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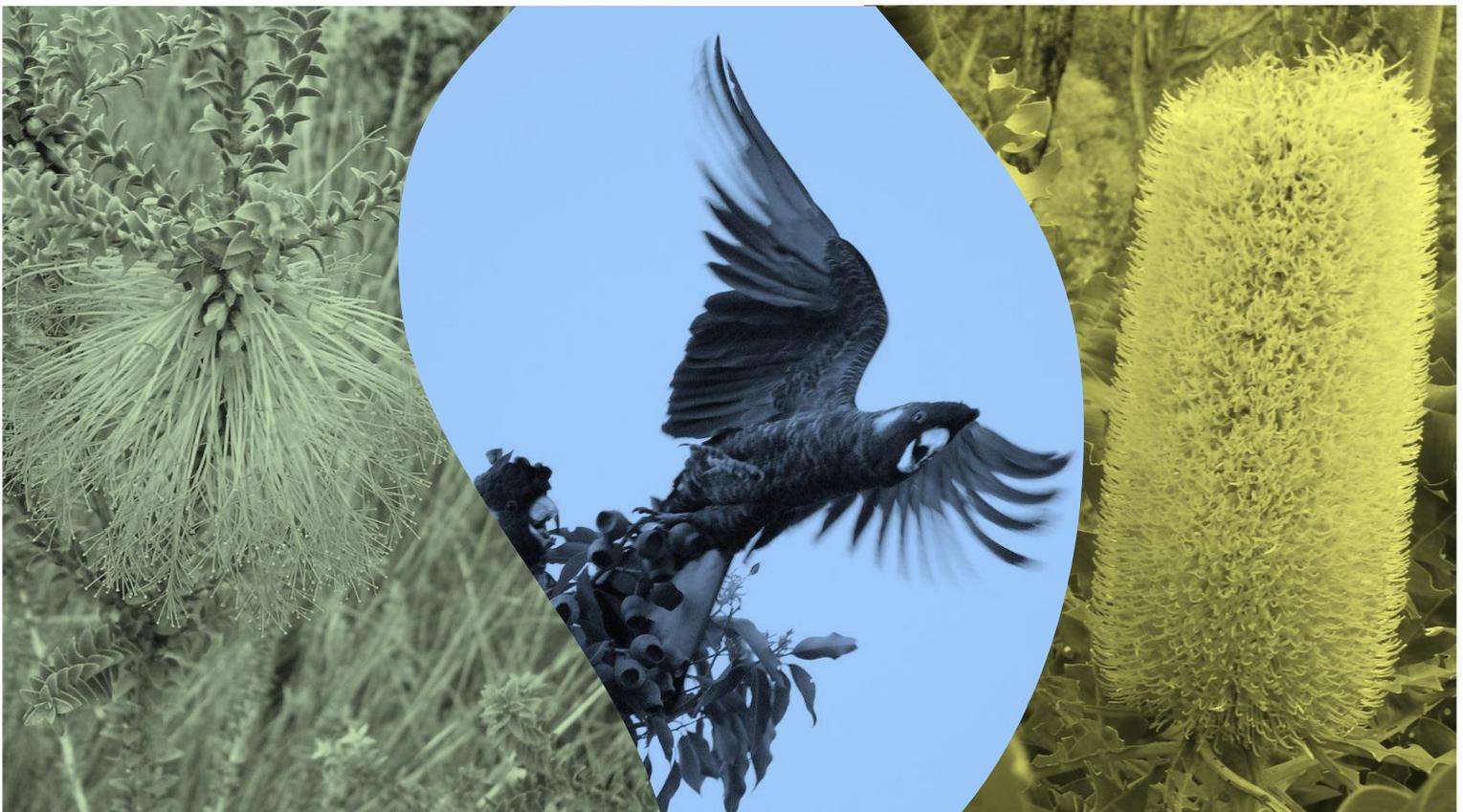
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# Flora Significance Assessment

Lot 304 Sunday Island Bay, Dirk Hartog Island

20 May 2020

Prepared for:  
DHI Developments Pty Ltd



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# Document Control

DHI Developments Pty Ltd

Lot 304 Sunday Island Bay, Dirk Hartog Island

Version	Revision	Purpose	Author	Reviewer	Submitted	
					Form	Date
Report	Rev A	Initial Report	KP	GM	Electronic (email)	19/11/2019
Report	Rev B	Update LDP	DC	GM	Electronic (email)	20/05/2020

Filename: z:\projects\19771 lot 304, sunday bay, dirk hartog island bmp beep flora\reports\structure plan lot 304 sunday island bay flora significance assessment report rev b.docx

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# 1 Introduction

Ecosystem Solutions Pty Ltd were contracted by DHI Developments Pty Ltd to survey Lot 304 Sunday Island Bay, Dirk Hartog Island (hereafter called the “Site”) within the Shire of Shark Bay, to document the presence and distribution of flora as part of the application for a proposed Local Development Plan.

The flora elements specifically targeted includes Threatened and Priority species and Threatened or Priority Ecological Communities. The flora assessment was limited to observing the species present during the time of the surveys.

## 2 Site Details

The Site is located to the south east of Dirk Hartog Island, approximately 40 km to the south west of Denham. The Site is approximately 11 ha in size, within the Shire of Shark Bay (Figure 1). A Local Development Plan has been prepared, which includes 33 development envelopes that can include up to 33 Visitor Accommodation Units.

The Site is currently vacant land, consisting of naturally occurring coastal vegetation. The Site peaks at approximately 20 m AHD (Australian Height Datum), with the dunes undulating down to 5m AHD within the Site.

The surrounding area consists of extensive areas of remnant vegetation within the Dirk Hartog National Park, with the ocean directly to the south and east of the Site.

### Local Development Plan Provisions

This Local Development Plan (LDP) has been prepared in accordance with Part 6 Schedule 2 of the Deemed Provisions of the Planning and Development (Local Planning Schemes) Regulations 2015. Lot 304 Sunday Island Bay is zoned Special Use No. 14 (SU14) under the Shire of Shark Bay Local Planning Scheme No. 4 and specific conditions apply to any future development. The objectives of the SU14 zone is to provide for ecotourism development. The LDP should be read with the relevant technical documents and management plans referred to in the LDP provisions.

The following provisions apply to guide development.

#### 1 BUILDING ENVELOPES

- Development shall be contained within the building envelopes as shown on the LDP, unless approved by the local government.
- All ancillary development including water tanks, car parking, servicing infrastructure, outbuildings and effluent disposal systems are to be sited having regard for the following:
  - Outbuildings are encouraged to be located so as to not obstruct the coastal aspect or views from habitable development and to minimise the visual impact as viewed from the ocean side of Lot 304;
  - Soil suitability/capability for effluent disposal (refer LDP provision 7.1);
  - Minimising removal of remnant vegetation;
  - Bushfire management;
  - Coastal hazard risks (refer to Coastal Risk Management Plan Notes); and
  - Any other practical considerations such as topography.

1.3 The local government may require an updated flora report or vegetation information for any clearing outside of a building envelope.

1.4 Where there is a conflict between the number of envelopes shown on the LDP and any written LDP provision, the written provision shall prevail.

#### 2 SITING AND SETBACK REQUIREMENTS

- All buildings and structures shall be setback a minimum of:
  - 11 metres from the Lot 304 cadastral boundaries in compliance with any Bushfire Management Plan and / or BAL assessment approved by the local government; or
  - in accordance with the Asset Protection Zone setbacks to classified vegetation specified in any Bushfire Management Plan and / or BAL Assessment approved by the local government.
- No building envelopes fall within the coastal erosion hazard setback line to 2070, as illustrated on the LDP, but will require coastal risk management (refer to Coastal Risk Management Plan Notes).
- Buildings shall be setback a minimum of 2 metres from access routes.

