Drive and earthworks for industrial development, 240 Fl	2009/5028	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

Key Ecological Features

[\[Resource Information \]](#)

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

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

Name	Region	Buffer Status
Western rock lobster	South-west	In buffer area only

Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
-----------------	-----------	----------	---------------

Seabirds

[Ardenna pacifica](#)

Wedge-tailed Shearwater [84292]	Foraging (in high numbers)	Known to occur	In buffer area only
---------------------------------	----------------------------	----------------	---------------------

[Hydroprogne caspia](#)

Caspian Tern [808]	Foraging (provisioning young)	Known to occur	In buffer area only
--------------------	-------------------------------	----------------	---------------------

[Larus pacificus](#)

Pacific Gull [811]	Foraging (in high numbers)	Former Range	In buffer area only
--------------------	----------------------------	--------------	---------------------

[Onychoprion anaethetus](#)

Bridled Tern [82845]	Foraging (in high numbers)	Known to occur	In buffer area only
----------------------	----------------------------	----------------	---------------------

[Puffinus assimilis tunneyi](#)

Little Shearwater [59363]	Foraging (in high numbers)	Known to occur	In buffer area only
---------------------------	----------------------------	----------------	---------------------

[Sterna dougallii](#)

Roseate Tern [817]	Foraging	Known to occur	In feature area
--------------------	----------	----------------	-----------------

[Sternula nereis](#)

Fairy Tern [82949]	Foraging (in high numbers)	Known to occur	In buffer area only
--------------------	----------------------------	----------------	---------------------

Seals

[Neophoca cinerea](#)

Australian Sea Lion [22]	Foraging (male)	Likely to occur	In buffer area only
--------------------------	-----------------	-----------------	---------------------

Whales

[Balaenoptera musculus brevicauda](#)

Pygmy Blue Whale [81317]	Distribution	Known to occur	In buffer area only
--------------------------	--------------	----------------	---------------------

[Megaptera novaeangliae](#)

Humpback Whale [38]	Migration (north and south)	Known to occur	In buffer area only
---------------------	-----------------------------	----------------	---------------------

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Please feel free to provide feedback via the [Contact us](#) page.

[© Commonwealth of Australia](#)

Department of Climate Change, Energy, the Environment and Water


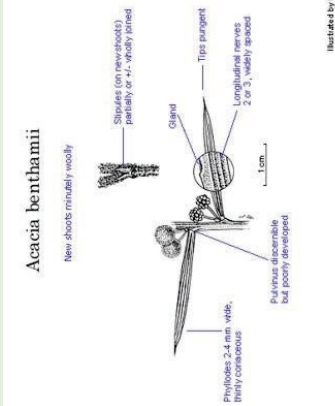

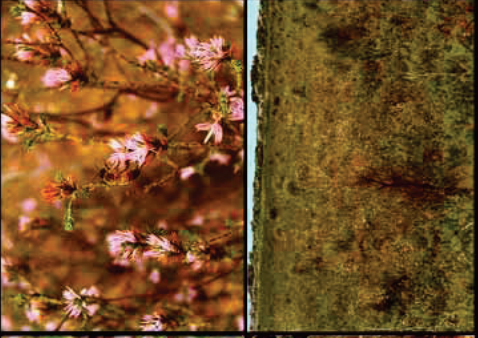
GPO Box 3090



Canberra ACT 2601 Australia

+61 2 6274 1111





Appendix 2: Significant Species

Conservation significant species potentially found in the area green indicates habitat is suitable for the species.

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Acacia benthamii</i> Photo: B. R. Maslin</p>	 <p><i>Acacia benthamii</i> New shoots minutely woolly</p> <p>Stipules (on new shoots) partially or +/- woolly pointed</p> <p>Clared</p> <p>Tip purplish</p> <p>Longitudinal nerves 2 or 3, weakly apiculate</p> <p>Phyllodes 2-4 mm wide, finely crenaceous</p> <p>Pulvinus discernible but poorly developed</p> <p>1 cm</p> <p>Illustrated by:</p>	Aug to Sep.	Typically on limestone breakaways.	P2	Y	Habitat and soil suitable
 <p><i>Andersonia gracilis</i></p>		Sep to Nov.	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	T	N	Habitat not suitable

