

Synergy Site, Denham

Flora and Fauna Report

Prepared for:

Horizon Power

November 2019

people
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 professional

Document	Revision	Barrand by	Daviewed by	Admin Review	Submitted to Client		
Reference	Kevision	Prepared by	Reviewed by	Aumin Review	Copies	Date	
3242AA	Rev0	C. McDonald A. Hide	S. Walker	N. Lindroos	-	06/09/19	
3242AA	Rev1	360 Environmental	Horizon Power	-	1 Electronic (email)	09/09/19	
3242AA	Rev2	360 Environmental	Horizon Power	N. Lindroos	1 Electronic (email)	12/11/19	

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# **Executive Summary**

Horizon Power commissioned 360 Environmental Pty Ltd to undertake a biological survey and assessment to support the proposed construction of a new hybrid (solar, diesel, battery storage) power station in Denham, Western Australia. A flora and fauna survey were completed within the defined area, approximately 2 km north east of the Denham townsite, in the Carnarvon bioregion.

### Flora and Vegetation

The desktop assessment identified 37 conservation significant species occurring within 50 km of the Survey Area. A likelihood of occurrence assessment was undertaken and determined nine species as having a high likelihood of occurrence, 12 species as having a medium likelihood of occurrence, 13 species as having a low likelihood of occurrence and a total of three species were recorded within the Survey Area.

The detailed flora and vegetation survey recorded the floristic composition and vegetation types from four quadrats and additional mapping notes. The survey recorded a total of 59 taxa from 45 genera across 26 families.

No Threatened flora species pursuant to the *EPBC Act* 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the *BC Act* 2016 were recorded during the survey.

Three DBCA listed Priority flora have previously been recorded within 0.1 - 28 km from the Survey Area in *Acanthocarpus affinis rupestris* (P2), *Olearia occidentissima* (P2) and *Triodia plurinervata* (P3). The presence of these species is unlikely to be a statutory constraint for the Survey Area and is dealt with by DWER and DBCA on a case by case basis.

A total of three vegetation types were mapped in:

- AlTdTp: *Triodia* Hummock Grassland (13.87 ha)
- AlCrAp: Acacia Shrubland (0.13 ha)
- AlTdAp: Myrtaceae Low Shrubland (0.74 ha).

Towards the southern portion of the Survey Area, a significant change in vegetation is observed due to the loss of *Triodia plurinervata* dominant grasslands. This change is expected and consistent with broad scale soil and vegetation mapping.

Vegetation condition within the Survey Area ranged from Excellent to Completely Degraded consisting of:

Excellent: 12.07 ha, 81.46%Very Good: 2.65 ha, 17.88%

Good: 0.03 ha, 0.21%

• Completely Degraded (cleared areas): 0.07 ha, 0.45%



Five introduced species were recorded during the survey. One species, \*Lycium ferocissimum is listed as a Weed of National Significance by the Department of Energy and Environment (2018).

#### Vertebrate Fauna

A total of 213 vertebrate fauna species were retrieved from the DBCA database searches. Of these, 37 are conservation significant vertebrate fauna species from 15 families, and includes:

- 134 bird species, including 31 species of conservation significance
- 14 mammal species, including three species of conservation significance
- 65 reptile species, including three species of conservation significance
- No amphibian species, and therefore no species of conservation significance.

The field survey recorded 40 terrestrial vertebrate fauna species, comprised of 26 birds and 10 mammals and six reptiles. No fauna species of conservation significance (Threatened or Priority), or evidence such as tracks or scats, were recorded within the Survey Area.

A total of nine fauna habitat assessments were undertaken during the field survey, with three fauna habitat types being identified as:

- Acacia Shrubland, over Triodia
- Acacia Shrubland
- Cleared/Completely Degraded.

The results of the likelihood of occurrence assessment determined that:

- No fauna species of conservation significance were recorded within the Survey Area
- Two fauna species of conservation significance are considered to have a high likelihood of occurrence within the Survey Area:
  - Osprey (Pandion haliaetus) Migratory/Marine
  - Western Grasswren (Amytornis textilis textilis) Priority 4
- Eight conservation significant fauna species are considered to have a medium likelihood of occurrence within the Survey Area. This includes four marine/coastal birds, as well as the following three terrestrial species:
  - Pacific Swift (Apus pacificus) Migratory/Marine
  - Malleefowl (Leipoa ocellata) Vulnerable
  - Bilby (Macrotis lagotis) Vulnerable
  - Woma (Aspidites ramsayi) Priority 1 (South West Population)



• The remaining 27 conservation significant species are considered to have a low likelihood of occurrence.

None of the fauna habitats identified within the Survey Area are considered to be preferred habitat for any of the conservation significant species considered to have a high or medium likelihood of occurrence. It is therefore considered that any potential disturbance within the Survey Area is unlikely to impact these species.





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# 1 Introduction

# 1.1 The Project

Horizon Power commissioned 360 Environmental Pty Ltd (360 Environmental) to undertake a biological survey and assessment to support the proposed construction of a new hybrid (solar, diesel, battery storage) power station in Denham, Western Australia (herein known as the Project). A flora and fauna survey was completed within the defined area, approximately 2 km north east of the Denham townsite, in the Carnarvon bioregion (herein referred to as the Survey Area).

The Survey Area comprised a portion of Lot 3004 and an associated track, covering approximately 14.8 hectares (ha) (Figure 1).

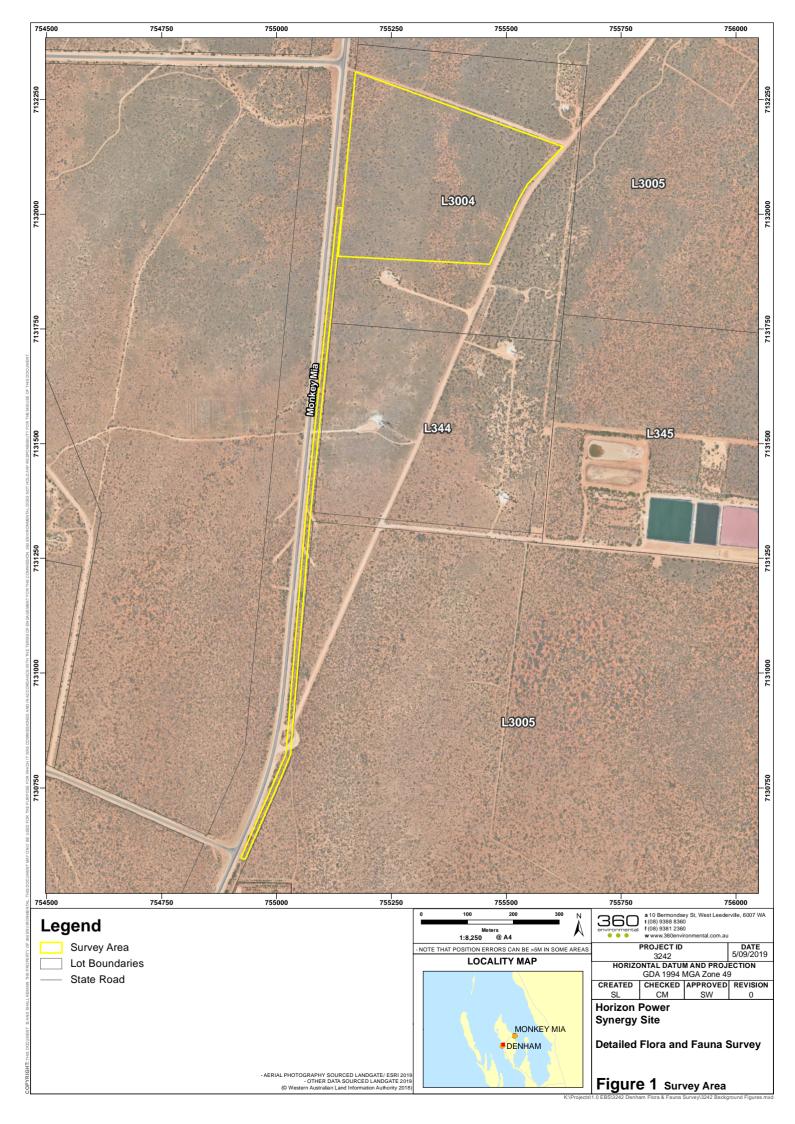
# 1.2 Objectives and Scope

The purpose of the survey is to delineate key flora and fauna values within the Survey Area and identify potential environmental sensitivities that may impact the Project.

The scope of works includes:

- Desktop Assessment
- Field Survey
- Post Survey Debrief Email
- Biological Report
- GIS Spatial Data.







# 2 Background

# 2.1 Protection of Flora, Vegetation and Fauna

Western Australian flora and fauna is protected formally and informally by legislative and non-legislative measures, which are as follows:

### Legislative measures:

- Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (Threatened Species Scientific Committee, 2015)
- WA Biodiversity Conservation Act 2016 (BC Act)
- WA Environmental Protection Act 1986 (EP Act)
- WA Biosecurity and Agriculture Management Act 2007 (BAM Act).

### Non-legislative measures:

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

# 2.2 Biophysical Environment

### 2.2.1 Climate

The closest long-term Bureau of Meteorology (BoM) weather station with a complete dataset is Denham (Station 6044), located approximately 2 km southwest of the Survey Area.

The long-term mean minimum temperature for Denham ranges from 12.7°C (July) to 22.9°C (February) (1988 to 2019) and the long-term mean maximum temperature ranges from 21.8°C (July) to 31.8°C (February) (1988 to 2019) (Figure 2) (Bureau of Meteorology, 2019). The long-term annual average rainfall is 223.2 millimetres (mm) (1893 to 2019) (Bureau of Meteorology, 2019).

The Denham weather station recorded 146.0 mm of rainfall in the 12 months prior to the survey (July 2018 to June 2019), which is 77.3 mm below to the long-term average of 223.2 mm (Bureau of Meteorology, 2019). In the three months prior to the survey (April 2019 to June 2019), 81.2 mm of rainfall was recorded, which is 23.2 mm below the long-term average of 104.4 mm for the same time period (1893 to 2019) (Bureau of Meteorology, 2019). Six weeks prior to the survey being undertaken the Denham weather station recorded a total of 60.4 mm of rain in three successive days inclusive of the 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> of June 2019 (Bureau of Meteorology, 2019).



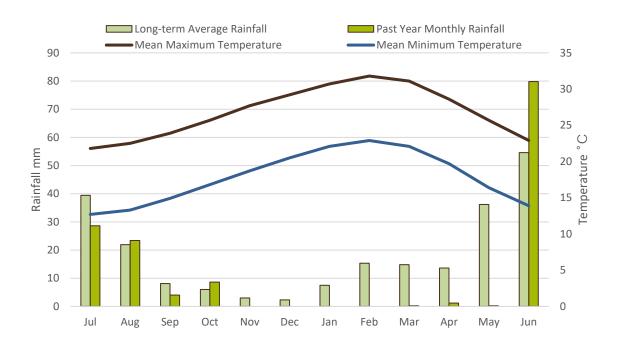


Figure 2: Long term and Monthly Total Rainfall, Maximum and Minimum temperatures for Denham (6044) (Bureau of Meteorology, 2019)

### 2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Department of the Environment and Energy, 2016). The Survey Area occurs within the Carnarvon bioregion and the Wooramel (CAR2) subregion.