#### 3 BUSHFIRE MANAGEMENT

- Proposed development shall demonstrate compliance with any Bushfire Management Plan and / or BAL Assessment approved by the local government.
- The developer(s) / landowner(s) shall be responsible for the implementation and management of any Bushfire Management Plan and / or BAL Assessment approved by the local government so as to ensure that development is able to occur in the intended manner. All BAL ratings identified in the Bushfire Management Plan are indicative and are required to be verified at the time of construction of individual buildings to ensure appropriate setbacks identified have been achieved.
- Vegetation (existing or proposed) and Asset Protection Zones in Lot 304 shall be managed and maintained as 'low threat vegetation' in accordance with any Bushfire Management Plan and / or BAL Assessment approved by the local government.
- The strategic firebreak will allow people to access the periphery of Lot 304 and provide access to the foreshore.

#### 4 BUILT FORM

4.1 Design Guidelines have been prepared and form part of this LDP. Development is to have regard to and address the Design Guidelines.

#### 5 BUILDING HEIGHT

- Inundation hazard is to be managed through avoidance, with minimum floor levels for habitable development to be not less than 4.2m AHD. Non-habitable development with finished floor levels less than 4.2m AHD may be considered by the local government for ancillary development that is detached from habitable development and can be easily relocated (refer to Coastal Risk Management Plan Notes).
- New buildings and outbuildings to be low scale consistent with the Scheme. The local government may require a Visual Impact Assessment in accordance with condition 11 of the SU14 zone.
- Buildings raised more than 1.0m above the minimum floor level, and/or buildings proposed as two-storeys may be approved by the local government where it can be demonstrated that the bulk and scale of the building takes into account topography, natural landscape and coastal amenity of the location.

#### 6 VEGETATION AND LANDSCAPING

6.1 No introduced non-native species shall be planted on the lot. Revegetation shall not occur in conflict with the recommendations of any Bushfire Management Plan approved by the local government. The landowner(s) shall be guided by the Dirk Hartog Biosecurity Implementation Plan 2015.

#### 7 SERVICE INFRASTRUCTURE

- Development application(s) to provide details of effluent disposal in accordance with the Government Sewerage Policy 2019 and having regard to the Site and Soil Assessment Evaluation for Lot 304 Sunday Island Bay.
- Development application(s) shall demonstrate servicing of building envelopes and development thereon with water supply (potable and firefighting 10,000L tanks) and electricity (including generation), to the satisfaction of the local government.

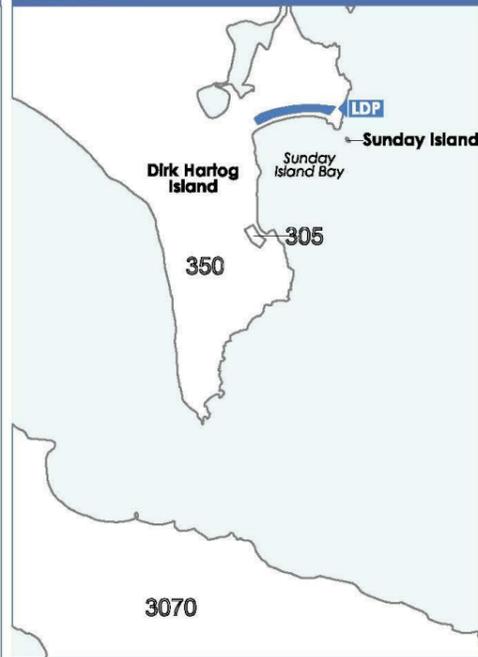
#### 8 MANAGEMENT

- Temporary sea containers and structures associated with construction may be in place for a maximum period of 12-months, or longer period approved by the local government, and thereafter removed from the island at the developer(s) / landowner(s) cost.
- A management plan has been prepared and forms part of this LDP.

#### 9 ADVICE NOTES

- Regarding section 1 building envelopes, Lot 304 is subject to covenants to the benefit of the Minister of Lands and should be referred to by proponents. In particular the covenants provide details in relation to (amongst other things):
  - The number of "visitor accommodation units" that may be built or placed on the land, and the floor area of each "visitor accommodation unit"; and
  - The "staff accommodation" and the ratio of staff-to-guests and floor area per staff personnel being housed.
- Regarding section 1 building envelopes, the number of building envelopes shown on the LDP is nominal and not all of the building envelopes may be able to be built on. The number of building envelopes depicted on this LDP may be amended, subject to approval by the local government.
- Regarding section 3 Bushfire Management, Lot 304 is in a designated bushfire prone area. Landowners will educate and inform all guests of the increased risks associated with bushfire when staying on a remote tourism/ holiday accommodation development.

### Location Plan



### Legend

- Lot 304
- Building Envelope
- Easement
- Access Track (notional 6m wide)
- 11m setback to cadastral boundary (fire)
- Strategic Firebreak
- Coastal Access Point - Indicative connections for construction. Pedestrian access having regard to recommendations in Damara WA 2019 and approval by DBCA.
- +2m AHD contour
- +4m AHD contour
- Coastal Erosion Hazard Setback to 2070 (Schedule One SPP2.6)

### Coastal Risk Management Plan

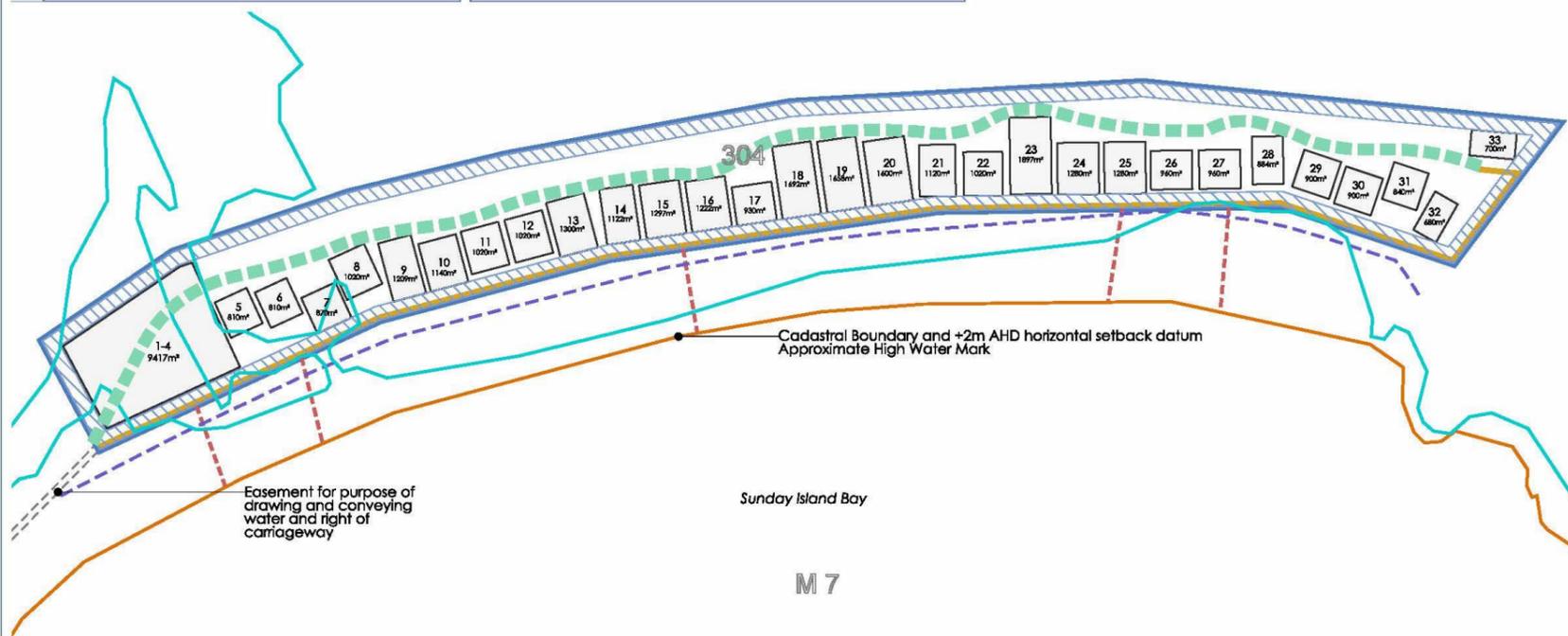
- Inundation risk is managed through avoidance, with all buildings on land >4.2m AHD.
- Erosion risk management is focused on beach access and dune management, with a longer-term consideration of managed retreat. Erosion risk management should follow the monitoring and management outlined in the revised Coastal Risk Management Plan (CRMP) (Damara 2019).
- Beach access and dune management: Triggers for management action when there is >50m existing buffer to buildings include:
  - scarps >0.5m vertically in the beach access paths;
  - foredune scarping sustained with <5m of dune retreat;
  - dune deflation identified;
  - blowout formation;
  - additional beach tracks formed.
 Relevant management actions should be undertaken as outlined in Table 2 of CRMP including additional triggers for when 40-50m buffer remains.
- Managed retreat: Strategy of planned retreat should follow Section 1b of CRMP. A detailed management retreat plan will be submitted to the local government within six (6) months of the trigger of 40m remaining buffer between the +2m AHD contour, and buildings. Managed retreat may be planned for small groups of buildings while others are maintained with a >40m buffer. Retreat should be undertaken when remaining buffer is 30m. Each co-owner of Lot 304 will be responsible for building removal, rehabilitation and revegetation of the site where buildings are relocated. Any land rehabilitated following managed retreat shall not conflict with a Bushfire Management Plan and will not be ceded to the local government, and will require ongoing management.