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
Dwarf Green Kangaroo Paw	Rhizomatous, perennial, herb, 0.05-0.2 m high. Fl. green/yellow-green	Aug to Sep.	Grey sand, clay loam. Winter-wet depressions.	T	N	Habitat not suitable
<i>Anigozanthos viridis</i> subsp. <i>terraspectans</i>						
<i>Austrostipa mundula</i>						
	No information.			P3	N	Habitat not suitable



Midarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
<i>Baeckea</i> sp. Limestone	No information.			P1	N	Habitat not suitable
 	<p>Prostrate, lignotuberous shrub, 0.15-0.4 m high</p>	<p>Fl. yellow-brown, Dec or Jan to Feb.</p>	<p>White or grey sand over laterite, sandy loam.</p>	T	N	Habitat not suitable
 						

Photos: A.P. Brown & S. Patrick

Banksia mimica

Midarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
  <i>Caladenia huegelii</i> <small>Photos: I. & M. Greeve & J.L. Robson</small>	Tuberous, perennial, herb, 0.25-0.6 m high. Fl. green & cream & red.	Sep to Oct.	Grey or brown sand, clay loam.	T	N	Habitat not suitable
 <i>Calceotasia elegans</i>	No information.			P2	N	Habitat not suitable






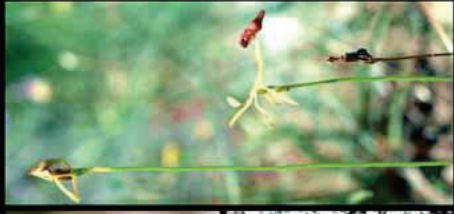

Midarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
<i>Conostylis bracteata</i>	Rhizomatous, tufted or shortly proliferous perennial, grass-like or herb, 0.2-0.45 m high. Fl. Yellow.	Aug to Sep.	Sand, limestone. Consolidated sand dunes.	P3	Y	Habitat and soil suitable
<i>Cyathochaeta teretifolia</i>	Rhizomatous, clumped, robust perennial, grass-like or herb (sedge), to 2 m high, to 1.0 m wide. Fl. Brown.	No information.	Grey sand, sandy clay. Swamps, creek edges.	P3	N	Habitat not suitable
<i>Diuris micrantha</i>	Tuberous, perennial, herb, 0.3-0.6 m high. Fl. yellow & brown.	Sep to Oct.	Brown loamy clay. Winter-wet swamps, in shallow water.	T	N	Habitat not suitable





Photos: A.P. Brown, I. & M. Greeve & B. Jackson

Midarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
   <i>Diuris purdiei</i>	<p>Tuberous, perennial, herb, 0.15-0.35 m high.</p> <p>Purdie's Donkey Orchid</p>	<p>Fl. yellow, Sep to Oct.</p>	<p>Grey-black sand, moist. Winter-wet swamps.</p>	T	N	Habitat not suitable
    <i>Drakaea elastica</i>	<p>Tuberous, perennial, herb, 0.12-0.3 m high.</p> <p>Glossy-leaved Hammer Orchid</p>	<p>Oct to Nov.</p>	<p>White or grey sand. Low-lying situations adjoining winter-wet swamps.</p>	T	N	Habitat not suitable


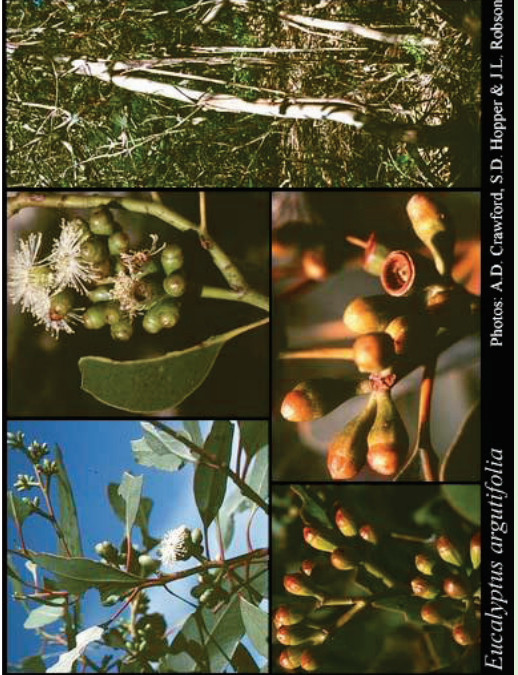
Midarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
	<p>Tuberous, perennial, herb, 0.15-0.3 m high. Fl. red & yellow.</p>	<p>Sep to Oct.</p>	<p>White-grey sand.</p>	<p>T</p>	<p>N</p>	<p>Habitat not suitable</p>
	<p>Fibrous-rooted perennial, herb, to 0.06 m high. Fl. green-pink.</p>	<p>Nov to Dec or Jan to Mar.</p>	<p>Peaty sand. Along lake margins, close to winter high-water line.</p>	<p>P1</p>	<p>N</p>	<p>Habitat not suitable</p>