The Wooramel Subregion is characterised by alluvial plains associated with downstream sections and deltas of Gascoyne, Minilya and Wooramel Rivers. The subregion is represented by tree to shrub steppe over hummock grasslands on and between aeolian red sand dunefields, extensive in the north and east as well as on top of Kennedy Range (Desmond and Chant, 2001). The demonstrated of permian sediments are common in northern parts (Desmond and Chant, 2001). Southern areas comprise limestone plateaux overlain by red sand plains. Saline alluvial plains with samphire and saltbush low shrublands in near-coastal areas (Desmond and Chant, 2001).

#### 2.2.3 Soil Landscapes and Land Systems

Soil landscapes and land system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales, and has been captured at scales ranging from 1:20,000 to 1:250,000 (Department of Agriculture and Food WA, 2012). The Survey Area occurs within two land systems (Figure 3) and are described below:



- Taillefer System described as undulating sandy plains of calcareous sand over limestone with minor limestone ridges, with low coastal dunes and sea cliffs supporting mainly hard spinifex grasslands with numerous shrubs
- **Peron System** described as undulating plains of calcareous sand supporting low *acacia* shrublands and *Lamarchea hakeifolia* heaths (Department of Agriculture and Food WA, 2012).

### 2.2.4 Hydrology and Wetlands

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

- Little Lagoon, a natural pool located approximately 500 m to the north west of the Survey Area
- Wastewater Treatment Plant, an open water body occurring approximately 600 m south east of the Survey Area.

# 2.3 Biological Environment

# 2.3.1 Broad Vegetation Types

Mapping of pre-European broad vegetation within Western Australia was completed on a broad scale (1:1,000,000) by (Beard, 1976). These vegetation types were later reassessed by Shepherd et al. (2002) with some larger vegetation units divided into smaller units. Together, this pre-European database contains a total of 819 vegetation types within Western Australia.

Two broad vegetation types are mapped over the Survey Area (Figure 4). These vegetation types areas described below and their representation at a local, regional and state level is shown in Table 1.

- Perron 112: Shrub-steppe, Hummock grassland with scattered shrubs or mallee *Triodia* spp. Acacia spp., Grevillea spp. Eucalyptus spp.
- Denham 1101: Thicket, Wattle, Casuarina and teatree acacia-allocasuarinamelaleuca alliance.



Table 1: Broad Vegetation Types within the State, Regional and Local Representation (Department of Biodiversity Conservation and Attractions, 2019a)

Vegetation Type	Pre-European Extent (ha)	Current Extent (ha)	Remaining (%)	Current Extent Managed in DBCA Lands (%)				
Poprocentation as	ross Western Australi	0		Lands (%)				
· ·	I							
Perron 112	26,454.24	25,150.08	95.07	4.39				
Denham 1101	19,737.03	16,260.14	82.38	58.79				
Representation ac	Representation across the Carnarvon Bioregion							
Perron 112	20,101.96	20,010.92	99.55	1.75				
Denham 1101	15,232.09	15,232.09	100	70.29				
Representation ac	ross the Wooramel Su	ıbregion						
Perron 112	20,101.96	20,010.92	99.55	1.75				
Denham 1101	15,232.09	15,232.09	100	70.29				
Representation across the Shire of Shark Bay								
Perron 112	26, 454.24	25,150.08	95.07	4.39				
Denham 1101	16,263.62	16,260.14	99.8	71.35				

#### 2.3.2 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared to prevent degradation of important environmental values such as Threatened flora, TECs or significant wetlands. Exemptions contained in the *Environmental Protection (Clearing of Native vegetation) Regulations* 2004 for low impact land clearing do not apply in ESAs and a clearing permit is required.

The entire Survey Area is identified within a mapped ESA. This ESA comprises the entire western portion of the Shire of Shark Bay and is likely attributed to the World Heritage Property of the Shark Bay (Department of Water and Environmental Regulation, 2018). The Survey Area and the surrounding townsite of Denham area mapped as excluded from the boundary of the of the World Heritage Area (Department of Sustainability Environment Water Population and Communities, 2012). However, the ESA mapping is likely to reflect associated buffers.

The Shark Bay World Heritage area covers 23,000 km<sup>2</sup> and is defined by the following key features (Department of Water and Environmental Regulation, 2018):

- Covers three major climatic regions and forms a change-over between two major groups of plant species the South West and Eremaean provinces
- Twenty-five per cent (283 species) of the area's vascular plants are at the limits of their range in Shark Bay. Many vegetation associations and plant species are found only in the areas between different biological zones
- The area south of Freycinet Estuary contains the unique type of vegetation known as tree heath. There are also at least 51 species endemic to the region and others that are considered new to science



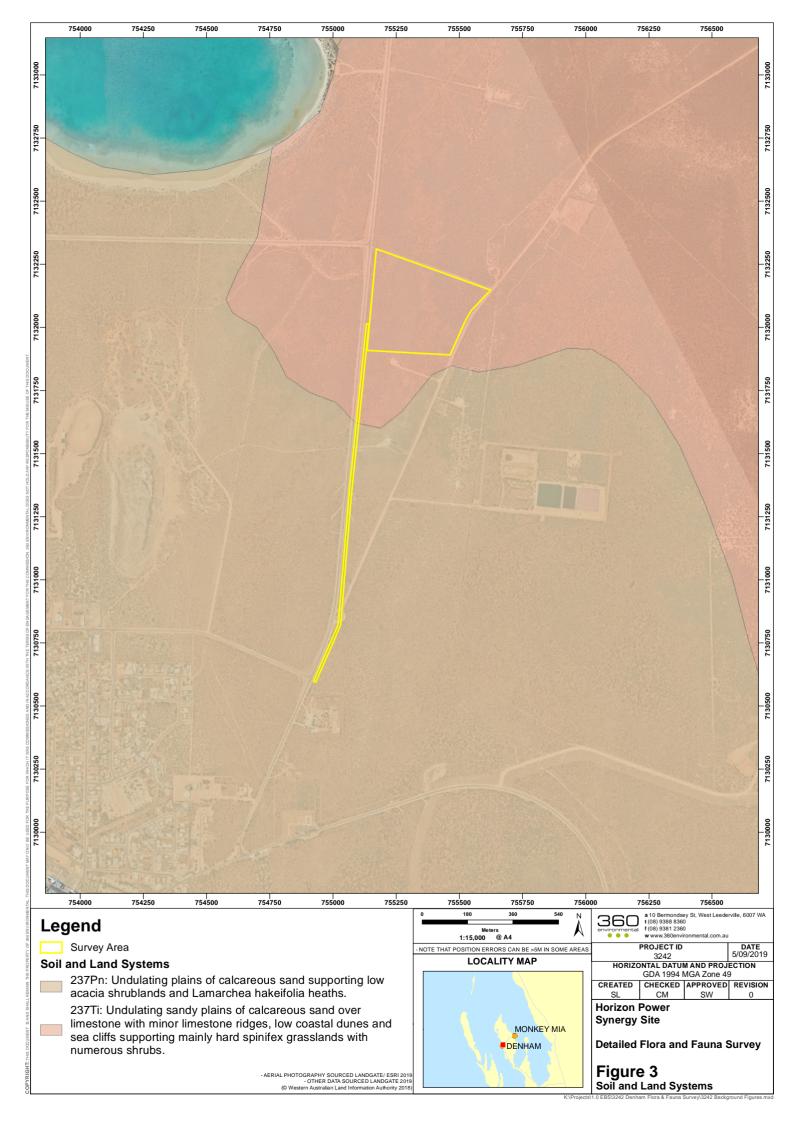
- The area is of major zoological importance, primarily due to habitats on peninsulas and islands being isolated from the disturbance that has occurred elsewhere. Of the 26 species of endangered Australian mammals, five are found on Bernier and Dorre Islands. These are the Boodie or Burrowing Bettong, Rufous Hare Wallaby, Banded Hare Wallaby, the Shark Bay Mouse and the Western Barred Bandicoot
- Also rich in avifauna with over 230 species or 35 per cent of Australia's bird species have been recorded. A number of birds attain their northern limit at Shark Bay including the Regent Parrot, Western Yellow Robin, Blue-Breasted Fairy Wren and Striated Pardalote
- The region is noted for the diversity of its amphibians and reptiles, supporting nearly 100 species. Again, many species are at the northern or southern limit of their range. The area is also significant for the variety of burrowing species, such as the Sandhill frog, which apparently needs no surface water. Shark Bay is home to three endemic sand swimming skinks, and 10 of the 30 dragon lizard species found in Australia
- The 12 species of seagrass found in Shark Bay make it one of the most diverse seagrass assemblages in the world. Seagrass covers over 4,000 square km of the bay, and the 1,030 km<sup>2</sup> Wooramel Seagrass Bank is the largest structure of its type in the world
- Seagrass has contributed significantly to the evolution of Shark Bay. It has modified
  the physical, chemical and biological environment as well as the geology and has led
  to the development of major marine features such as Faure Sill. Faure Island is an
  emergent portion of the 'Faure Sill', a sandbar overlaying sandstone that crosses the
  eastern gulf of Shark Bay from Peron Peninsula to the mainland. Interestingly, it is
  this sandbar that has created the vast areas of sandy hypersaline shallows that
  support the famous Stromatolites of Shark Bay
- The barrier banks associated with the growth of seagrass over the last 5,000 years –
  and the low rainfall, high evaporation and low tidal flushing have produced the
  hypersaline Hamelin Pool and L'haridon Bight. This hypersaline condition is conducive
  to the growth of cyanobacteria which trap and bind sediment to produce a variety of
  mats and structures including Stromatolites
- Stromatolites represent the oldest form of life on earth. They are representative of life-forms which lived some 3,500 million years ago. Hamelin Pool contains the most diverse and abundant examples of Stromatolite forms in the world
- Shark Bay is renowned for its marine fauna. The population of about 10,000 dugong, dolphins, humpback whales, green and loggerhead turtles are found in Shark Bay near their southern limits, with loggerhead turtles nesting on the beaches of Dirk Hartog Island and Peron Peninsula.