### Endorsement Table

This Local Development Plan has been approved by the Shire of Shark Bay Council at its Ordinary Meeting held on the \_\_\_\_\_ in accordance with Clause 52(1) of the Planning and Development (Local Planning Schemes) Regulations 2015.

Chief Executive Officer: \_\_\_\_\_

Date: \_\_\_\_\_



**LOCAL DEVELOPMENT PLAN**  
 Lot 304 Sunday Island Bay, Dirk Hartog Island  
 A DHI Developments Pty Ltd Project

Scale: 1:4000@A3  
 Date: 18 May 2020  
 Project: 19/061/003M

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Figure 1 Proposed Local Development Plan for Lot 304 Sunday Island Bay, Dirk Hartog Island

# 3 Flora and Vegetation

## 3.1 Desktop Analysis

### 3.1.1 Landscape, Soils and Vegetation

Soil-Landscape systems are areas with recurring patterns of landforms, soils and vegetation and are used by the Department of Agriculture to maintain a consistent approach to land resource surveys.

The Site is located within the Shark Bay Soil-Landscape Zone which consists of partly dissected calccrete-duricrusted plateau, undulating limestone plains, undulating sandplain and coastal dunes (Figure 2). These soils are further classified as soil systems (DPIRD, 2019).

The Edel System represents the soils of the Site, these are undulating sandy plains with occasional dunes, limestone rises and saline flats supporting acacia shrublands with some saltbush and heath communities (DPIRD, 2019).

The vegetation mapping available is of original natural vegetation presumed to have existed prior to European settlement in Western Australia. The major sources of data is at 1:250,000 scale and is based on the published and unpublished mapping of J.S. Beard. The following vegetation type has been identified within the Site:

- Spinifex complexes (41) - Hummock grassland with scattered low trees over dwarf shrubs or mixed short grass and spinifex mixed species, *Triodia* spp.

### 3.1.2 Threatened and Priority Flora

Extracts from the Department of Biodiversity, Conservation and Attractions (DBCA) NatureMap Database over a 50 km radius of the site (Appendix A) and the Commonwealth Environmental Protection and Biodiversity Conservation (EPBC) Protected Matters Search Tool over the same distance (Appendix B) were obtained to determine if records of any rare or threatened flora are known within the boundary or in vicinity of the Site. A preliminary reconnaissance survey of the results of the desktop study was conducted, consistent with a Reconnaissance Survey Flora and Vegetation Survey (EPA, 2016).

Species of flora and fauna are protected as defined in Appendix C, with it being determined that their populations are restricted geographically or threatened by local processes. DBCA recognizes these threats of extinction and consequently applies regulations towards population and species protection. Protected species are gazetted under the *Biodiversity Conservation Act (2016)* and therefore it is an offence to “take” or damage rare flora without Ministerial approval. The act defines “to take” as “... to gather, pick, cut, pull up, destroy, dig up, remove or injure the flora or to cause or permit the same to be done by any means” (Government of Western Australia, 2010).

Appendix C presents the definitions for conservation codes under the *Biodiversity Conservation Act (2016)* which was previously the *Wildlife Conservation Act 1950*.

### 3.1.3 Threatened and Priority Ecological Communities

An ecological community is a naturally occurring biological assemblage that occurs in a particular habitat. A Threatened Ecological Community (TEC) is one which is found to fit into one of the following categories: Presumed Totally Destroyed; Critically Endangered; Endangered, or Vulnerable.

Possible TECs that do not meet survey criteria are added to the Department of Parks and Wildlife’s Priority Ecological Community Lists, under Priority 1, 2 and 3. These are ranked in order of priority for survey and/or the definition of the community and evaluation of its conservation status.

## 3.2 Targeted Survey

The site survey was undertaken on the 4<sup>th</sup> and 5<sup>th</sup> September by Gary McMahon (B.Sc. M. Env. Mgmt., C.EnvP, FB62000143).

The Site was walked in a systematic manner to cover the entire area, focusing on the proposed areas of disturbance. Vegetation structure and composition were noted and the main species in each of the strata were identified and recorded through relevés (Appendix D). The locations of the relevés recorded across the site are shown in Figure 2 below, with the data sheets in Appendix D. All potentially suitable habitats within the Site were systematically searched for significant flora or

vegetation, with specific targets being based on the Department of Biodiversity Conservation and Attractions database records.

## 3.3 Results

### 3.3.1 Species

The NatureMap Database (DBCA - Appendix A) identified five Priority species that have been recorded within 5 km of the Site (Table 1). The Protected Matters Search Tool (PMST, DoEE - Appendix B) did not identify any Threatened flora species or species habitat as occurring or likely to occur within the area. There are no historical records of Declared Rare Flora species on Dirk Hartog Island (NatureMap Database, accessed 29 October 2019).

*Table 1: Conservation Significant Flora Likely to Occur Within 5 km of the Site (NatureMap)*

SPECIES	LIFEFORM	HABITAT	DCBA CONSERVATION CODE	EPBC ACT STATUS
<i>Lepidium biplicatum</i>	Shrub	Coastal regions	P3	N/A
<i>Lepidium puberulum</i>	Herb	Sandy soils	P4	N/A
<i>Melaleuca huegelii</i> subsp. <i>pristicensis</i>	Shrub or tree	Sand	P3	N/A
<i>Triodia bromoides</i>	Tussock forming perennial	Red, grey and calcareous sand. Dunes, sandplains, stony rises.	P4	N/A
<i>Triodia plurinervata</i>	Tussock forming perennial	Red to orange-brown sand, limestone, sandy loam. Sand dunes and steppes, often coastal areas, drainage basins, salt lakes.	P3	N/A

The targeted survey did not detect any Declared Rare Flora or Priority listed flora within the Site.

### 3.3.2 Vegetation Communities

Overall the vegetation within the site is relatively consistent in both species and structure, with densities varying depending on slight topographical variances (note these are not significant and more described as small gulleys or depressions within the coastal areas). Revele data (Appendix D) can be aggregated to describe the vegetation (described according to Keighery, 1994, adapted Muir (1977) and Aplin (1979), Table 2 below) as:

Scattered shrubs of *Acacia ligulata*, over Open Heath in some areas of *Diplolaena grandiflora* and *Acacia ligulata*, over Low Closed Heath of *Thryptomene dampieri*, *Frankenia pauciflora*, *Acacia ligulata*, *Atriplex bunburyana* and *Atriplex vesicaria*. Other common species included *Senecio pinnatifolius*, *Acanthocarpus preissii* and *Spinifex longifolius* as well as numerous Poaceae weed species (Introduced Grasses).