Drosera micrantha
Photos: S.D. Hopper, A.P. Brown & I. & M. Greeve

Drosera x sidjamesii




Mindarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Eleocharis keigheryi</i> Photo: G.J. Keighery</p>	<p>Rhizomatous, clumped perennial, grass-like or herb (sedge), to 0.4 m high. Fl. Green.</p>	<p>Aug to Nov.</p>	<p>Clay, sandy loam. Emergent in freshwater: creeks, claypans.</p>	<p>T</p>	<p>N</p>	<p>Habitat not suitable</p>
 <p><i>Eucalyptus argutifolia</i> Photos: A.D. Crawford, S.D. Hopper & J.L. Robson</p>	<p>Wabbling Hill Mallee (Mallee), 1.5-4 m high, bark smooth. Fl. White.</p>	<p>Mar to Apr.</p>	<p>Shallow soils over limestone. Slopes or gullies of limestone ridges, outcrops.</p>	<p>T</p>	<p>Y</p>	<p>Habitat and soil suitable</p>

Midarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Eucalyptus foecunda</i> subsp. <i>foecunda</i></p> <p><i>Eucalyptus foecunda</i></p>	Sand dunes and plains, limestone ridges, cliffs & hills, road verges.			P4	Y	Habitat and soil suitable
<i>Fabronia hampeana</i>	No Information			P2	N	Habitat not suitable
<i>Grevillea</i> sp. <i>Ocean Reef</i> (D. Pike Joon 4)	No Information			P1	N	Habitat not suitable
<i>Hibbertia leptotheca</i>	No information.			P3	N	Habitat not suitable

Mindarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
  <i>Jacksonia gracillima</i>	No information.			P3	N	Habitat not suitable
 <i>Jacksonia sericea</i>	Low spreading shrub, to 0.6 m high. Fl. Orange.	usually Dec or Jan to Feb.	Calcareous & sandy soils.	P4	N	Habitat not suitable

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
-------------	-------------	------------------	--------------	-----------	------------------	---------

<i>Lecanea turicensis</i> var. <i>turicensis</i>	No Information			P2	N	Habitat not suitable
--------------------------------------------------	----------------	--	--	----	---	----------------------

Leucopogon maritimus

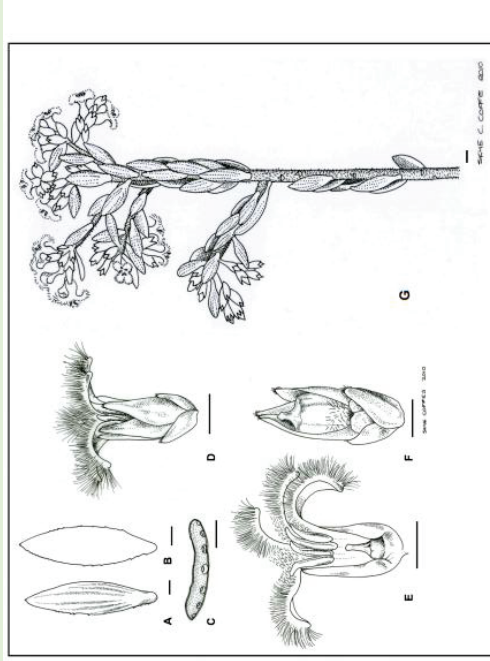




Figure 1. *Leucopogon maritimus*. A – leaf, abaxial surface; B – leaf, adaxial surface; C – leaf section; D – flower; E – flower, longitudinal section; F – fruit; G – flowering branchlet. Scale bars: all = 1 mm. Drawn by Skye Coffey from *M. Hitchcock* 3769 (A–F), *M. Hitchcock* 3792 (G).