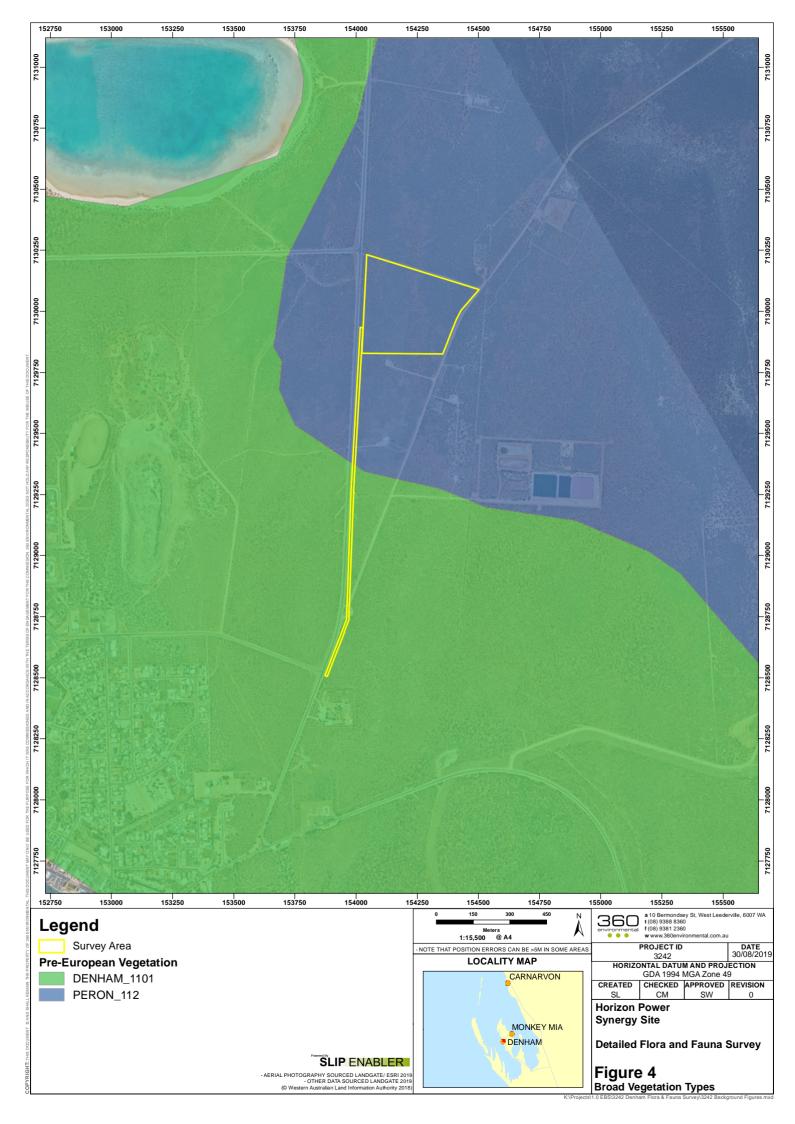


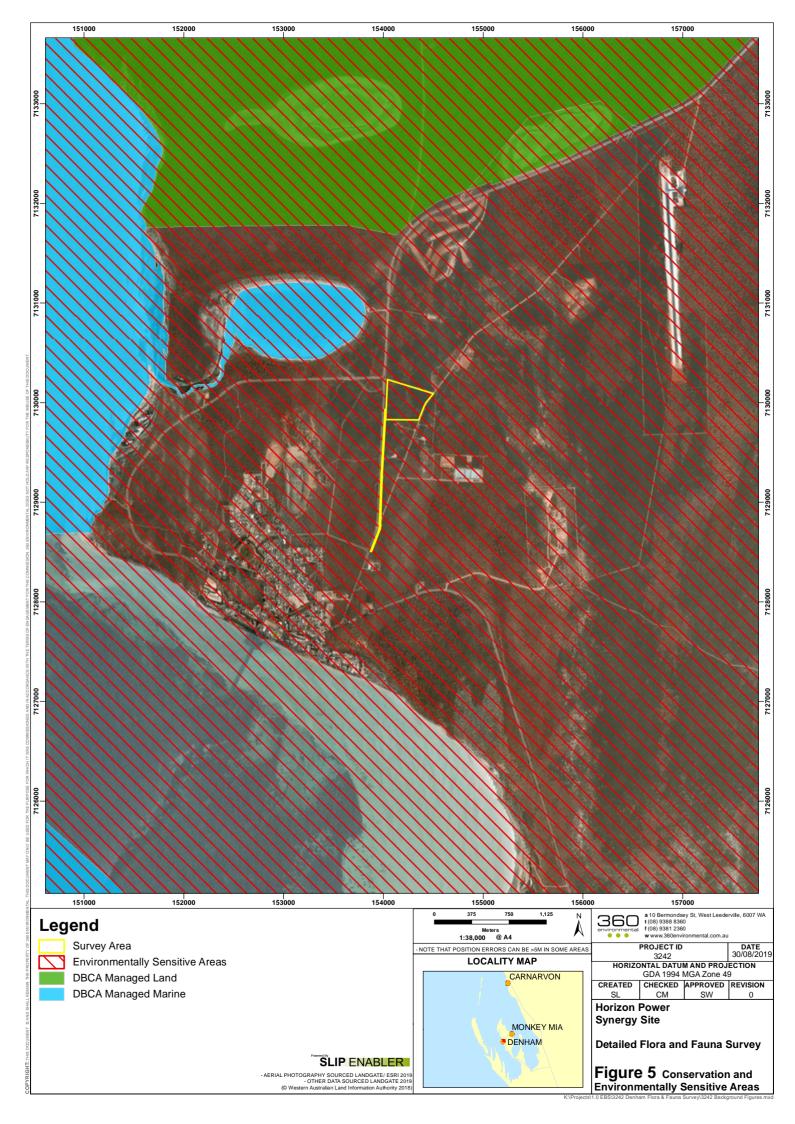
### 2.3.3 Conservation Areas

The Survey Area is not identified within a Conservation Area. The closest areas of conservation to the Survey Area are described below and shown in Figure 5.

- Francois Peron National Park located 1.5 km to the north of the Survey Area and is vested under the Conservation Commission of Western Australia
- Shark Bay Marine Park, inclusive of Little Lagoon, located 500 m to the north west of the Survey Area and is vested under the Marine Parks and Reserves Authority (Department of Biodiversity Conservation and Attractions, 2017).









# 3 Methods

# 3.1 Requirements for Flora and Fauna Surveys

This survey has been carried out as per the EPA requirements for environmental surveying and reporting of flora and fauna surveys in Western Australia where relevant, and as documented in:

### Western Australia

- Technical Guidance Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority, 2016a)
- Technical Guidance Sampling Methods for Terrestrial Vertebrate Fauna (Environmental Protection Authority, 2016b)
- Technical Guidance Terrestrial Fauna Surveys (Environmental Protection Authority, 2016c).

#### Federal

- Matters of National Environmental Significance Significant impact guidelines 1.1
   Environment Protection and Biodiversity Conservation Act 1999 (Department of the Environment, 2013)
- Survey Guidelines for Australia's threatened mammals (Department of Sustainability Environment Water Population and Communities, 2011)
- Survey guidelines for Australia's threatened birds Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999 (Department of the Environment Water Heritage and the Arts, 2010).

# 3.2 Desktop Assessment

### 3.2.1 Database Searches

Database searches were undertaken to identify potential conservation significant flora and fauna taxa and Ecological Communities within or surrounding the Survey Area (herein known as the Study Area). Database search particulars are outlined in Table 2. The search buffer is comprised of 20 km, with the exception being the DBCA flora database searches which was increased to 50 km as recommended by DBCA.

Priority Ecological Communities (PEC) and Threatened Ecological Communities (TEC) within the Carnarvon bioregion were examined to determine if any corresponded with the Survey Area (Appendix A). In addition, an EPBC Protected Matters Search (PMST) was undertaken to identify the potential for Matters of National Environmental Significance (MNES) to occur within or surrounding the Survey Area (Department of the Environment and Energy, 2019).



Table 2: Database Searches of the Survey Area

Table 2: Database Searches of the Survey Area								
Database Name	Date Received	Search Target	Search Area					
Threatened and Priority Ecological Communities database (Department of Biodiversity Conservation and Attractions, 2019d)	13 June 2016	Listed TECs and PECs	20 km search buffer of the Survey Area					
Threatened and Priority Flora Database (TPFL) (Department of Biodiversity Conservation and Attractions, 2019g)	31 May 2019		50 km search buffer of the Survey Area					
DBCA Threatened and Priority Flora Species List (TP list) (Department of Biodiversity Conservation and Attractions, 2019g)	31 May 2019	Threatened Priority Flora	50 km search buffer of the Survey Area					
Western Australian Herbarium flora (Department of Biodiversity Conservation and Attractions, 2019f)	31 May 2019		50 km search buffer of the Survey Area					
DBCA Threatened and Priority Fauna List (Department of Biodiversity Conservation and Attractions, 2019e)	31 May 2019	Threatened Priority Fauna	20 km search buffer of the Survey Area					
NatureMap (Department of Biodiversity Conservation and Attractions, 2019c)	17 July 2019	Threatened Priority Flora and	20 km search buffer of the Survey Area					
Protected Matters Search Tool (Department of the Environment and Energy, 2019)	17 July 2019	Fauna	20 km search buffer of the Survey Area					

### 3.2.2 Likelihood of Occurrence

Conservation significant flora and fauna species identified from the desktop assessment were further examined to determine a likelihood of occurrence both prior and post field survey. The assessment was completed based on the likelihood of occurrence criteria presented in Table 3. Only species either recorded within the Survey Area or considered as having a high or medium likelihood of occurrence will be discussed in detail. Species classified as having a low likelihood of occurrence based on the above criteria will not be discussed unless a justification for this classification is required.



Table 3: Likelihood of Occurrence Criteria

Likelihood	Flora	Fauna
Recorded	Flora and fauna species reco	rded within the Survey Area during the field survey.
High	Previously recorded within Survey Area or within 15 km and suitable habitat potentially occurs in the Survey Area	Preferred habitat is present in the Survey Area and known species distribution has been recorded on more than one occasion within 20 km of the Survey Area in the last 15 years
Medium	Previously recorded within 15 to 50 km of the Survey Area and/or suitable habitat potentially occurs in the Survey Area	The species has been recorded on more than one occasion within 20 km of the Survey Area in the last 15 years, but limited appropriate habitat occurs in the Survey Area; or the High Likelihood of Occurrence criteria has not been met, however the species is known from the general area and has good dispersal abilities; or Preferred habitat for the species occurs in the Survey Area but the species has not been recorded within 20 km in the last 15 years
Low	No suitable habitat appears to be present in the Survey Area and records are greater than 50 km	No suitable habitat is present within the Survey Area or outside the species known distribution; or the species is known from the general area but has poor dispersal abilities

### 3.2.3 Literature Review

A literature review was undertaken to identify any previously completed surveys within the general region. This includes reviewing all publicly available reports to assist with understanding any key biological findings nearby.

# 3.3 Flora and Vegetation

#### 3.3.1 Field Survey

A detailed single season flora and vegetation survey was undertaken by Principal Botanist Catherine Krens (Flora Licence SL012486) and Ecologist Colleen McDonald (Flora Licence SL 012436) from the 24th to the 26th of July 2019. The field survey included an assessment of four quadrats, mapping notes, vegetation condition notes, opportunistic flora collections, observations and a targeted Priority flora search. The Survey effort and quadrat locations are shown in Figure 6.

A minimum of three quadrats of 30 x 30 m (900  $\text{m}^2$ ) were installed in representative vegetation types. Each quadrat was accurately measured using measuring tapes, and the northwest corner was demarcated with a steel fence dropper. At the NW corner of each quadrat, the location was recorded using a handheld Garmin GPS unit, and Fulcrum mobile data collection device with a photograph.



At each quadrat, the following data was recorded:

- Site code a unique identifier allocated to each quadrat
- Date and recorder a record of the date of quadrat sample and a list of the personnel involved in sampling the quadrat
- Location GPS coordinates (MGA94) measured from the north west corner of the quadrat
- Dimensions the size and shape of the quadrat
- Landform and soil description a description of the quadrat habitat
- Additional site descriptors location information that might be useful in vegetation classification including, slope, aspect, litter cover, bare ground cover and fire history
- Species list a comprehensive vascular flora species list
- Foliar cover the estimated total percentage foliar cover for each species recorded
- Height the average height (in meters) of each species recorded
- Vegetation description a description of the vegetation according to the National Vegetation Information System (NVIS), Level 5. According to this level, vegetation is classified to 'association', where the dominant growth form, height, cover and species (three species) for the three traditional strata (upper, mid and ground) are described
- Vegetation condition assessed according to the vegetation condition scale (Environmental Protection Authority, 2016a) and
- Photographs a photograph from the north west corner looking toward the south east corner was taken.