While the Beard's classification structure description is vague and at a higher scale, the above description is consistent with that described broadly by Beard (i.e. Spinifex complexes (41))

Table 2: Structural Classification of Vegetation (Keighery 1994, Adapted from Muir 1977 and Aplin, 1979)

Stratum	Canopy Cover									
	70%-100%		30%-70%		10%-30%		2%-10%		<2%	
Trees > 30m	Tall Closed Forest	Tall Open Forest	Tall Woodland	Tall Open Woodland	Scattered Tall Trees					
Trees 10-30m	Closed Forest	Open Forest	Woodland	Open Woodland	Scattered Trees					
Trees < 10m	Low Closed Forest	Low Open Forest	Low Woodland	Low Open Woodland	Scattered Low Trees					
Shrubs >2m	Tall Closed Scrub	Tall Open Scrub	Tall Shrubland	Tall Open Shrubland	Scattered Tall Shrubs					
Shrubs 1-2m	Closed Heath	Open Heath	Shrubland	Open Shrubland	Scattered Shrubs					
Shrubs <1m	Low Closed Heath	Low Open Heath	Low Shrubland	Low Open Shrubland	Scattered Low Shrubs					
Hummock Grasses	Closed Hummock Grassland	Mid-Dense Hummock Grasslands	Hummock Grassland	Open Hummock Grassland	Scattered Hummock Grassland					
Grasses, Sedges & Herbs	Closed Tussock Grassland/ Sedgeland/ Herbland	Tussock Grassland/ Sedgeland/ Herbland	Open Tussock Grassland/ Sedgeland/ Herbland	Very Open Tussock Grassland/ Sedgeland/ Herbland	Scattered Tussock Grassland/ Sedgeland/ Herbland					

### 3.3.3 Vegetation Condition

Utilising the scale of condition developed by Keighery (1994, Table 3), the areas of vegetation were classed as Good as there are signs of significant alteration to the vegetation structure and densities due to extensive evidence of past grazing. The basic vegetation structure remains and there is the ability for it to regenerate. The areas of tracks have been ranked as Completely Degraded.

Table 3: Keighery Condition Scale (Keighery 1994)

Category	Description
<b>Pristine</b>	Pristine or nearly so, no obvious signs of destruction.
<b>Excellent</b>	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. For example, damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle track.
<b>Very Good</b>	Vegetation structure altered, No obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
<b>Good</b>	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate to it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
<b>Degraded</b>	Basic vegetation structure severely impacted by disturbance. Scope for regeneration, but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
<b>Completely Degraded</b>	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 composing weed or crop species with isolated native trees or shrubs.



Location details: Lot 403 Sunday Island Bay, Dirk Hartog  
 Project: 19771  
 Assessment date: 04/09/2019 & 05/09/2019  
 Prepared by: K Paterson

**Relevé Locations**



**Legend**

- The Site
- Proposed Development Envelopes
- Relevé



Figure 2 Relevé Locations at Lot 304 Sunday Island Bay, Dirk Hartog Island

## 4 Survey Constraints

The targeted survey was conducted across two days, with the Site was traversed by foot in a systematic way to cover the entire area.

There are constraints in monitoring flora which include some annual species that do not appear every season, with the survey limited to identifying only those flora that are present during the survey times.

## 5 Significance

Under the EPBC Act, an action that has, will have, or is likely to have, a significant impact on a matter of national environmental significance, requires approval from the Minister. A significant impact is defined as an impact which is important or of consequence, having regard for its context or intensity (Commonwealth of Australia, 2009).

Matters of environmental significance are:

- Listed threatened species and ecological communities
- Migratory species protected under international agreements
- Ramsar wetlands of international importance
- The Commonwealth marine environment
- World Heritage properties
- National Heritage places
- Great Barrier Reef Marine Park, and
- Nuclear actions.

For this development, there are no identified matters of environmental significance. There is a minimal potential for impact on conservation significant flora species due to their absence from the Site and proposed areas of impact required for this development.

## 6 Summary and Recommendations

Based on the results of the analysis of Site, the following conclusions and recommendations are made.

- There were no Declared Rare Flora or Priority listed flora observed in the Site.

Given there were no signs of any Declared Rare Flora within the Site, and no historical records of Declared Rare Flora on Dirk Hartog Island, a referral under the EPBC Act is not considered to be required as any proposed actions are unlikely to significantly impact upon any threatened flora species.

## 7 References (not all cited)

Aplin, T.E.H. 1977 The Flora. *Environment and Science*. (Ed. B.J. O'Brien) (University of Western Australia Press, Perth).

Environmental Protection Authority (2016). Technical Guidance: Flora and Vegetation Surveys for *Environmental Impact Assessment in Western Australia*. EPA December 2016.

Keighery, B. J. (1994). *Bushland Plant Survey: A guide to plant community survey for the community*. Wildflower Society of Western Australia (Inc.), Nedlands.

## Appendix A NatureMap Extract

# NatureMap Species Report

Created By Guest user on 20/05/2020

<b>Kingdom</b>	Plantae
<b>Conservation Status</b>	Conservation Taxon (T, X, IA, S, P1-P5)
<b>Current Names Only</b>	Yes
<b>Core Datasets Only</b>	Yes
<b>Method</b>	'By Circle'
<b>Centre</b>	113° 13' 43" E, 26° 07' 15" S
<b>Buffer</b>	40km

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
1.	14112 <i>Abutilon</i> sp. <i>Hamelin</i> (A.M. Ashby 2196)		P2	
2.	14114 <i>Abutilon</i> sp. <i>Quobba</i> (H. Demarz 3858)		P2	
3.	13077 <i>Acacia sclerosperma</i> subsp. <i>glaucescens</i>		P3	
4.	1207 <i>Acanthocarpus parviflorus</i>		P3	
5.	1210 <i>Acanthocarpus rupestris</i>		P2	
6.	7830 <i>Angianthus microcephalus</i> ( <i>Small-headed Angianthus</i> )		P2	
7.	6948 <i>Anthocercis intricata</i>		P3	
8.	19520 <i>Boronia crenulata</i> subsp. <i>Shark Bay</i> (G. Cockerton 5187)		P1	
9.	30232 <i>Bossiaea calcicola</i>		P3	
10.	48659 <i>Calandrinia</i> sp. <i>Edel Land</i> (F. Obbens FO 01/17)		P2	
11.	18359 <i>Carpobrotus</i> sp. <i>Thevenard Island</i> (M. White 050)		P3	
12.	12616 <i>Chthonocephalus muellerianus</i>		P2	
13.	18132 <i>Dicrastylis</i> sp. <i>Denham</i> (M. Lewis 42/92)		P1	Y
14.	14196 <i>Eremophila cuneata</i>		P1	
15.	17151 <i>Eremophila splendens</i>		P1	Y
16.	2083 <i>Grevillea rogersoniana</i> ( <i>Rogersons' Grevillea</i> )		P3	
17.	19192 <i>Grevillea</i> sp. <i>Shark Bay</i> (N.H. Speck 24/09/1953)		P1	Y
18.	3020 <i>Lepidium biplicatum</i>		P3	
19.	3043 <i>Lepidium puberulum</i>		P4	
20.	13270 <i>Melaleuca huegelii</i> subsp. <i>pristicensis</i>		P3	
21.	5945 <i>Melaleuca oldfieldii</i>		P2	
22.	12639 <i>Olearia occidentissima</i>		P2	
23.	4677 <i>Phyllanthus fuerrohrlii</i> ( <i>Sand Sponge</i> )		P3	
24.	17208 <i>Physopsis chrysophylla</i>		P3	
25.	2692 <i>Ptilotus alexandri</i>		P2	
26.	18111 <i>Spergularia nesophila</i>		P3	
27.	14241 <i>Stenanthemum divaricatum</i>		P3	
28.	44701 <i>Thryptomene repens</i>		P2	Y
29.	17885 <i>Triodia bromoides</i>		P4	
30.	694 <i>Triodia plurinervata</i>		P3	
31.	12417 <i>Verticordia dichroma</i> var. <i>syntoma</i>		P3	