Low, spreading shrubs to c. 40 cm high and 60 cm wide, often multi-stemmed close to the base but single-stemmed at ground level with a fire-sensitive rootstock.

Restricted to near-coastal Quindalup dunes, from a small area of coastline about 40–70 km north of Perth


Habitat and soil suitable

Midarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

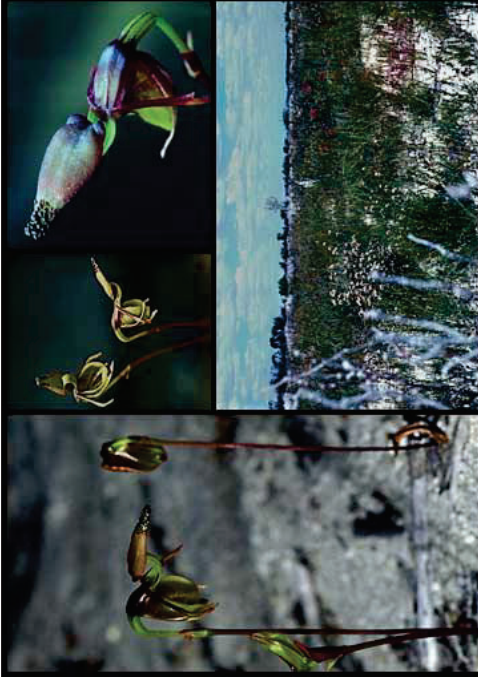

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Leicopogon</i> sp. Yancheep (M. Hislop 1986) Photos: M. Hislop</p>	<p>Erect shrub, 0.15-1 m high, to 0.6 m wide. Fl. white/pink.</p>	<p>Apr to Jun or Sep.</p>	<p>Light grey-yellow sand, brown loam, limestone, laterite, granite. Coastal plain, breakaways, valley slopes, low hills.</p>	<p>P3</p>	<p>Y</p>	<p>Habitat and soil suitable</p>
 <p><i>Macarthuria keigheryi</i> Photos: G.J. Keighery</p>	<p>Erect or spreading perennial, herb or shrub, 0.2-0.4 m high, 0.3-0.6 m wide.</p>	<p>Sep to Dec or Feb to Mar.</p>	<p>White or grey sand.</p>	<p>T</p>	<p>Y</p>	<p>Habitat and soil suitable</p>

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Marianthus paralius</i></p>	<p>Almost prostrate, eventually scandent, woody shrub. Fl. Red.</p>	<p>Sep to Nov.</p>	<p>White sand over limestone. Low coastal cliffs.</p>	<p>T</p>	<p>Y</p>	<p>Habitat and soil suitable</p>


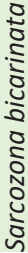
Mindarie Regional Council
 Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Melaleuca sp. Wanneroo</i></p>	No information.			T	Y	Habitat and soil suitable

Midarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
<i>Netrostylis</i> sp. Chandala (G.J. Keighery 17055)	No information.			P2	N	Habitat not suitable
 <p><i>Paracaleana dixonii</i></p> <p>Photos: G. Brockman, A.P. Brown & J. & M. Greeve</p>	tuberous, perennial, herb, 0.09-0.2 m high. Fl. yellow-brown.	Oct to Dec or Jan.	Grey sand over granite.	T	N	Habitat not suitable
 <p><i>Pimelea calcicola</i></p> <p>Photos: I.R. Dixon</p>	Erect to spreading shrub, 0.2-1 m high. Fl. Pink.	Sep to Nov.	Sand. Coastal limestone ridges.	P3	Y	Habitat and soil suitable