# 3.3.2 Flora of Conservation Significance

The Survey Area was traversed on foot and opportunistic collections were made to identify flora of conservation significance which were listed in the Desktop Assessment.

Specimens were collected for identification and lodgement at the Western Australian Herbarium (WAH).

#### 3.3.3 Taxonomy and Nomenclature

Where field identification of plant taxa was not possible, specimens were collected systematically for later identification using resources of the WAH. Taxonomy was completed by experienced Taxonomist Udani Sirisena at the WA herbarium.

The finalised species list was checked against FloraBase (Department of Biodiversity Conservation and Attractions, 2019b) to determine the species' conservation status and known distribution. Introduced species were compared against the BAM Act Declared



Plants list the WONS list to determine their status (Thorp and Lynch, 2000; Department of Energy and Environment, 2018).

#### 3.3.4 Statistical Analyses

All statistics were carried out using RStudio version 3.6.0 (R Studio Team, 2015). Quadrats were classified on the basis of similarity in species composition. Using the results of the observations made in the field, boundaries of the Vegetation Types were finalised on aerial photographs, at a scale of 1:5,000, with the aid of GPS coordinates taken during the field survey. The Vegetation Types were digitised and produced as electronic mapping data using GIS software.

In order to assess the adequacy of the field survey, a species accumulation curve was generated. The species accumulation curve analysed accumulation rates of species identified from the survey. This statistical test can determine if the area been adequately surveyed (species accumulation curves can be useful in estimating total species richness). The accumulation curve was based on presence absence data and the sample order being random with a maximum 999 permutations with four estimator curves (Chao 2, Jacknife 1, Jacknife 2 and Bootstrap) (R Studio Team, 2015). These estimator curves help predict the true total number of species that would be observed as the number of sites tends to infinity.

### 3.4 Vertebrate Fauna

# 3.4.1 Field Survey

A level 1 vertebrate fauna survey was undertaken from the 24<sup>th</sup> to the 26<sup>th</sup> of July 2019 by qualified Senior Zoologist Andrew Hide. The purpose of the field survey was to verify the accuracy of the desktop assessment and to further delineate and characterise the fauna assemblages and fauna habitat in the Survey Area. The field survey consisted primarily of fauna habitat assessments, systematic bird searches and opportunistic fauna observations. The survey effort is shown in Figure 6.

# 3.4.2 Fauna Habitat Assessment

Vegetation types and distinctive landforms were used to identify the broad faunal habitats in the Survey Area. These fauna habitats were then assessed for their potential to support species of conservation significance and the quality of habitat they provide to a wider suite of fauna.

A total of nine individual fauna habitat assessments were undertaken throughout the Survey Area. Each habitat assessment recorded the following information which was used in conjunction with aerial imagery to identify and map fauna habitat types:

Location within the Survey Area (GPS co-ordinate)



- Condition was assessed at the assessment site using the (Environmental Protection Authority, 2016b) vegetation condition scale
- Dominant vegetation and structure (e.g. number of vegetation strata)
- Hollow-bearing trees and dead stags (e.g. average size and abundance of hollows)
- Description of any rock and rocky outcrops
- Logs (e.g. abundance and size)
- Substrate (e.g. leaf litter)
- Wetlands, creeks, rivers, dams and other water bodies
- Description of any observed nests and roosts (if present)
- Subterranean roosts (e.g. caves, disused mineshafts and/or adits)
- Associated fauna species observed using the habitat
- Disturbance (e.g. cattle grazing, fire)
- Photo showing a typical example of the broad fauna habitat type.

#### 3.4.3 Systematic Bird Survey

Systematic bird surveys were undertaken within the Survey Area for 20 minutes in a 2 ha quadrat (Environmental Protection Authority, 2016c) at each fauna habitat assessment location (at a minimum). Where practicable, this was undertaken during typical peak periods of activity when birds are calling and moving about, which is typically in the 3-4 hours of sunrise, particularly during warmer periods.

### 3.4.4 Opportunistic Observation

Fauna were opportunistically observed and recorded within the Survey Area, which involved targeted searches of habitats that potentially support fauna of conservation significance as well as systematic searches which included looking through leaf litter, overturning rocks, looking under decorticating bark and searches for scats, tracks, burrows and other traces of animals. If conservation significant species were located, the coordinates were geospatially recorded with the Fulcrum mobile application providing accurate GPS locations for each record.

In addition, opportunistic records of fauna species encountered while travelling throughout the Survey Area were documented. Opportunistic data comprises records of fauna species by location and coordinates were taken through the use of the Fulcrum mobile application.

### 3.4.5 Targeted Malleefowl and Bilby Searches

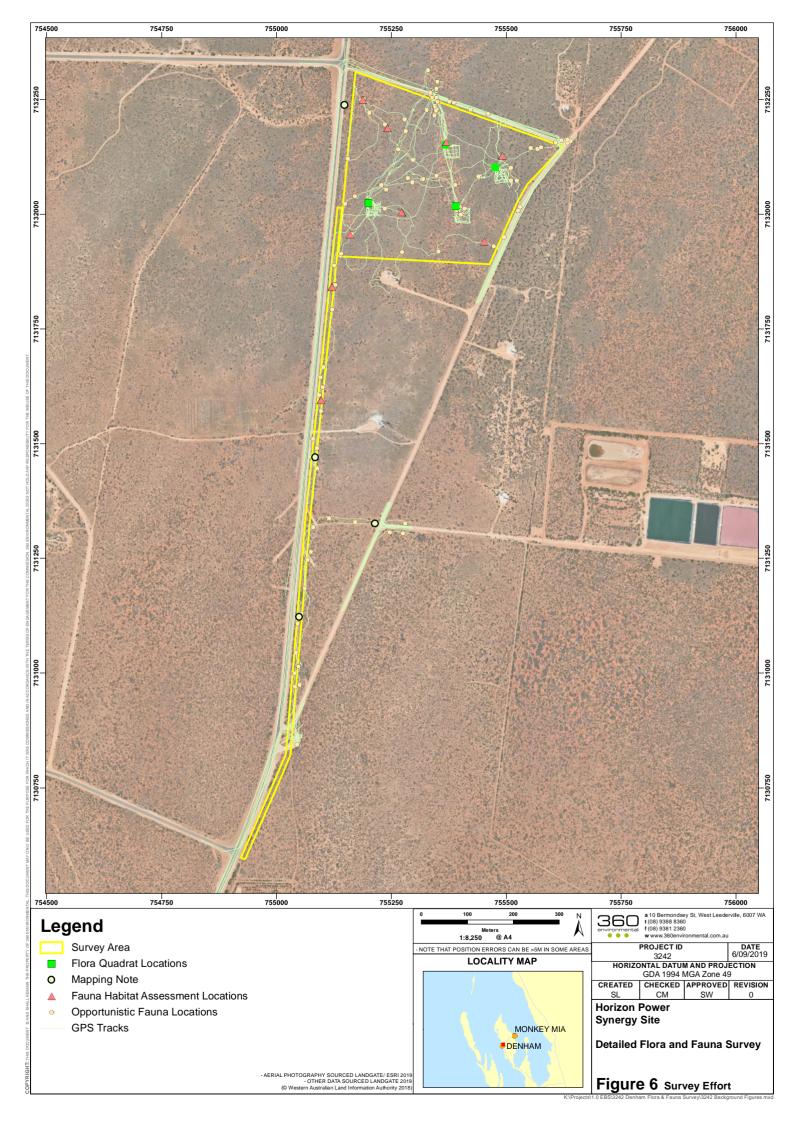
Malleefowl (*Leipoa ocellata*) and Bilby (*Macrotis lagotis*) leave obvious evidence of current use, in the form of nesting mounds, tracks and signs of the birds (for Malleefowl)



and digging and tracks for Bilby. Therefore, search transects were undertaken throughout the Survey Area, searching for any signs of the species.

# 3.4.6 Taxonomy

Where there was doubt on species names identified in the desktop assessment (through subsequent name changes or taxonomic reviews), an effort was made to determine the current scientific name for each taxon. Taxonomy and nomenclature in this report follows the WA Museum checklist 2019 (Western Australian Museum, 2019) where relevant.





# 4 Results

# 4.1 Limitations

Limitations and constraints of the flora, vegetation and fauna survey are detailed below in Table 4.

Table 4: Limitations and Constraints Associate with the Survey

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Availability of	Not a	All data required to complete the scope of works including
Data	limitation	regional and local contextual information was available
Access and	Not a	The Survey Area was able to be accessed by vehicle and on
Survey	limitation	foot. The survey effort is displayed in Figure 6.
Intensity		
Experience	Not a limitation	The flora and vegetation survey was undertaken by Principal Botanist Catherine Krens and Ecologist Colleen McDonald. Catherine has 20 years' experience conducting surveys of similar scope throughout Western Australia, including the Shark Bay region. Colleen has worked as an environmental consultant for two years and has completed flora, vegetation and fauna surveys state-wide.  The fauna survey was undertaken by Senior Ecologist Andrew Hide. Andrew has over 12 years' experience conducting fauna surveys of similar scope throughout Western Australia, including the Shark Bay region.  Taxonomy was undertaken by experienced Taxonomist Udani Sirisena at the WA herbarium. Specialist taxonomists were consulted regarding specimens of interest, this included R. Davis and T. McFarlane.
Timing, weather, season	Moderate Limitation	The recommended primary survey period for the region as per the EPA Technical Guidance, occurs 6 – 8 weeks post wet season (March – June). However, during the 2019 wet season the region experienced little to no rainfall.  Consequently, because there was no break in season the survey was not undertaken during the recommended primary survey period.  Instead the survey was undertaken in July 2019 (during the dry season), six weeks after a significant rainfall event (60.4 mm recorded between 7 June and 9 June 2019). This is considered adequate conditions for a supplementary survey timing for the Eremaean Botanical Provenance (Environmental Protection Authority, 2016a).



Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
		Despite being able to complete the survey during a recommended supplementary survey period the area still received below average rainfall for the period leading up to the survey, and this was still not able to be completed during the recommended primary survey period. Therefore, this is considered a moderate limitation of the survey.
Life forms sampled	Moderate limitation	The Survey Area was traversed by foot and all remnant vegetation was surveyed. All dominant flora species were recorded within the vegetation units. Of the 59 flora taxa collected, 9 (15%), were unable to be identified to species level due to the absence of identifiable features such as fruit and flowers. Therefore, this is considered a moderate limitation of the survey.  All observable fauna species were identified and recorded, and adequate fauna habitat assessments were completed for the size of the Survey Area.
Completeness	Not a limitation	The survey was considered complete for a detailed flora and vegetation survey, all vegetation types were surveyed and delineated within the Survey Area and a minimum of three quadrats was surveyed for each vegetation type.  The survey was considered complete for a level 1 vertebrate fauna survey, with fauna habitat assessments being completed throughout the Survey Area, adequate records of opportunistic fauna, and sampling effort for any potential conservation significant fauna species that may occur within the Survey Area.

# 4.2 Literature Review

The following reports were reviewed as part of the Literature Review.

# Shark Bay Biological Survey: Flora, Vegetation and Fauna Assessment (360 Environmental Pty Ltd, 2018)

360 Environmental was comissioned by Main Roads to undertake a biological survey of potential material extraction areas near Shark Bay and Exmouth, which included a single season flora and vegetation assessment and level 1 vertebrate fauna assessment. The survey comprised three separate areas located within Shark Bay, the closest was located on Shark Bay Road 42 km south/southeast of the Survey Area, and the remaining two were located on Useless Loop Road approximately 80 km south of the Surey Area.