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

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

# Appendix B EPBC Act Protected Matters Report



## EPBC Act Protected Matters Report

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

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

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 20/05/20 13:33:47

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[Acknowledgements](#)



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[Coordinates](#)

Buffer: 50.0Km



## Summary

### Matters of National Environmental Significance

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

<a href="#">World Heritage Properties:</a>	1
<a href="#">National Heritage Places:</a>	1
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	1
<a href="#">Listed Threatened Ecological Communities:</a>	None
<a href="#">Listed Threatened Species:</a>	41
<a href="#">Listed Migratory Species:</a>	60

### Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	87
<a href="#">Whales and Other Cetaceans:</a>	24
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

### Extra Information

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

<a href="#">State and Territory Reserves:</a>	4
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	10
<a href="#">Nationally Important Wetlands:</a>	1
<a href="#">Key Ecological Features (Marine)</a>	None

## Details

### Matters of National Environmental Significance

#### World Heritage Properties [\[ Resource Information \]](#)

Name	State	Status
<a href="#">Shark Bay, Western Australia</a>	WA	Declared property

#### National Heritage Properties [\[ Resource Information \]](#)

Name	State	Status
Natural		
<a href="#">Shark Bay, Western Australia</a>	WA	Listed place

#### 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 the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name
EEZ and Territorial Sea

#### Marine Regions [\[ Resource Information \]](#)

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name
<a href="#">North-west</a>

#### Listed Threatened Species [\[ Resource Information \]](#)

Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Anous tenuirostris melanops</a> Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Calidris tenuirostris</a> Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Limosa lapponica baueri</a> Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Limosa lapponica menzbieri</a> Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Malurus leucopterus leucopterus</a> White-winged Fairy-wren (Dirk Hartog Island), Dirk Hartog Black-and-White Fairy-wren [26004]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Pterodroma mollis</a> Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Breeding known to occur within area
<a href="#">Thalassarche carteri</a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
<a href="#">Thalassarche cauta cauta</a> Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche cauta stedi</a> White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Balaenoptera borealis</a> Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Migration route known to occur within area
<a href="#">Balaenoptera physalus</a> Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Bettongia lesueur lesueur</a> Burrowing Bettong (Shark Bay), Boodie [66659]	Vulnerable	Translocated population

Name	Status	Type of Presence
<a href="#">Bettongia penicillata ogilbyi</a> Woylie [66844]	Endangered	known to occur within area Species or species habitat known to occur within area
<a href="#">Dasyurus geoffroi</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
<a href="#">Leporillus conditor</a> Wopilkara, Greater Stick-nest Rat [137]	Vulnerable	Translocated population known to occur within area
<a href="#">Macrotis lagotis</a> Greater Bilby [282]	Vulnerable	Translocated population known to occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
<b>Plants</b>		
<a href="#">Eucalyptus beardiana</a> Beard's Mallee [18933]	Vulnerable	Species or species habitat may occur within area
<b>Reptiles</b>		
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
<a href="#">Egernia stokesii badia</a> Western Spiny-tailed Skink, Baudin Island Spiny-tailed Skink [64483]	Endangered	Species or species habitat known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
<b>Sharks</b>		
<a href="#">Carcharias taurus (west coast population)</a> Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
<b>Listed Migratory Species</b>		<b>[ Resource Information ]</b>
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardenna carneipes</a> Flesh-footed Shearwater, Fleishy-footed Shearwater [82404]		Species or species habitat likely to occur within area
<a href="#">Ardenna pacifica</a> Wedge-tailed Shearwater [84292]		Breeding known to occur within area
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
<a href="#">Hydroprogne caspia</a> Caspian Tern [808]		Breeding known to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Onychoprion anaethetus</a> Bridled Tern [82845]		Breeding known to occur within area
<a href="#">Sterna dougallii</a> Roseate Tern [817]		Breeding known to occur within area
<a href="#">Thalassarche carteri</a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<b>Migratory Marine Species</b>		
<a href="#">Balaena glacialis australis</a> Southern Right Whale [75529]	Endangered*	Species or species habitat likely to occur within area
<a href="#">Balaenoptera borealis</a> Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Migration route known to occur within area
<a href="#">Balaenoptera physalus</a> Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
<a href="#">Dugong dugon</a> Dugong [28]		Breeding known to occur within area
<a href="#">Isurus oxyrinchus</a> Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
<a href="#">Isurus paucus</a> Longfin Mako [82947]		Species or species habitat likely to occur within area
<a href="#">Lamna nasus</a> Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
<a href="#">Manta alfredi</a> Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat known to occur within area
<a href="#">Manta birostris</a> Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Physeter macrocephalus</a> Sperm Whale [59]		Species or species habitat may occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur

Name	Threatened	Type of Presence within area
<a href="#">Arenaria interpres</a> Ruddy Turnstone [872]		Species or species habitat known to occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
<a href="#">Calidris alba</a> Sanderling [875]		Species or species habitat known to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat known to occur within area
<a href="#">Calidris ruficollis</a> Red-necked Stint [860]		Species or species habitat known to occur within area
<a href="#">Calidris tenuirostris</a> Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Charadrius veredus</a> Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Limosa limosa</a> Black-tailed Godwit [845]		Species or species habitat known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Numenius phaeopus</a> Whimbrel [849]		Species or species habitat known to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Breeding known to occur within area
<a href="#">Pluvialis squatarola</a> Grey Plover [865]		Species or species habitat known to occur within area
<a href="#">Thalasseus bergii</a> Crested Tern [83000]		Breeding known to occur within area
<a href="#">Tringa brevipes</a> Grey-tailed Tattler [851]		Species or species habitat known to occur within area
<a href="#">Tringa glareola</a> Wood Sandpiper [829]		Species or species

Name	Threatened	Type of Presence
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		habitat known to occur within area  Species or species habitat known to occur within area
<a href="#">Xenus cinereus</a> Terek Sandpiper [59300]		Species or species habitat known to occur within area
<b>Other Matters Protected by the EPBC Act</b>		
<b>Listed Marine Species</b>		<a href="#">[ Resource Information ]</a>
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat likely to occur within area
<a href="#">Anous tenuirostris melanops</a> Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat known to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Arenaria interpres</a> Ruddy Turnstone [872]		Species or species habitat known to occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
<a href="#">Calidris alba</a> Sanderling [875]		Species or species habitat known to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat known to occur within area
<a href="#">Calidris ruficollis</a> Red-necked Stint [860]		Species or species habitat known to occur within area
<a href="#">Calidris tenuirostris</a> Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Catharacta skua</a> Great Skua [59472]		Species or species habitat may occur within area
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Charadrius ruficapillus</a> Red-capped Plover [881]		Species or species habitat known to occur within area
<a href="#">Charadrius veredus</a> Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
<a href="#">Chrysococcyx osculans</a> Black-eared Cuckoo [705]		Species or species habitat known to occur within area
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
<a href="#">Heteroscelus brevipes</a> Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
<a href="#">Himantopus himantopus</a> Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area
<a href="#">Larus novaehollandiae</a> Silver Gull [810]		Breeding known to occur within area
<a href="#">Larus pacificus</a> Pacific Gull [811]		Breeding known to occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Limosa limosa</a> Black-tailed Godwit [845]		Species or species habitat known to occur