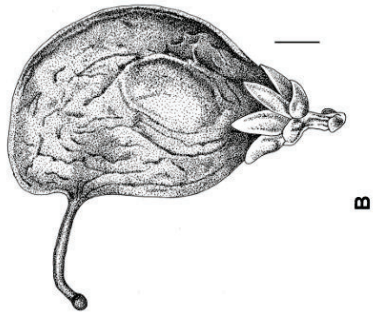
Mindarie Regional Council
 Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Paranthera moorokatta</i></p>	No information.			P2	N	Habitat not suitable
 <p><i>Sarcozona bicarinata</i></p>	Shrub, ca 0.1 m high. Fl. White.	Aug.	White sand.	P3	Y	Habitat and soil suitable


Mindarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Stylidium maritimum</i></p> <p>Photos: K. C. Richardson</p>	<p>Caespitose perennial, herb, 0.3-0.7 m high, Leaves tufted, linear to narrowly oblanceolate, 10-40 cm long, 1-5.5 mm wide, apex acute to mucronate, margin involute, glabrous. Membraneous scale leaves present at base of mature leaves. Scape glandular throughout. Inflorescence paniculate. Fl. white/purple.</p>	Sep to Nov.	Sand over limestone. Dune slopes and flats. Coastal heath and shrubland, open Banksia woodland.	P3	Y	Habitat and soil suitable
<i>Stylidium paludicola</i>	<p>Reed-like perennial, herb, 0.35-1 m high, Leaves tufted, linear or subulate or narrowly oblanceolate, 0.5-4 cm long, 0.5-1.5 mm wide, apex acute,</p>	Oct to Dec.	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.	P3	N	Habitat not suitable

Mindarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
		margin entire, glabrous. Scape mostly glabrous, inflorescence axis glandular. Inflorescence racemose. Fl. Pink.				
<i>Stypelia filifolia</i>	Usually erect shrubs to c. 150 cm high and 150 cm wide, but occasionally low and spreading, from a fire-sensitive rootstock. Leaves helically arranged, variably orientated, usually rather steeply antrorse but occasionally with	September and November.	Has a scattered distribution in the Geraldton Sandplains and Swan Coastal Plain bioregions, Almost all records are from sandy soils on the coastal plain and in association with Banksia woodland	P3	N	Habitat not suitable
						

Midarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
	some leaves shallowly antorse to retrorse					
 <p><i>Thelymitra variegata</i></p> <p>Photos: S.D. Hopper & G. Brummbauer</p>	<p>Tuberous, perennial, herb, 0.1-0.35 m high.</p> <p>Fl. orange & red & purple & pink</p>	Jun to Sep.	Sandy clay, sand, laterite.	P2	N	Habitat not suitable
<i>Utricularia oppositiflora</i>	No information			P3	N	Habitat not suitable

Appendix 3: Conservation Codes

Western Australia

Conservation Code	Name	Description
T	Threatened	Flora or fauna that is rare or likely to become extinct, ranked according to their level of threat using IUCN Red List criteria (Schedules 1-3 of the Wildlife Conservation (Specially Protected Fauna) Notice or the Wildlife Conservation (Rare Flora) Notice)
CR	Critically endangered	Species considered to be facing an extremely high risk of extinction within the wild in the immediate future
EN	Endangered	Species considered to be facing a very high risk of extinction in the wild in the near future
VU	Vulnerable	Species considered to be facing a high risk of extinction in the wild in the medium-term future
EX	Extinct Species	Species where ‘there is no reasonable doubt that the last member of the species has died (Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice or the Wildlife Conservation (Rare Flora) Notice)
EW	Extinct in the Wild	Species that are known to only survive in cultivation, in captivity, or as a naturalised population well outside its past range; and it has not been recorded in its known or expected habitat at appropriate seasons anywhere in its past range, despite surveys over a timeframe appropriate to its life cycle and form
MI	Migratory Species	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth (Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice)
CD	Conservation Dependent	Species of special conservation interest (conservation dependent fauna), being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened (Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice)
OS	Specially Protected	Fauna otherwise in need of special protection to ensure their conservation (Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice)
P	Priority Species	Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or


Conservation Code	Name	Description
		flora. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.
P1	Priority One	Poorly known species – Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either very small or on lands not managed for conservation, such as road verges, urban areas, farmland, active mineral lease and under threat of habitat destruction or degradation.
2	Priority Two	Poorly known species – Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, such as national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves and similar.
3	Priority Three	Poorly known species – Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat
4	Priority Four	Rare or near threatened and other species in need of monitoring.