• Four DBCA listed Priority flora species were recorded including: Olearia occidentissima (P2), Lepidium biplicatum (P3), Melaleuca huegelii subsp. pristicensis (P3) and Corchorus congener (P3)



- The African Boxthorn (\*Lycium ferocissimum), listed as a WONS was recorded from five locations
- The level 1 vertebrate fauna survey involved three separate Survey Areas in Shark Bay
- No fauna of conservation significance was recorded during the survey (other than a Marine listed Common Tern), however a Malleefowl was observed opportunistically during the vertebrate fauna survey along Useless Loop road.

Flora and Vegetation in the Proposed Coburn Mineral Sand Mine, Hamelin and Meadow Stations, Shark Bay (Mattiske Consulting Pty Ltd, 2005) – Located 84 km southeast of the Survey Area

Mattiske Consulting Pty Ltd was commissioned by URS Australia Pty Ltd to undertake a level 2 flora and vegetation survey in Coburn, Hamelin and Meadow Stations near Shark Bay.

Eighteen natural vegetation communities were mapped within the Survey Area. No TEC or PECs were identified. Nine Priority flora taxa were recorded; Acacia subrigida, A. drepanophylla, Eremophila occidens, Grevillea rogersoniana and G. stenostachya, Jacksonia dendrospinosa, Macarthuria intricata, Physopsis chrysophylla and Scholtzia sp. Folly Hill.

Vertebrate Fauna Survey Coburn Mineral Sand Project (Ninox Wildlife Consulting, 2005) – Located 84 km southeast of the Survey Area

Ninox Wildlife Consulting was commissioned by URS Australia Pty Ltd to undertake a Level 2 vertebrate fauna survey in Coburn, Hamelin and Meadow Stations near Shark Bay.

The level 2 vertebrate fauna survey comprised three separate surveys undertaken in September 2003, April 2004 and October 2004 and involved 19 sampling locations, located 84 km southeast of the curent Survey Area. Malleefowl was detected during the survey.

No other fauna of conservation significance was recorded during the three surveys.

Public Environmental Review Coburn Mineral Sand Mine (URS Australia Pty Ltd, 2005) – Located 84 km southeast of the Survey Area

The report provides additional information relevant to the above mentioned reports.

Project Eden Fauna Recovery on Peron Peninsula, Shark Bay: Western Shield (Morris et al., 2004) – Located 5 to 30 km north of the Survey Area

A number of native fauna reintroductions were undertaken by the then Department of Parks and Wildlife (now DBCA), as part of Project Eden. The reintroductions occurred within Francois Peron National Park, approximately 10 – 40 km north of the Survey Area.

The species that were reintroduced included Malleefowl (Leipoa ocellata), Woylie (Bettongia penicillata), Greater bilby (Macrotis lagotis), Banded hare-wallaby



(Lagostrophus fasciatus), Rufous hare-wallaby (Lagorchestes hirsutus) and Quenda (Isoodon obesulus).

Only two of the six species established viable populations in the Malleefowl and Bilby.

Vegetation and Rare Flora Surveys Concept Development Plan Areas Monkey Mia Dolphin Resort, Shire of Shark Bay (Weston, 2002)

During the survey no Declared Rare or Priority flora species were recorded in either study area. The study area is located 20 km northeast of the current Survey Area.

# 4.3 Flora and Vegetation

#### 4.3.1 Desktop Assessment

The desktop assessment identified 37 conservation significant species occurring within 50 km of the Survey Area. This included:

- One Threatened species
- Five Priority 1 species
- 14 Priority 2 species
- 14 Priority 3 species
- Three Priority 4 species.

A full description of all conservation significant species identified in the Desktop Assessment is provided in Appendix A and their locations are mapped in Figure 7.

The desktop assessment identified one Priority Ecological Community listed by the State occurring within 20 km of the Survey Area (Figure 8). The Hypersaline microbial community number 2 is listed as a Priority 1 under the State legislation however the PEC is not listed under the EPBC Act.

#### 4.3.2 Likelihood of Occurrence

The conservation significant species identified in the Desktop Assessment were reviewed for their likelihood of occurrence within the Survey Area based on the criteria outlined in Table 3. Of the 37 species identified in the desktop assessment, three species were recorded or potentially recorded within the Survey Area, nine species are considered to have a high likelihood of occurrence, 12 are considered to have a medium likelihood of occurrence and 13 are considered to have a low likelihood of occurrence. The likelihood assessment is displayed in Table 5.

Priority species identified as having been recorded or potentially recorded in the Survey Area include:

- Acanthocarpus aff. rupestris (P2)
- Olearia ?occidentissima (P2)



• Triodia plurinervata (P3).

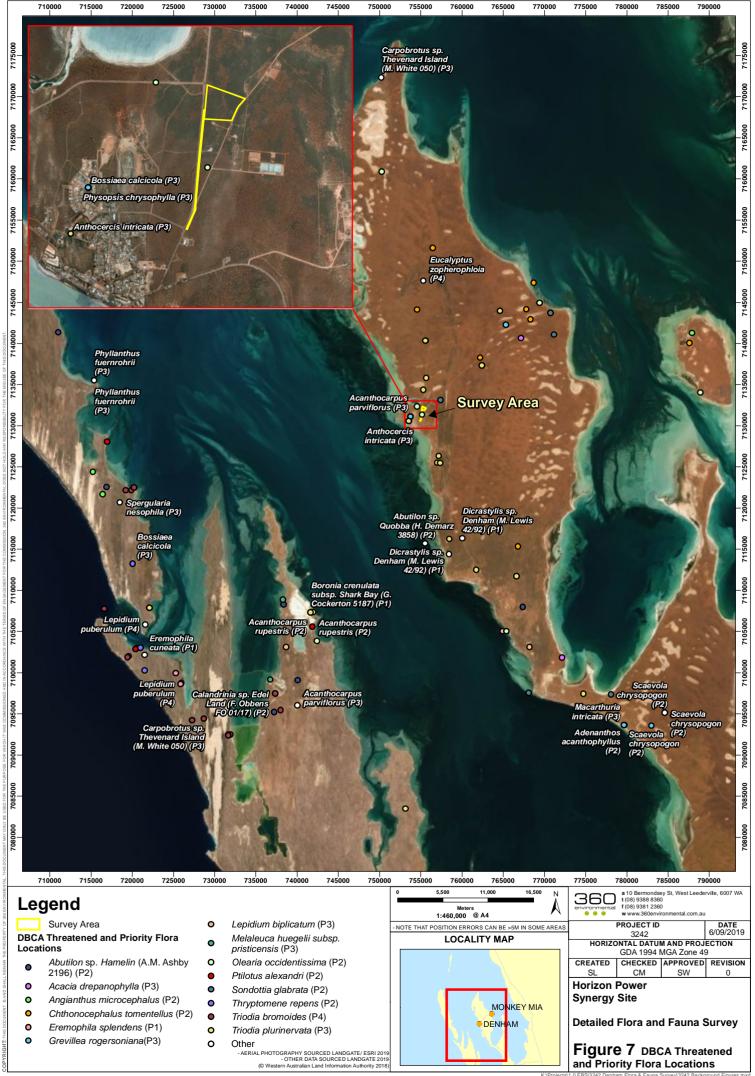
Priority species identified as having a high likelihood of occurrence in the Survey Area include:

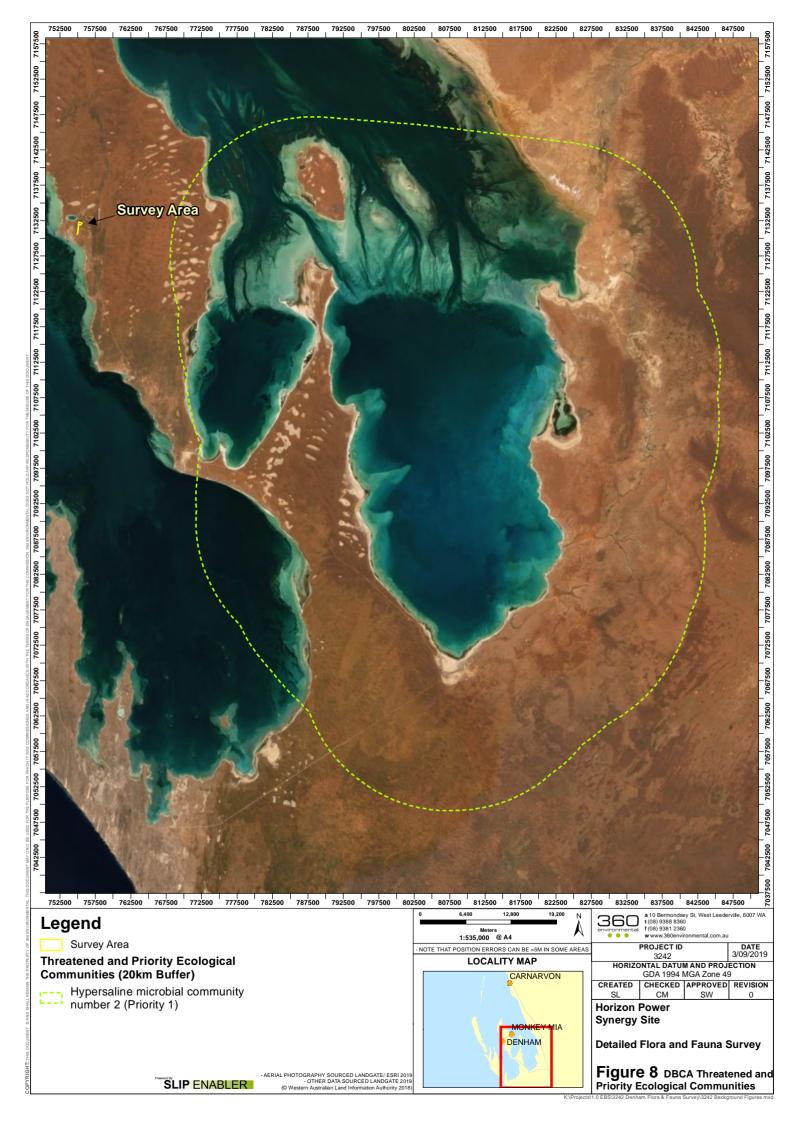
- Abutilon sp. Hamelin (A.M. Ashby 2196) (P1)
- Chthonocephalus muellerianus (P2)
- Chthonocephalus tomentellus (P2)
- Melaleuca oldfieldii (P2)
- Acanthocarpus parviflorus (P3)
- Anthocercis intricata (P3)
- Bossiaea calcicola (P3)
- Grevillea rogersoniana (P3)
- Physopsis chrysophylla (P3).

Priority species identified as having a medium likelihood of occurrence in the Survey Area include:

- Eucalyptus beardiana (T, VU)
- Eremophila splendens (P1)
- Abutilon sp. Quobba (H. Demarz 3858) (P2)
- Adenanthos acanthophyllus (P2)
- Ptilotus alexandri (P2)
- Scaevola chrysopogon (P2)
- Thryptomene repens (P2)
- Lepidium biplicatum (P3)
- Macarthuria intricata (P3)
- Melaleuca huegelii subsp. pristicensis (P3)
- Phyllanthus fuernrohrii (P3)
- Triodia bromoides (P4).

The remaining 14 species were considered to have a low likelihood of occurrence in the Survey Area.