Name	Threatened	Type of Presence
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Numenius phaeopus</a> Whimbrel [849]		Species or species habitat known to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Breeding known to occur within area
<a href="#">Pluvialis squatarola</a> Grey Plover [865]		Species or species habitat known to occur within area
<a href="#">Pterodroma mollis</a> Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Puffinus carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
<a href="#">Puffinus pacificus</a> Wedge-tailed Shearwater [1027]		Breeding known to occur within area
<a href="#">Recurvirostra novaehollandiae</a> Red-necked Avocet [871]		Species or species habitat known to occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
<a href="#">Sterna anaethetus</a> Bridled Tern [814]		Breeding known to occur within area
<a href="#">Sterna bengalensis</a> Lesser Crested Tern [815]		Breeding known to occur within area
<a href="#">Sterna bergii</a> Crested Tern [816]		Breeding known to occur within area
<a href="#">Sterna caspia</a> Caspian Tern [59467]		Breeding known to occur within area
<a href="#">Sterna dougallii</a> Roseate Tern [817]		Breeding known to occur within area
<a href="#">Sterna fuscata</a> Sooty Tern [794]		Breeding known to occur within area
<a href="#">Sterna nereis</a> Fairy Tern [796]		Breeding known to occur within area

Name	Threatened	Type of Presence
<a href="#">Thalassarche carteri</a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Tringa glareola</a> Wood Sandpiper [829]		Species or species habitat known to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
<a href="#">Xenus cinereus</a> Terek Sandpiper [59300]		Species or species habitat known to occur within area
<b>Fish</b>		
<a href="#">Campichthys galei</a> Gale's Pipefish [66191]		Species or species habitat may occur within area
<a href="#">Choeroichthys suillus</a> Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
<a href="#">Festucalex scalaris</a> Ladder Pipefish [66216]		Species or species habitat may occur within area
<a href="#">Filicampus tigris</a> Tiger Pipefish [66217]		Species or species habitat may occur within area
<a href="#">Halicampus brocki</a> Brock's Pipefish [66219]		Species or species habitat may occur within area
<a href="#">Haliichthys taeniophorus</a> Ribbined Pipehorse, Ribbined Seadragon [66226]		Species or species habitat may occur within area
<a href="#">Hippocampus angustus</a> Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
<a href="#">Hippocampus histrix</a> Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
<a href="#">Hippocampus planifrons</a> Flat-face Seahorse [66238]		Species or species habitat may occur within area
<a href="#">Hippocampus trimaculatus</a> Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Lissocampus fatiloquus</a> Prophet's Pipefish [66250]		Species or species habitat may occur within area
<a href="#">Nannocampus subosseus</a> Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area
<a href="#">Solegnathus lettiensis</a> Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
<a href="#">Solenostomus cyanopterus</a> Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
<a href="#">Stigmatopora argus</a> Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
<a href="#">Syngnathoides biaculeatus</a> Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
<a href="#">Trachyrhamphus bicoarctatus</a> Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Dugong dugon</a> Dugong [28]		Breeding known to occur within area
<b>Reptiles</b>		
<a href="#">Aipysurus laevis</a> Olive Seasnake [1120]		Species or species habitat may occur within area
<a href="#">Aipysurus pooleorum</a> Shark Bay Seasnake [66061]		Species or species habitat may occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
<a href="#">Disteira kingii</a> Spectacled Seasnake [1123]		Species or species habitat may occur within area
<a href="#">Disteira major</a> Olive-headed Seasnake [1124]		Species or species habitat may occur within area
<a href="#">Emydocephalus annulatus</a> Turtle-headed Seasnake [1125]		Species or species habitat may occur within area
<a href="#">Ephalophis greyi</a> North-western Mangrove Seasnake [1127]		Species or species habitat may occur within area
<a href="#">Hydrophis elegans</a> Elegant Seasnake [1104]		Species or species habitat may occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Species or species

Name	Threatened	Type of Presence
<a href="#">Pelamis platurus</a> Yellow-bellied Seasnake [1091]		habitat known to occur within area  Species or species habitat may occur within area
<b>Whales and other Cetaceans</b>		
<b>[ Resource Information ]</b>		
Name	Status	Type of Presence
<b>Mammals</b>		
<a href="#">Balaenoptera acutorostrata</a> Minke Whale [33]		Species or species habitat may occur within area
<a href="#">Balaenoptera borealis</a> Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Migration route known to occur within area
<a href="#">Balaenoptera physalus</a> Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Delphinus delphis</a> Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
<a href="#">Feresa attenuata</a> Pygmy Killer Whale [61]		Species or species habitat may occur within area
<a href="#">Globicephala macrorhynchus</a> Short-finned Pilot Whale [62]		Species or species habitat may occur within area
<a href="#">Grampus griseus</a> Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
<a href="#">Kogia breviceps</a> Pygmy Sperm Whale [57]		Species or species habitat may occur within area
<a href="#">Kogia simus</a> Dwarf Sperm Whale [58]		Species or species habitat may occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Peponocephala electra</a> Melon-headed Whale [47]		Species or species habitat may occur within area
<a href="#">Physeter macrocephalus</a> Sperm Whale [59]		Species or species habitat may occur within area

Name	Status	Type of Presence
<a href="#">Pseudorca crassidens</a> False Killer Whale [48]		Species or species habitat likely to occur within area
<a href="#">Stenella attenuata</a> Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
<a href="#">Stenella coeruleoalba</a> Striped Dolphin, Euphrosyne Dolphin [52]		Species or species habitat may occur within area
<a href="#">Stenella longirostris</a> Long-snouted Spinner Dolphin [29]		Species or species habitat may occur within area
<a href="#">Steno bredanensis</a> Rough-toothed Dolphin [30]		Species or species habitat may occur within area
<a href="#">Tursiops aduncus</a> Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
<a href="#">Tursiops truncatus s. str.</a> Bottlenose Dolphin [68417]		Species or species habitat may occur within area
<a href="#">Ziphius cavirostris</a> Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area
<b>Extra Information</b>		
<b>State and Territory Reserves</b>		<a href="#">[ Resource Information ]</a>
<b>Name</b>	<b>State</b>	
Dirk Hartog Island	WA	
Francois Peron	WA	
Freycinet, Double Islands etc	WA	
Unnamed WA26400	WA	
<b>Invasive Species</b>		<a href="#">[ Resource Information ]</a>
Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.		
<b>Name</b>	<b>Status</b>	<b>Type of Presence</b>
<b>Birds</b>		
<i>Columba livia</i> Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
<i>Streptopelia senegalensis</i> Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
<b>Mammals</b>		
<i>Canis lupus familiaris</i> Domestic Dog [82654]		Species or species habitat likely to occur within area
<i>Capra hircus</i> Goat [2]		Species or species habitat likely to occur within area
<i>Felis catus</i> Cat, House Cat, Domestic Cat [19]		Species or species

Name	Status	Type of Presence
Mus musculus House Mouse [120]		habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
<b>Plants</b>		
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
<b>Nationally Important Wetlands</b>		<b>[ Resource Information ]</b>
<b>Name</b>		<b>State</b>
<a href="#">Shark Bay East</a>		WA

## Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

## Coordinates

-26.12083 113.22861

## Acknowledgements

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

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

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

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

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# Appendix C    Conservation Codes for Western Australian Flora and Fauna (DBCA, Jan 2018)

CONSERVATION CODE	CATEGORY
<b><u>Threatened species (T)</u></b>	<p>Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under Section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the <i>Biodiversity Conservation Act 2016</i> (BC Act).</p> <p><b>Threatened fauna</b> is that subset of ‘Specially Protected Fauna’ listed under Schedules 1 to 3 of the <i>Wildlife Conservation (Specially Protected Fauna) Notice 2018</i> for Threatened Fauna.</p> <p><b>Threatened flora</b> is that subset of ‘Rare Flora’ listed under schedules 1 to 3 of the <i>Wildlife Conservation (Rare Flora) Notice 2018</i> for Threatened Flora.</p> <p>The Assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below</p>
<b>Critically endangered species (CR)</b>	<p>Threatened species considered to be “<i>facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the criteria set out in the ministerial guidelines</i>”.</p> <p>Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the <i>Wildlife Conservation (Specially Protected Fauna) Notice 2018</i> for critically endangered fauna or the <i>Wildlife Conservation (Rare Flora) Notice 2018</i> for critically endangered flora.</p>
<b>Endangered species (EN)</b>	<p>Threatened species considered to be “<i>facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines</i>”.</p> <p>Listed as endangered under Section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the <i>Wildlife Conservation (Specially Protected Fauna) Notice 2018</i> for endangered fauna or the <i>Wildlife Conservation (Rare Flora) Notice 2018</i> for endangered flora.</p>