(Source: Department of Biodiversity, Conservation and Attractions, 2023e)

Commonwealth

Category	Description
Critically Endangered	Species facing an extremely high risk of extinction in the wild in the immediate future
Endangered	Species facing a very high risk of extinction in the wild in the near future
Vulnerable	Species facing a high risk of extinction in the wild in the medium term

Appendix 4: Quadrat Data

Quadrat No.:	1	
Survey Date:	13/09/2016	
Personnel:	SH, TB	
Latitude:	31.71127	
Longitude:	115.73032	
Topography:	Mid-Slope	
Aspect:	SW	
Slope:	3-5 %	
Soil:	Grey Sand	
Gravel:	0 %	
Rock:	0 %	
Leaf Litter:	0 %	
Bare Ground:	7%	
Drainage:	Well	
Condition:	Excellent	

Notes: *Banksia* Low Woodland

Native Species	Cover (%)	Height (m)	Weed Species	Height (m)	Cover (%)
<i>Acacia pulchella</i>	1.5	1.0	* <i>Briza maxima</i>	<0.5	0.1
<i>Anigozanthos humilis</i>	0.5	<0.5	* <i>Carpobrotus edulis</i>	<0.5	4
<i>Banksia attenuata</i>	20.0	<10	* <i>Ehrharta longiflora</i>	0.5	0.1
<i>Burchardia congesta</i>	0.1	<0.5	* <i>Gladiolus caryophyllaceus</i>	0.5	0.1
<i>Caladenia flava</i>	1	<0.5	* <i>Heliophila pusilla</i>	<0.5	0.1
<i>Conostylis aculeata</i>	0.5	<0.5	* <i>Hypochaeris glabra</i>	<0.5	3.0
<i>Drosera menziesii</i>	0.5	<0.5	* <i>Lythrum hyssopifolia</i>	<0.5	0.1
<i>Eryngium pinnatifidum</i>	1	<0.5	* <i>Trifolium campestre</i>	<0.5	1
<i>Haemodorum sp.</i>	0.5	<0.5	* <i>Ursinia anthemoides</i>	<0.5	3.0
<i>Hakea lissocarpha</i>	0.1	1			
<i>Hibbertia hypericoides</i>	10.0	1.0			
<i>Isotropis cuneifolia</i>	0.5	<0.5			
<i>Lagenophora huegelii</i>	0.5	<0.5			
<i>Leucopogon propinquus</i>	1	<0.5			

Native Species	Cover (%)	Height (m)	Weed Species	Height (m)	Cover (%)
<i>Lomandra caespitosa</i>	0.1	<0.5			
<i>Lomandra hermaphrodita</i>	0.1	<0.5			
<i>Melaleuca systema</i>	1.0	1.0			
<i>Mesomelaena pseudostygia</i>	8.0	<0.5			
<i>Opercularia vaginata</i>	0.1	<0.5			
<i>Podotheca gnaphalioides</i>	2	<0.5			
<i>Schoenus clandestinus</i>	0.1	<0.5			
<i>Sowerbaea laxiflora</i>	0.5	<0.5			
<i>Thysanotus manglesianus</i>	0.1	0.5			
<i>Trachymene pilosa</i>	0.1	<0.5			
<i>Xanthorrhoea preissii</i>	2.0	2.0			

Note: *denotes introduced species.

Quadrat No.: 2

Survey Date: 13/09/2016
 Personnel: SH, TB
 Latitude: -31.70184
 Longitude: 115.72407
 Topography: Mid-Slope
 Aspect: SE
 Slope: 1-3 %
 Soil: Brown Sand
 Gravel: 0 %
 Rock: 0 %
 Leaf Litter: 0 %
 Bare Ground: 8%
 Drainage: Well
 Condition: Very Good