#### Table 5: Flora Likelihood of Occurrence

Closest record to Survey Area based on DBCA 2019. High = Suitable habitat present and records less than 15 km from the Survey Area, Medium = Suitable habitat present and records between 15 km and 50 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 50 km from the Survey Area. CR = Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = Listed as Vulnerable under the EPBC Act.

		ion Status		Source	,	Distance to		CAct, VU = Listed as Vulnerable under the EPBC Act .	Habitat occurs	
Species	DBCA	EPBC	NatureMap	EPBC	DBCA	Nearest Record (km)	Flowering Period	Prefered Habitat	within the Survey Area	Likelihood of Occurrence
Eucalyptus beardiana	Т	VU		Х		66.4	Aug to Sep	Red or yellow sand. Sand dunes & ridges.	Yes	Medium
Boronia crenulata subsp. Shark Bay (G. Cockerton	P1	-			Х	26.8	Aug	Limestone. Outcrop.	No	Low
Dicrastylis sp. Denham (M. Lewis 42/92)	P1	-	Х		Х	15.2	-	Grey Sand.	No	Low
remophila cuneata	P1	-			Х	43.9	-	Below limestone outcrop.	No	Low
Eremophila splendens	P1	-			Х	42.7	Sep	Creamy brown calcareous sand. Slopes, lowland	Yes	Medium
Grevillea sp. Shark Bay (N.H. Speck 24/09/1953)	P1	-	X		Х	1.3	Unknown	Unknown	-	Low
Abutilon sp. Hamelin (A.M. Ashby 2196)	P2	-	X		Х	1.4	Jul to Sep	Sand or loam. Limestone rises.	Yes	High
Abutilon sp. Quobba (H. Demarz 3858)	P2	-	Х		Х	15.0	Jul to Sep	Sandplain, brown clayey sand or rock.	Yes	Medium
Acanthocarpus rupestris	P2	-			Х	28.2	May to Jun	Red sand, limestone.	Yes	Recorded
Adenanthos acanthophyllus	P2	-			Х	44.5	Apr to Jul or Dec	Red or orange-brown sand.	Yes	Medium
Angianthus microcephalus	P2	-			X	33.5	Sep to Dec	Sandy or clayey soils. Salt swamps &andpans.	No	Low
Calandrinia sp. Edel Land (F. Obbens FO 01/17)	P2	-			Х	39.5	-	Rocky limestone outcrop on hilltop. Grey brown sandy loam in rock cracks etc. over limestone.	No	Low
Chthonocephalus muellerianus	P2	-	X		Х	1.3	Sep	Red sand.	Yes	High
Chthonocephalus tomentellus	P2	-	Х		Х	9.0	Aug to Nov	Red sand. Undulating plains, sand dunes, near saline depressions.	Yes	High
Melaleuca oldfieldii	P2	-	Х			2.3	Aug or Oct to Dec	Red or brown sand over sandstone or limestone, sandy clay.	Yes	High
Olearia occidentissima	P2	-	X		Х	0.1	Jul to Sep	Shallow soils. Coastal limestone cliffs.	Yes	Possibly Recorded
Ptilotus alexandri	P2	-			Х	28.2	Aug to Oct	Red-white sand. Dunes.	Yes	Medium
Scaevola chrysopogon	P2	-			Х	44.5	Aug to Oct	Red/brown sand. Sandplains.	Yes	Medium
Sondottia glabrata	P2	-	Х		Х	2.0	Sep to Oct	Saline flats.	No	Low
Thryptomene repens	P2	-			Х	39.0	-	High part of dune; creamy-brownish calcareous sand.	Yes	Medium
Acacia drepanophylla	P3	-	Х		Х	14.3	May to Jul	Red clay or loam over limestone. Flat to undulating plains. low rises.	No	Low
Acanthocarpus parviflorus	P3	-	X		X	1.3	May to Jun	Sand over limestone or sandstone.	Yes	High
Anthocercis intricata	P3	-	Х		Х	1.4	Jun to Sep	Sand or loam over limestone. Consolidated sand dunes.	Yes	High
Bossiaea calcicola	P3	-	Х		Х	1.3	Jul to Sep	Compacted sand over limestone. Exposed sites on coastal cliffs and slopes.	Yes	High
Carpobrotus sp. Thevenard Island (M. White 050)	P3	-			Х	40.3	Aug	Coarse white sand. Dune tops, disturbed areas.	No	Low
Grevillea rogersoniana	P3	-	Х		Х	1.3	Aug to Oct	Red sand.	Yes	High
Lepidium biplicatum	P3	-	Х		Х	19.0	Sep	Coastal regions.	Yes	Medium
Macarthuria intricata	P3	-			Х	44.5	Sep to Dec	Red or black soil over limestone, grey sand over sandstone, sandy clay. Sandplains & sand dunes.	Yes	Medium
Melaleuca huegelii subsp. pristicensis	P3	-			Х	26.8	Sep to Oct	Sand.	Yes	Medium
Phyllanthus fuernrohrii	P3	-			Х	39.8	-	Red soil over limestone.	Yes	Medium
Physopsis chrysophylla	P3	-	Х		Х	1.3	Sep to Dec or Jan	Red or yellow sandy soils. Sandplains.	Yes	High
Spergularia nesophila	P3	-			Х	37.8	-	Brown guano soil over limestone rock. Rock platform off high rock island.	No	Low
Stenanthemum divaricatum	P3	-	Х		Х	1.3	-	White or yellow sand over sandstone.	No	Low
Triodia plurinervata	P3	-	Х		Х	1.4	May to Jul or Sep to Oct	Red to orange-brown sand, limestone, sandy loam. Sand dunes & steppes, often coastal areas, drainage basins, salt lakes.	Yes	Recorded
Eucalyptus zopherophloia	P4	-	Х		Х	15.3	Oct to Dec or Jan	Grey/white sand with limestone rubble. Coastal areas.	No	Low
Lepidium puberulum	P4	-			Х	41.5	Jul to Aug or Oct to Nov	Sandy soils.	No	Low
Triodia bromoides	P4	-			Х	35.7	Jul to Oct	Red, grey and calcareous sand. Dunes, sandplains, stony rises.	Yes	Medium



#### 4.3.3 Flora

The survey recorded a total of 59 taxa from 45 genera across 26 families. The most dominant families were Asteraceae (six species), Fabaceae (six species) and Chenopodiaceae (six species) and the most dominant genera was *Acacia* (three species). A full species inventory is detailed in Appendix B.

A specimen was collected for all species recorded within the Survey Area. A large proportion of flora, 9 taxa (15%), were unable to be identified confidently to species level. This was mainly due to the specimens being sterile with no flowering material or fruit present.

All recorded flora was common to the Carnarvon region and none of the flora represented a population range extension.

### 4.3.4 Flora of Conservation Significance

The targeted flora survey focused on areas of suitable habitat for species with a medium or high likelihood of occurrence within the Survey Area (Table 5).

No Threatened flora species pursuant to the *EPBC* Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the *BC* Act 2016 were recorded during the survey.

Two Priority species as listed by DBCA (*Acanthocarpus* aff. *rupestris* (P2) and *Triodia plurinervata* (P3)) were recorded within the Survey Area and one potential Priority species (*Olearia? occidentissima* (P2)) was recorded within the Survey Area. Each of these three species were recorded in all four quadrats across the Survey Area.

### 4.3.5 Introduced Flora

A total of five introduced species were recorded or potentially recorded within the Survey Area, representing 8.6% of the total taxa recorded (Table 6). None of these are listed as Declared Pests under the Bam Act (Department of Primary Industries and Regional Development, 2018). One species, \*Lycium ferocissimum is listed as a WONS (Department of Energy and Environment, 2018).

Table 6: Introduced Flora Species within the Survey Area

Species	Common Name	Status under BAM Act	WONS
*Hypochaeris glabra	Smooth Cats-ear	Permitted – s11	No
*Lycium ferocissimum	African Boxthorn	Permitted – s11	Yes
*Sonchus oleraceus	Common Sowthistle	Permitted – s11	No
?*Sisymbrium erysimoides	Smooth Mustard	Permitted – s11	No
?*Urospermum picroides	False Hawkbit	Permitted – s11	No



# 4.3.6 Vegetation Types

A total of three vegetation types were mapped within the Survey Area. These consisted of:

- AlTdTp= Triodia Hummock Grassland (13.87 ha)
- AlCrAp = Acacia Shrubland (0.13 ha)
- AlTdAp = Myrtaceae Low Shrubland (0.74 ha).

The vegetation units are described in Table 7 and mapped in Figure 9. Detailed site sheets for each quadrat are provided in Appendix C.



Table 7: Vegetation Types Occurring within the Survey Area

	tation Typ	bes Occurring within the Survey Area		
Broad Floristic Formation		Vegetation Unit	Sites	Photograph
Triodia Hummock Grassland	AlTdTp	Mid Open Shrubland of Acacia ligulata and Exocarpos aphyllus over a Low Open Shrubland of Chorizema racemosum,  Melaleuca eulobata and Thryptomene dampieri over a Low Open Hummock Grassland of Triodia plurinervata.  Representation in the Survey Area: 13.87 ha; 93.63%	Q01, Q02, Q03, Q04, MN04	
Acacia Shrubland	AlCrAp	Mid Sparse Shrubland of Acacia ligulata over Low Sparse Shrubland of Chorizema racemosum and Stylobasium spathulatum, Low Sparse Chenopod Shrubland over Atriplex paludosa.  Representation in the Survey Area: 0.13 ha; 0.90%	MN02, MN03	



Broad Floristic Formation	AITdAp Mid Sparse Shrubland of Acacia ligulata and Exocarpos aphyllus over a Low Open Shrubland of Acacia tetragonophylla, Scaevola spinescens and Thryptomene dampieri over a Low Sparse Chenopod Shrubland of Atriplex paludosa and Rhagodia latifolia.  Representation in the Survey Area: 0.74 ha; 4.97%		Sites	Photograph
Myrtacaeae Low Shrubland	ristic nation  Caeae AITdAp Mid Sparse Shrubland of Acacia ligulata and Exocarpos over a Low Open Shrubland of Acacia tetragonophylla, Scaevola spinescens and Thryptomene dampieri over a Sparse Chenopod Shrubland of Atriplex paludosa and Rhagodia latifolia.  Representation in the Survey Area: 0.74 ha; 4.97%  Track Cleared existing track.		MN01	
Track	Track	Cleared existing track. Representation in the Survey Area: 0.07 ha; 0.50%	-	-



## 4.3.7 Vegetation Condition

Vegetation condition within the Survey Area ranged from Excellent to Completely Degraded. The majority of the Survey Area was in Excellent condition (81.46%). Disturbances included litter and weeds. In summary, condition across the Survey Area consisted of:

Excellent: 12.07 ha, 81.46%

Very Good: 2.65 ha, 17.88%

• Good: 0.03 ha, 0.21%

• Completely Degraded (cleared areas): 0.07 ha, 0.45%

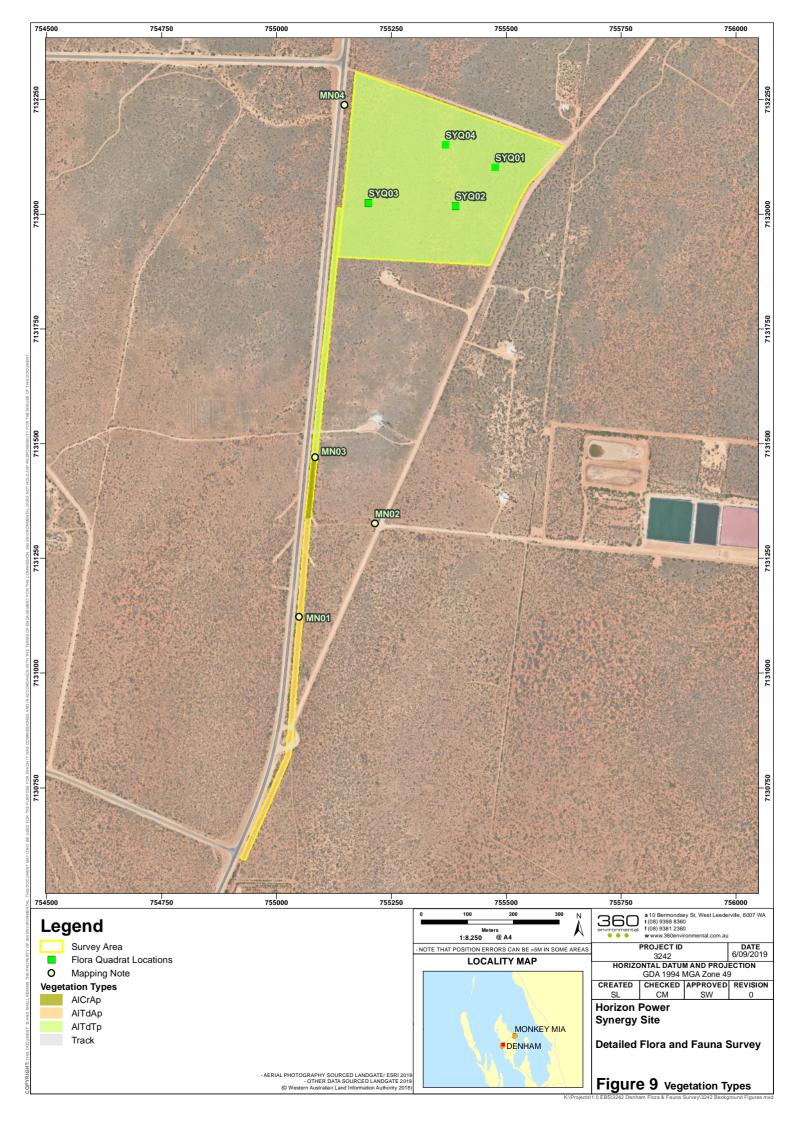
The vegetation condition is mapped in Figure 10.

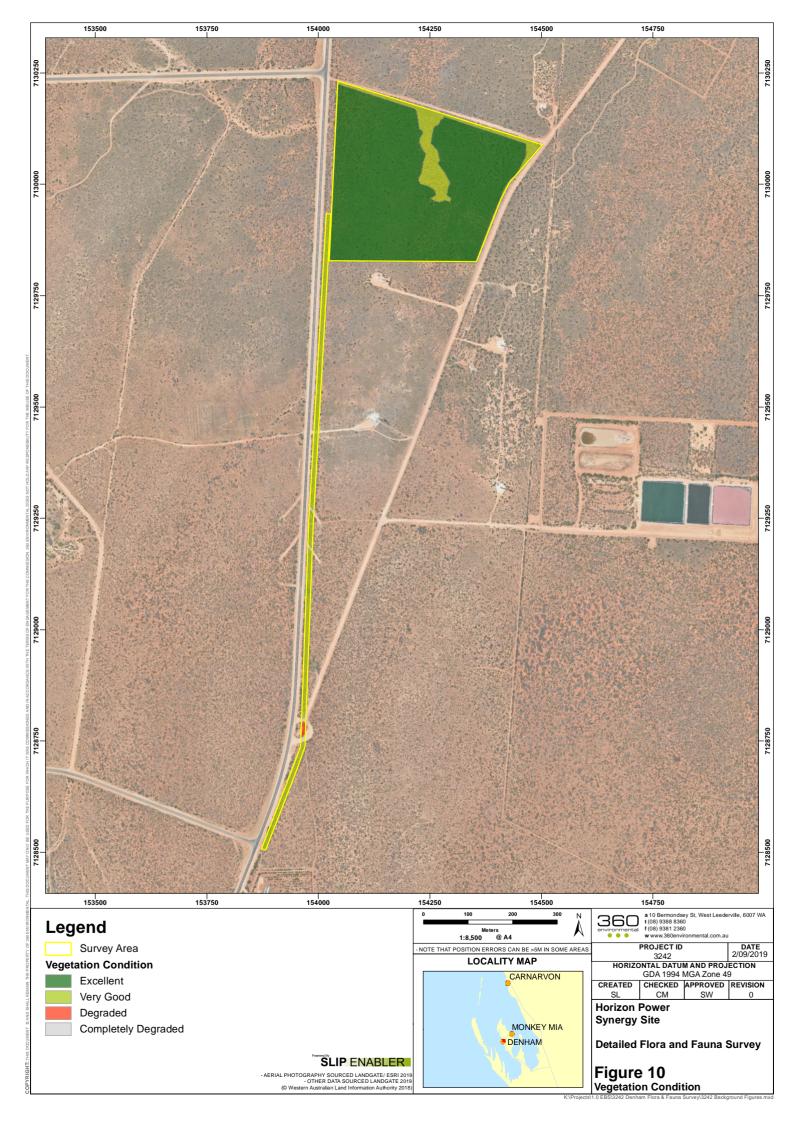
## 4.3.8 Threatened and Priority Ecological Communities

No Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) were present within the Survey Area.

# 4.3.9 Regional Representation

Vegetation mapping units described in the Survey Area were correlated with the Beard (1976) and Shepherd et al. (2002) broad vegetation types by examining similarities in vegetation descriptions. Differences exist with the terminology used in the descriptions as they are based on different methods of categorising and characterising vegetation types, and the different spatial scale of the analysis (i.e. region vs. local scale). Vegetation type AITdTp is considered to be representative of the Perron 112 vegetation types which includes 93.63 % of the Survey Area.







# 4.4 Vertebrate Fauna Results

## 4.4.1 Desktop Assessment

A total of 213 vertebrate fauna species were retrieved from the database searches. Of these, 37 are conservation significant vertebrate fauna species (including Priority species) from 15 families.

The results of the DBCA fauna database search are displayed in Figure 11 and the results of all database searches are presented in Appendix A.

The following are a summary of the key findings from the fauna database searches:

- 134 bird species have been previously recorded in the surrounding area, including 31 species of conservation significance
- 14 mammal species have been previously recorded in the surrounding area, including three species of conservation significance
- 65 reptile species have been previously recorded in the surrounding area, including three species of conservation significance
- No amphibian species have been previously recorded in the surrounding area, and therefore there are no species of conservation significance.

Species listed as Marine only under the EPBC Act, such as the Black-faced Cuckoo-shrike (Coracina novaehollandiae), Rainbow Bee-eater (Merops ornatus), Australian Kestrel (Falco cenchroides) etc, as well as marine dependent species including the Dugong (Dugong dugon), Dolphin spp. and Albatross spp. have been excluded from the likelihood of occurrence list as there is no marine habitat present within the Survey Area.

#### 4.4.2 Field Survey

A total of 40 terrestrial vertebrate fauna species from 29 families were recorded during the field survey (19 of which were recorded outside of the Survey Area), comprised of:

- 26 bird species from 18 families
- 10 mammal species from eight families
- Six reptiles from three families.

A full systematic fauna species list is presented below in Table 8, which lists the total count of species records (providing a rough indication of abundance), and conservation status. Species recorded outside the Survey Area were all observed within 2 km of the Survey Area.

A total of seven introduced fauna species were recorded within the Survey Area (all mammals). Seven Marine Listed species were recorded.



Table 8: Fauna Species Recorded During the Field Survey

Family	Scientific Name	Common Name		ervation tatus		ey Area ount
			State	Federal	Inside	Outside
		Aves				
Acanthizidae	Sericornis frontalis	White-browed Scrubwren			-	4
Accipitridae	Aquila audax	Wedge-tailed Eagle			-	1
Accipitridae	Haliaeetus leucogaster	White-bellied Sea-Eagle		MA	-	2
Anatidae	Anas gracilis	Grey Teal			-	20
Anatidae	Tadorna tadornoides	Australian Shelduck (Mountain Duck)			-	3
Cacatuidae	Cacatua roseicapilla	Galah			6	20
Campephagidae	Coracina novaehollandiae	Black-faced Cuckoo- shrike		MA	-	2
Columbidae	Spilopelia senegalensis	Laughing Turtle-Dove			-	5
Corvidae	Corvus bennetti	Little Crow			-	2
Corvidae	Corvus orru	Torresian Crow			-	1
Dromaiidae	Dromaius novaehollandiae	Emu			11	32
Estrildidae	Taeniopygia guttata	Zebra Finch			9	14
Falconidae	Falco berigora	Brown falcon			1	
Falconidae	Falco cenchroides	Australian Kestrel (Nankeen Kestrel)		MA	-	4
Hirundinidae	Hirundo neoxena	Welcome Swallow			-	34
Hirundinidae	Petrochelidon nigricans	Tree Martin		MA	-	21
Laridae	Larus novaehollandiae	Silver Gull		MA	-	5
Maluridae	Malurus lamberti	Variegated Fairy-wren			3	24
Maluridae	Malurus leucopterus	White-winged Fairy-wren			12	24
Meliphagidae	Gavicalis virescens	Singing Honeyeater			21	15
Pelecanidae	Pelecanus conspicillatus	Australian Pelican		MA	-	1
Pomatostomidae	Pomatostomus superciliosus	White-browed Babbler			-	5
Psophodidae	Psophodes occidentalis	Western Wedgebill (Chiming Wedgebill)			1	9
Recurvirostridae	Himantopus himantopus	Black-winged Stilt		MA	-	2
		Mammalia	I			
Bovidae	Capra hircus	Goat *			3	8
Canidae	Canis familiaris dingo	Dingo, Dog *			4	5
Canidae	Vulpes vulpes	Red Fox *			3	2
Equidae	Equus caballus	Horse *			-	2
Felidae	Felis catus	Cat *			-	7



Family	dae Oryctolagus cuniculus Rabbit *  Osphranter robustus erubescens  ne Mus musculus House Mouse *  ne Notomys alexis alexis Spinifex Hopping-mon glossidae Tachyglossus aculeatus acanthion  Reptilia  Ctenophorus maculatus maculatus Delma sp.  Cryptoblepharus plagiocephalus  dae Lerista sp.  Morethia butleri /	Common Name		ervation tatus	Survey Area Count			
			State	Federal	Inside	Outside		
Leporidae	Oryctolagus cuniculus	Rabbit *			7	32		
Macropodidae	erubescens Euro				11	27		
Muridae	Mus musculus	House Mouse *			1	4		
Muridae	Notomys alexis alexis	Spinifex Hopping-mouse			3	11		
Tachyglossidae	Tachyglossus Short heaked Echidae				4	5		
		Reptilia						
Agamidae		Spotted Military Dragon			5	23		
Pygopodidae	Delma sp.	Delma sp.			1			
Scincidae		Peron's Snake-eyed Skink			2	2		
Scincidae					-	8		
Scincidae	1	Morethia			1			
Scincidae	Tiliqua rugosa palarra	Bobtail			1	2		

<sup>\*</sup> Introduced species

MA = Marine Listed Species

# 4.4.3 Fauna Habitat

A total of nine fauna habitat assessments were undertaken during the field survey, with three fauna habitat types identified and mapped (Figure 12, Appendix D), which includes Acacia Shrubland, over *Triodia*, Acacia Shrubland (*Triodia* absent) and Cleared/Completely Degraded. The extent of fauna habitats within the Survey Area are presented in Table 9 and a description and photo for each are presented in Table 10.