CONSERVATION CODE	CATEGORY
<b>Vulnerable species (VU)</b>	<p>Threatened species considered to be <i>“facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines”</i>.</p> <p>Listed as endangered under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the <i>Wildlife Conservation (Specially Protected Fauna) Notice 2018</i> for vulnerable fauna or the <i>Wildlife Conservation (Rare Flora) Notice 2018</i> for vulnerable flora.</p>
<b>Extinct species (EX)</b>	<p>Species where <i>“there is no reasonable doubt that the last member of the species has died”</i>, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).</p> <p>Published as presumed extinct under schedule 4 of the <i>Wildlife Conservation (Specially Protected Fauna) Notice 2018</i> for extinct fauna or the <i>Wildlife Conservation (Rare Flora) Notice 2018</i> for extinct flora.</p>
<b>Extinct in the wild species (EW)</b>	<p>Species that <i>“is known only to survive in cultivation, captivity or as a naturalised population well outside its part range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form”</i>, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).</p> <p>Currently there are no threatened fauna or flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.</p>
<b><u>Specially protected species</u></b>	<p>Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.</p> <p>Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.</p>

CONSERVATION CODE	CATEGORY
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<b>Migratory species (MI)</b>	<p>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; and listing is otherwise in accordance with the ministerial guidelines (Section 15 of the BC Act).</p> <p>Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and the Republic of Korea (ROKAMBA), and fauna subject to the <i>Convention on the Conservation of Migratory Species of Wild Animals</i> (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements of treaties, excluding species that are listed as Threatened species.</p> <p>Published as migratory birds protected under an international agreement under schedule 5 of the <i>Wildlife Conservation (Specially Protected Fauna) Notice 2018</i>.</p>
<b>Species of special conservation interest (conservation dependent fauna) (CD)</b>	<p>Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).</p> <p>Published as conservation dependent fauna under schedule 6 of the <i>Wildlife Conservation (Specially Protected Fauna) Notice 2018</i>.</p>
<b>Other specially protected species (OS)</b>	<p>Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).</p> <p>Published as other specially protected fauna under schedule 7 of the <i>Wildlife Conservation (Specially Protected Fauna) Notice 2018</i>.</p>

CONSERVATION CODE	CATEGORY
<b><u>Priority species (P)</u></b>	<p>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 flora.</p> <p>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.</p> <p>Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.</p>
<b>Priority 1 Poorly-known species</b>	<p>- 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, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases, or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.</p>
<b>Priority 2 Poorly-known species</b>	<p>- 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, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.</p>

CONSERVATION CODE	CATEGORY
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<p><b>Priority 3</b> <b>Poorly-known species</b></p>	<p>- 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 suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.</p>
<p><b>Priority 4</b> <b>Rare, Near Threatened and other species in need of monitoring</b></p>	<p>- (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.</p> <p>(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.</p> <p>(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>

## Appendix D Relevé Field Sheets

<b>STRUCTURAL VEGETATION, FLORA – Relevé</b>										<b>SITE_ID: R01</b>
<b>Date: 04/09/2019</b>	<b>GPS:</b>	7	2	2	8	3	2	.7	<b>E</b>	<b>Structural comm. type</b>
		7	1	0	9	0	5	8	.7	
<b>Recorder: GM</b>	<b>Photo no. + direction: Figure 1 below</b>									<i>Acacia ligulata</i> scattered shrubs
<b>Location: Sunday Island Bay DE 17</b>										

<b>Condition:</b> Pristine Excellent Very Good <b>Good</b> Degraded Completely Degraded	
<b>Aspect:</b> N NE E SE <b>S</b> SW W NW	<b>Slope:</b> Flat Gentle <b>Mod</b> Steep
<b>Geology:</b> Gran Lat <b>Lime</b> Other	<b>Rock:</b> 0 <2 2-10 10-20 20-50 >50
<b>Soil Colour:</b> Grey Dark Brown Light Brown Orange/Brown Red/Brown <b>White</b> Yellow	<b>Soil Type:</b> C CL CLS CS L LS <b>S</b> SCL SL SP ZCL ZL ZS
<b>Litter (% cover &amp; depth): 80% 2cm</b>	<b>Bare Ground (% cover): 30 – 40%</b>
<b>Hydrology:</b> <b>Good drain</b> Poor drain Wet all year Seas wet winter/spring	<b>Topographic position:</b> Upland Wetland Rock Outcrop Drainage Depression Creekline Riparian Bank Gully Plain Slope Lower <b>Slope Middle</b> Slope Upper Valley Flat

Layer	Height (m)	Cover	Plant Species (Dominant 3 first)
Tree (T2)	10-30	NA	
Tree (T3)	< 10	NA	
Shrub (S1)	> 2	NA	
Shrub (S2)	1-2	<2%	<i>Acacia ligulata</i>
Shrub (S3)	0-1	>70%	<i>Thryptomene dampieri, Calandrinia polyandra, Senecio pinnatifolius</i>
Sedge/Rush (VR)		NA	
Herb (H)		NA	
Grass (G)		<2	<i>Poaceae</i> sp.
Other (climbers) (C)			

Cover Codes: D >70% M 30-70% S 10-30% V 2-10% VV <2% E <5% Emergent \* = Introduced

Surrounding plants: *Acanthocarpus preissii*

<b>STRUCTURAL VEGETATION, FLORA – Relevé</b>										<b>SITE_ID: R02</b>
<b>Date: 04/09/2019</b>	<b>GPS:</b>	7	2	3	0	3	9	.1	<b>E</b>	<b>Structural comm. type</b>
		7	1	0	9	0	8	0	.9	
<b>Recorder: GM</b>	<b>Photo no. + direction: Figure 2 below</b>									<i>Acacia ligulata, Thryptomene dampieri &amp; Scaevola crassifolia low closed heath</i>
<b>Location:</b>										

<b>Condition:</b> Pristine Excellent <b>Very Good</b> Good Degraded Completely Degraded	
<b>Aspect:</b> N NE E SE <b>S</b> SW W NW	<b>Slope:</b> Flat Gentle <b>Mod</b> Steep
<b>Geology:</b> Gran Lat <b>Lime</b> Other	<b>Rock:</b> 0 <2 2-10 10-20 20-50 >50
<b>Soil Colour:</b> Grey Dark Brown Light Brown Orange/Brown Red/Brown <b>White</b> Yellow	<b>Soil Type:</b> C CL CLS CS L LS <b>S</b> SCL SL SP ZCL ZL ZS
<b>Litter (% cover &amp; depth): 10% - 1cm</b>	<b>Bare Ground (% cover): 20%</b>
<b>Hydrology:</b> <b>Good drain</b> Poor drain Wet all year Seas wet winter/spring	<b>Topographic position:</b> Upland Wetland Rock Outcrop Drainage Depression Creekline Riparian Bank Gully Plain Slope Lower <b>Slope Middle</b> Slope Upper Valley Flat

Layer	Height (m)	Cover	Plant Species (Dominant 3 first)
Tree (T2)	10-30	NA	
Tree (T3)	< 10	NA	
Shrub (S1)	> 2	NA	
Shrub (S2)	1-2	NA	
Shrub (S3)	0-1	>70%	<i>Acacia ligulata, Thryptomene dampieri, Scaevola crassifolia</i>
Sedge/Rush (VR)		NA	
Herb (H)		<2	<i>Senecio pinnatifolius</i>
Grass (G)		<2	<i>Poaceae sp., Spinifex longifolius</i>
Other (climbers) (C)			

Cover Codes: D >70% M 30-70% S 10-30% V 2-10% VV <2% E <5% Emergent \* = Introduced

Surrounding plants: *Diplolaena grandiflora, Acanthocarpus preissii, Alyxia buxifolia, Frankenia pauciflora, Crassula colorata*