Notes: *Banksia* Low Woodland

Native Species	Cover (%)	Height (m)	Weed Species	Height (m)	Cover (%)
<i>Acacia pulchella</i>	0.5	0.5	* <i>Brassica tournefortii</i>	<0.5	0.1
<i>Acanthocarpus preissii</i>	0.5	<0.5	* <i>Carpobrotus edulis</i>	1.0	2.0
<i>Alexgeorgea nitens</i>	0.1	<0.5	* <i>Crassula alata</i>	<0.5	0.1
<i>Banksia attenuata</i>	30.0	<10	* <i>Ehrharta longiflora</i>	<0.5	7
<i>Banksia menziesii</i>	5.0	<10	* <i>Hypochaeris glabra</i>	<0.5	0.1
<i>Caladenia flava</i>	0.1	<0.5	* <i>Lysimachia arvensis</i>	<0.5	0.5
<i>Caladenia longicauda</i>	0.1	<0.5	* <i>Moraea flaccida</i>	<0.5	1.0
<i>Conostylis aculeata</i>	0.1	<0.5	* <i>Trifolium campestre</i>	<0.5	0.5
<i>Dianella revoluta</i>	0.1	1.0	* <i>Urospermum picroides</i>	<0.5	0.1
<i>Drosera erythrorhiza</i>	1.5	<0.5	* <i>Ursinia anthemoides</i>	<0.5	0.5
<i>Drosera menziesii</i>	0.1	<0.5	* <i>Wahlenbergia capensis</i>	<0.5	0.1
<i>Hibbertia hypericoides</i>	12.0	<0.5			
<i>Lagenophora huegelii</i>	0.5	<0.5			
<i>Leucopogon propinquus</i>	0.5	<0.5			
<i>Macrozamia riedlei</i>	0.5	1.5			
<i>Mesomelaena pseudostygia</i>	10.0	1.0			

Native Species	Cover (%)	Height (m)	Weed Species	Height (m)	Cover (%)
<i>Schoenus clandestinus</i>	0.5	0.5			
<i>Spyridium globulosum</i>	1	1.5			
<i>Xanthorrhoea preissii</i>	3.0	1.5			

Note: *denotes introduced species.

Quadrat No.: 3

Survey Date: 13/09/2016
 Personnel: SH, TB
 Latitude: -31.70176
 Longitude: 115.72303
 Topography: Mid-Slope
 Aspect: S
 Slope: 1-3 %
 Soil: Brown Sand
 Gravel: 0 %
 Rock: 0 %
 Leaf Litter: 0 %
 Bare Ground: 8%
 Drainage: Well
 Condition: Very Good



Notes: *Banksia* Low Woodland

Native Species	Cover (%)	Height (m)	Weed Species	Height (m)	Cover (%)
<i>Acacia rostellifera</i>	5.0	2.0	* <i>Briza maximus</i>	<0.5	0.5
<i>Acacia saligna</i>	2.0	2.5	* <i>Ehrharta calycina</i>	0.5	0.1
<i>Banksia attenuata</i>	2	1.5	* <i>Ehrharta longiflora</i>	<0.5	1
<i>Banksia menziesii</i>	15.0	3-10	* <i>Gladiolus caryophyllaceus</i>	<0.5	0.1
<i>Burchardia congesta</i>	0.1	<0.5	* <i>Lolium rigidum</i>	<0.5	0.1
<i>Caladenia flava</i>	0.1	<0.5	* <i>Lysimachia arvensis</i>	<0.5	0.1
<i>Caladenia latifolia</i>	0.1	<0.5	* <i>Lythrum hyssopifolia</i>	<0.5	0.1
<i>Caladenia longicauda</i>	0.1	<0.5	* <i>Urospermum picroides</i>	<0.5	0.1
<i>Conostylis aculeata</i>	0.1	<0.5	* <i>Ursinia anthemoides</i>	<0.5	0.1
<i>Conostylis setigera</i>	0.1	<0.5			
<i>Drosera erythrorhiza</i>	0.1	<0.5			
<i>Drosera menziesii</i>	0.1	0.5			
<i>Hakea lissocarpha</i>	1	0.5			
<i>Hibbertia hypneoides</i>	3	1.0			
<i>Isotropis cuneifolius</i>	0.1	<0.5			
<i>Lepidosperma pubisquameum</i>	0.5	<0.5			

Native Species	Cover (%)	Height (m)	Weed Species	Height (m)	Cover (%)
<i>Leucopogon propinquus</i>	0.5	<0.5			
<i>Lomandra hermaphrodita</i>	0.5	<0.5			
<i>Mesomelaena pseudostygia</i>	35.0	<0.5			
<i>Podotheca gnaphalioides</i>	0.1	<0.5			
<i>Schoenus clandestinus</i>	0.5	<0.5			
<i>Sowerbaea laxiflora</i>	0.5	<0.5			
<i>Spyridium globulosum</i>	0.5	0.5			
<i>Thysanotus manglesianus</i>	0.5	<0.5			
<i>Trachymene pilosa</i>	0.5	<0.5			
<i>Xanthorrhoea preissii</i>	7.0	1.5			

Note: *denotes introduced species.