*Figure 3 Relevé 1*



*Figure 4 Relevé 2*

<b>STRUCTURAL VEGETATION, FLORA – Relevé</b>										<b>SITE_ID: R03</b>
<b>Date: 05/09/2019</b>	<b>GPS:</b>	7	2	3	3	4	8	.96	<b>E</b>	<b>Structural comm. type</b>
		7	1	0	9	0	5	1	.64	
<b>Recorder: GM</b>	<b>Photo no. + direction: Figure 5 below</b>									<i>Acacia ligulata</i> scattered shrubs
<b>Location:</b>										

<b>Condition:</b>	Pristine	Excellent	Very Good	<b>Good</b>	Degraded	Completely Degraded								
<b>Aspect:</b>	N	NE	E	SE	S	<b>SW</b>	W	NW						
<b>Slope:</b>	Flat	Gentle	<b>Mod</b>	Steep										
<b>Geology:</b>	Gran	Lat	<b>Lime</b>	Other										
<b>Rock:</b>	0	<2	2-10	10-20	20-50	>50								
<b>Soil Colour:</b>	Grey	Dark Brown	Light Brown				<b>Soil Type:</b>	C	CL	CLS	CS	L	LS	
	Orange/Brown	Red/Brown	<b>White</b>	Yellow				<b>S</b>	SCL	SL	SP	ZCL	ZL	ZS
<b>Litter (% cover &amp; depth):</b>	2cm			<b>Bare Ground (% cover): 20%</b>										
<b>Hydrology:</b>	<b>Good drain</b>	Poor drain			<b>Topographic position:</b>	Upland	Wetland	Rock		Outcrop				
	Wet all year	Seas wet	winter/spring			Drainage Depression	Creekline	Riparian Bank	Gully					
			Plain	Slope Lower	<b>Slope Middle</b>	Slope Upper	Valley	Flat						

Layer	Height (m)	Cover	Plant Species (Dominant 3 first)
Tree (T2)	10-30	NA	
Tree (T3)	< 10	NA	
Shrub (S1)	> 2	NA	
Shrub (S2)	1-2	<2	<i>Acacia ligulata</i>
Shrub (S3)	0-1	>70%	<i>Thryptomene dampieri</i> , <i>Frankenia pauciflora</i> , <i>Atriplex bunburyana</i> , <i>Atriplex vesicaria</i> , <i>Swainsona</i> sp.
Sedge/Rush (VR)		NA	
Herb (H)			<i>Senecio pinnatifolius</i> , <i>Pembertonia latisquamea</i> , <i>Acanthocarpus preissii</i>
Grass (G)		NA	
Other (climbers) (C)		NA	

Cover Codes: D >70% M 30-70% S 10-30% V 2-10% VV <2% E <5% Emergent \* = Introduced

Surrounding plants:

<b>STRUCTURAL VEGETATION, FLORA – Relevé</b>										<b>SITE_ID: R04</b>
<b>Date: 05/09/2019</b>	<b>GPS:</b>	7	2	2	6	2	3	.7	<b>E</b>	<b>Structural comm. type</b>
		7	1	0	8	9	9	.8	<b>N</b>	
<b>Recorder: GM</b>	<b>Photo no. + direction: Figure 6 below</b>									<i>Diplolaena grandiflora</i> and <i>Acacia ligulata</i> open heath
<b>Location:</b>										

<b>Condition:</b>	Pristine	Excellent	Very Good	<b>Good</b>	Degraded	Completely Degraded											
<b>Aspect:</b>	N	NE	E	SE	S	<b>SW</b>	W	NW			<b>Slope:</b>	Flat	Gentle	<b>Mod</b>	Steep		
<b>Geology:</b>	Gran	Lat	<b>Lime</b>	Other					<b>Rock:</b>	0	<2	2-10	10-20	20-50	>50		
<b>Soil Colour:</b>	Grey	Dark Brown		Light Brown					<b>Soil Type:</b>	C	CL	CLS	CS	L	LS		
	Orange/Brown	Red/Brown	<b>White</b>	Yellow					<b>S</b>	SCL	SL	SP	ZCL	ZL	ZS		
<b>Litter (% cover &amp; depth): 80%</b>						<b>Bare Ground (% cover): 20%</b>											
<b>Hydrology:</b>				<b>Good drain</b>		Poor drain		<b>Topographic position:</b>				Upland		Wetland		Rock Outcrop	
Wet all year				Seas wet		winter/spring		Drainage Depression		Creekline		Riparian Bank		Gully			
								Plain		Slope Lower		<b>Slope Middle</b>		Slope Upper		Valley Flat	

Layer	Height (m)	Cover	Plant Species (Dominant 3 first)
Tree (T2)	10-30	NA	
Tree (T3)	< 10	NA	
Shrub (S1)	> 2	NA	
Shrub (S2)	1-2	30 – 70	<i>Diplolaena grandiflora</i> , <i>Acacia ligulata</i>
Shrub (S3)	0-1	30 – 70	<i>Scaevola</i> sp., <i>Diplolaena grandiflora</i> , <i>Atriplex vesicaria</i> , <i>Atriplex bunburyana</i> , <i>Thryptomene dampieri</i> , <i>Frankenia pauciflora</i>
Sedge/Rush (VR)		NA	
Herb (H)		2 – 10	<i>Senecio pinnatifolius</i> , <i>Acanthocarpus preissii</i> , <i>Spinifex longifolius</i>
Grass (G)		NA	
Other (climbers) (C)		NA	

Cover Codes: D >70% M 30-70% S 10-30% V 2-10% VV <2% E <5% Emergent \* = Introduced

Surrounding plants:



*Figure 5 Relevé 3*



*Figure 6 Relevé 4*

<b>STRUCTURAL VEGETATION, FLORA – Relevé</b>										<b>SITE_ID: R05</b>
<b>Date: 05/09/2019</b>	<b>GPS:</b>	7	2	2	3	3	8	.0	E	<b>Structural comm. type</b>
		7	1	0	8	8	9	7	.4	
<b>Recorder: GM</b>	<b>Photo no. + direction: Figure 7 below</b>									<i>Acacia ligulata</i> scattered shrubs.
<b>Location:</b>										

<b>Condition:</b> Pristine Excellent Very Good <b>Good</b> Degraded Completely Degraded										
<b>Aspect:</b> N NE E SE <b>S</b> SW W NW					<b>Slope:</b> Flat <b>Gentle</b> Mod Steep					
<b>Geology:</b> Gran Lat <b>Lime</b> Other					<b>Rock:</b> 0 <2 2-10 10-20 20-50 >50					
<b>Soil Colour:</b> Grey Dark Brown Light Brown Orange/Brown Red/Brown <b>White</b> Yellow					<b>Soil Type:</b> C CL CLS CS L LS <b>S</b> SCL SL SP ZCL ZL ZS					
<b>Litter (% cover &amp; depth): 90 – 95%</b>					<b>Bare Ground (% cover): 5%</b>					
<b>Hydrology:</b> <b>Good drain</b> Poor drain Wet all year Seas wet winter/spring				<b>Topographic position:</b> Upland Wetland Rock Outcrop Drainage Depression Creekline Riparian Bank <b>Gully</b> Plain Slope Lower Slope Middle Slope Upper Valley Flat						

Layer	Height (m)	Cover	Plant Species (Dominant 3 first)
Tree (T2)	10-30	NA	
Tree (T3)	< 10	NA	
Shrub (S1)	> 2	NA	
Shrub (S2)	1-2	<2	<i>Acacia ligulata</i>
Shrub (S3)	0-1	>70%	<i>Frankenia pauciflora, Atriplex bunburyana</i>
Sedge/Rush (VR)		NA	
Herb (H)		NA	
Grass (G)		<2	<i>Poaceae</i> sp.
Other (climbers) (C)			

Cover Codes: D >70% M 30-70% S 10-30% V 2-10% VV <2% E <5% Emergent \* = Introduced

Surrounding plants: *Pembertonia latisquamea*, \**Hypochaeris* sp., Thistle sp.



*Figure 7 Relevé 5*