Quadrat No.:	4
Survey Date:	05/07/2024
Personnel:	LC, BD
Easting:	379008.449
Northing:	6491877.478
Topography:	Slight Slope
Aspect:	South
Slope:	0.5 %
Soil:	Yellow Sand
Gravel:	0 %
Rock:	0 %
Leaf Litter:	13 %
Bare Ground:	12 %
Drainage:	Well
Condition:	Excellent



Notes: *Banksia attenuata* and *B. menziesii* woodland over *Xanthorrhoea preissii* and *Hibbertia hypericoides* open shrubland and *Mesomelaena pseudostygia* sparse rushland.

Native Species	Cover (%)	Height (m)	Weed Species	Height (m)	Cover (%)
<i>Acacia pulchella</i>	2.00	1.00	* <i>Briza maxima</i>	0.30	0.10
<i>Acacia saligna</i>	3.00	2.50	* <i>Carpobrotus edulis</i>	2.00	0.15
<i>Banksia attenuata</i>	30.00	5.50	* <i>Ehrharta longiflora</i>	1.00	0.10
<i>Banksia menziesii</i>	13.00	4.50	* <i>Gladiolus caryophyllaceus</i>	0.01	0.10
<i>Burchardia congesta</i>	0.01	0.01	* <i>Lysimachia arvensis</i>	0.10	0.01
<i>Caladenia sp. 2</i>	0.05	0.10	* <i>Medicago polymorpha</i>	0.20	0.01
<i>Conostylis sp.</i>	0.01	0.10	* <i>Moraea flaccida</i>	0.10	0.30
<i>Conostylis teretifolia</i>	0.05	0.10	* <i>Ursinia anthemoides</i>	0.10	0.01
<i>Cyrtostylis huegelii</i>	0.20	0.01			
<i>Desmocladius asper</i>	0.10	0.10			
<i>Drosera erythrorhiza</i>	0.30	0.01			
<i>Drosera micrantha</i>	0.01	0.01			
<i>Drosera pallida</i>	0.01	0.01			
<i>Hakea lissocarpha</i>	1.00	0.40			
<i>Hibbertia hypericoides</i>	20.00	0.50			

Mindarie Regional Council
Infiltration Pond Revegetation Plan – Tamala Park

Native Species	Cover (%)	Height (m)	Weed Species	Height (m)	Cover (%)
<i>Isolepis sp.</i>	0.05	0.05			
<i>Isopogon dubious</i>	0.50	0.30			
<i>Lagenophora sp.</i>	0.10	0.05			
<i>Lepidosperma sp.</i>	0.05	0.30			
<i>Lobelia tenuior</i>	0.05	0.10			
<i>Lomandra maritima</i>	0.01	0.10			
<i>Melaleuca systema</i>	5.50	1.00			
<i>Mesomelaena pseudostygia</i>	8.00	0.40			
<i>Pyrorchis nigricans</i>	0.30	0.01			
<i>Schoenus caespitius</i>	0.05	0.01			
<i>Spyridium globulosum</i>	2.50	1.00			
<i>Styphelia propinqua</i>	0.50	0.20			
<i>Thysanotus manglesianus</i>	0.10	0.20			
<i>Xanthorrhoea gracilis</i>	0.50	0.60			
<i>Xanthorrhoea preissii</i>	20.00	1.70			

Note: *denotes introduced species.

Appendix 5: Example Monitoring Recording Sheets

General Site Information

Site:

Date:

Assessors:

Weather Conditions:

Fauna sighted (list)

Maintenance issues present?

Describe

Potential success inhibiting factors present?

Describe

General Comments

Photo Monitoring

Photo Point	Location description	GPS location	Photo ID