Table 9: Fauna Habitat Types and Extent within the Survey Area

Fauna Habitat	Extent within Survey Area					
ταιτα πασιτατ	Area (ha)	%				
Acacia Shrubland, over Triodia	7.05	91.2				
Acacia Shrubland	0.66	8.5				
Cleared/Completely Degraded	0.02	0.3				
Total Area	947	100				



Table 10: Fauna Habitat Type Descriptions with the Survey Area

Fauna Habitat	Vegetation Type Code	Fauna Habitat Description and Fauna Value	Representative Photo
<i>Acacia</i> Shrubland, over <i>Triodia</i>	AlTdTp	Acacia Open Shrubland, over Melaleuca, Thryptomene, Chorizema and mixed shrubs, over Triodia. This fauna habitat provides breeding and foraging refuge to fauna, particularly small terrestrial birds and reptiles, utilising the shrubs and Triodia for cover.	
Acacia Shrubland	AlCrAp AlTdTp	Acacia Open Shrubland, over Melaleuca, Thryptomene, Chorizema and mixed shrubs. This fauna habitat type is similar to the above, the primary difference being the absence of the Triodia, resulting in less foraging and refuge opportunities.	
Cleared/Completely Degraded	-	This fauna habitat type contains limited vegetation and has recently or previously been cleared or heavily disturbed. Provides low to no fauna value	



### 4.4.4 Conservation Significant Fauna

No fauna species of conservation significance (Threatened or Priority), or evidence of these species such as tracks, scats, nest, diggings, burrows or direct sightings were recorded within or directly surrounding the Survey Area.

Targeted searches for Malleefowl, Bilby and additional conservation significant species were undertaken by traversing the Survey Area (as displayed in Figure 6). These searches did not identify any evidence of any conservation significant species.

#### 4.4.4.1 Likelihood of Occurrence

The 37 conservation significant fauna species identified from the desktop assessment were further assessed for their likelihood of occurrence after the completion of the field survey (Table 11). The results determined that:

- No fauna species of conservation significance were recorded within the Survey Area
- Two conservation significant fauna species are considered to have a high likelihood of occurrence within the Survey Area, and includes:
  - Osprey (Pandion haliaetus) Migratory/Marine
  - o Western Grasswren (Amytornis textilis textilis) Priority 4.
- Eight conservation significant fauna species are considered to have a medium likelihood of occurrence within the Survey Area. This includes four marine/coastal birds, as well as the following three terrestrial species:
  - Pacific Swift (Apus pacificus) Migratory/Marine
  - o Malleefowl (Leipoa ocellata) Vulnerable
  - o Bilby (Macrotis lagotis) Vulnerable
  - Woma (Aspidites ramsayi) Priority 1 (South West Population)
- The remaining 27 conservation significant species are considered to have a low likelihood of occurrence.



#### TABLE 11: Fauna Likelihood of Occurrence

Key: STATE = Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Code, FEDERAL = Environmental Protection and Biodiversity Conservation Act 1999, A = Listed in Naturemap Search, B = EPBC Protected Matters Search, C = DBCA Threatened and Priority Fauna Search, D = Current Survey, # = Number of DBCA Records in Past 15 years

CR = Critically Endangered, EN = Listed as Endangered, VU = Listed as Vulnerable, IA = International Agreement, Mi = Listed as Migratory, CD = Conservation dependent fauna, OS = Other specially protected fauna under the WC Act, Ma = Listed as Marine under the EBPC Act, P = Listed as Priority by the DBCA.

			CONSERVA	TION CODES							LIKELIHOOD OF
FAMILY	SCIENTIFIC NAME	COMMON NAME	STATE	FEDERAL	Α	В	С	D	#	HABITAT PREFERENCE	OCCURRENCE
			AVIAN (N	MARINE / COA	STAL)	)	,				
Charadriidae	Charadrius leschenaultii	Greater Sand Plover	IA (& VU at subsp. level)	VU, MI & MA	Х	Х	х		9	Tidal flats, preferring sandy substrates where it mainly forages for small crustaceans. Roosts on beaches at high tide, usually in association with other small waders, but more tolerant of hot dry sand <sup>1</sup>	Low
Charadriidae	Charadrius mongolus	Lesser Sand Plover	EN & IA	EN, MI & MA	Х	Х			6	Tidal flats, tolerates muddy substrates¹	Low
Charadriidae	Pluvialis squatarola	Grey Plover	IA	MI & MA	Х		Х		10	Strictly coastal, restricted ot large tidal flat systems <sup>1</sup>	Low
Hydrobatidae	Oceanites oceanicus	Wilson's Storm Petrel	IA	MI & MA	Х				1	One of the world's most abundant sebirds. Circumpolar, breeding in summer mostly Antartic continent <sup>1</sup>	Low
Laridae	Sterna anaethetus	Bridled Tern	IA	MI & MA	Х		Х		1	Sea-tern of tropical and sub-tropical waters. Forages far offshore, alone or in loose flocks <sup>1</sup>	Low
Laridae	Sterna bergii	Crested Tern (Greater Crested Tern)	IA	MI & MA	Х				-	Coastal - ocean beahces, offshore islands, extending out to the deeper pelagic waters; inshore on estuaries, bays, harbours, coastal lagoons; inland on major rivers, occasionally on saline lakes, salt ponds near coast <sup>2</sup>	Medium
Laridae	Sterna caspia	Caspian Tern	IA	MI & MA	Х		Х		21	Occurs in sheltered coastal waters; also uses inland water bodies, including large rivers, fresh to saline lakes, reservoirs and temporary wetlands¹	Medium
Laridae	Sterna dougallii	Roseate Tern	IA	MI & MA			Х		-	Restricted to tropical and subtropical seas and coastlines, mainly associated with coral reefs and sparsely vegetated islands where colonies usually nests on beahes just above high water mark!	Medium
Laridae	Sterna hirundo	Common Tern	IA	MI & MA	Х				2	Migrant from N Asia breeding grounds, adults occur in Aust from Sept to April. Coastal foraging in near-shore waters from sheltered bays to beyond surf point 1	Medium
Pandionidae	Pandion haliaetus	Osprey		MI & MA	Х		X		5	Coastal waters and estuaries, beaches islets and reefs- but usually not far out to sea except on islets or exposed reefs. Follows major rivers and wetlands far inland from the coast to larger river pools, even to arid regionswhere large pools occur in gorges hundreds of kilometres inland <sup>2</sup>	High
Scolopacidae	Arenaria interpres	Ruddy Turnstone	IA	MI & MA	Х		Х		1	Broad range of coastal habitats, including tidal flats, ocean beaches and rocky shorelines <sup>1</sup>	Low
Scolopacidae	Calidris acuminata	Sharp-tailed Sandpiper	IA	MI & MA	Х		Х		1	Fresh or salt wetlands – muddy edges of lagoons, swaps, lakes, dams, soaks, sewage farms, temporary floodwaters <sup>2</sup>	Low
Scolopacidae	Calidris alba	Sanderling	IA	MI & MA	Х		Х		1	Ocean beaches and sandy tidal flats <sup>1</sup>	Low
Scolopacidae	Calidris canutus	Red Knot	IA (& VU at subsp. level)	EN, MI & MA	Х		Х		3	Restricted to coastal sites with extensive, firm tidal flats1	Low

<sup>1 = (</sup>Menkhorst et al., 2017), 2 = (Morcombe, 2003), 3 = (Wilson and Swan, 2017), 4 = (Van Dyck and Strahan, 2008)



			CONSERVA	TION CODES							LIKELIHOOD OF
FAMILY	SCIENTIFIC NAME	COMMON NAME	STATE	FEDERAL	Α	В	С	D	#	HABITAT PREFERENCE	OCCURRENCE
Scolopacidae	Calidris ferruginea	Curlew Sandpiper	VU & IA	CR, MI & MA	Х	Х	Х		2	Inter-tidal mudflats of estuaries, lagoons, mangrove channels; around lakes, dams, floodwaters, flooded	Low
Scolopacidae	Calidris ruficollis	Red-necked Stint	IA	MI & MA	Х		Х		13	saltbush surrounds of inland lakes <sup>2</sup> Diverse – tidal and inland on mudflats, salt marshes, beaches, salt fields, temporary floodwaters <sup>2</sup>	Low
Scolopacidae	Calidris tenuirostris	Great Knot	VU & IA	CR, MI & MA	Х	Х	Х		7	Restricted to large tidal-flat systems, typically follow tide edge when foraging. At high tide gather with other shore birds on beaches or open sites with a damp substrate <sup>1</sup>	Low
Scolopacidae	Limosa lapponica	Bar-tailed Godwit	IA (& VU at subsp. level)	MI (& VU or CR at subsp. level) & MA	Х		Х		17	Coastal sites with large tidal flats <sup>1</sup>	Low
Scolopacidae	Limosa limosa	Black-tailed Godwit	IA	MI & MA	Х		Х		5	Shallow inland wetlands and, specially before wet season rains begin, on coast. Prefer sites with muddy substrates¹	Low
Scolopacidae	Numenius madagascariensis	Far Eastern Curlew (Eastern Curlew)	VU & IA	CR, MI & MA	Х	Х	Х		1	Widespread but patchily distributed along coast, most numerous at sites with extensive tidal flats <sup>1</sup>	Low
Scolopacidae	Numenius phaeopus	Whimbrel	IA	MI & MA	Х		Х		1	Widespread along Australian coast, but more common in north, especially at sites with combination of large tidal flas and mangroves <sup>1</sup>	Low
Scolopacidae	Tringa brevipes	Grey-tailed Tattler	IA & P4	MI	Х	Χ	Х		8	Coastal in Australia, most numerous on large tidal flat systems, but some use rocky shorelines <sup>1</sup>	Low
Scolopacidae	Tringa cinerea	Terek Sandpiper	IA	MI & MA	Х		Х		1	Preferring large tidal-flat systems!	Low
Scolopacidae	Tringa glareola	Wood Sandpiper	IA	MI & MA	Х		Х		4	Uses freshwater wetlands, especially those with emergent sedges and taller fringing vegetation <sup>1</sup>	Low
Scolopacidae	Tringa hypoleucos	Common Sandpiper	IA	MI & MA	Х		X		15	Varied coastal and interior wetlands – narrow muddy edges of billabongs, river pools, mangroves, among rocks and snags, reefs or rocky beaches; avoids wide open mudflats. Perches on branches, posts, boats <sup>2</sup>	Low
Scolopacidae	Tringa nebularia	Common Greenshank	IA	MI & MA	Х		Х		16	Diverse inland and coastal spots. Away from the coast uses both permanent and temporary wetlands — billabongs, swamps, lakes, floodplains, sewage farms and salt works ponds, flooded irrigated crops. On the coast — uses sheltered estuaries and bays with extensive mudflats, mangrove swamps, muddy shallows of harbours and lagoons, occasionally rocky tidal ledges. Prefers wet and flooded mud and clay rather than sand²	Low
Scolopacidae	Tringa stagnatilis	Marsh Sandpiper	IA	MI & MA	Х				2	Shallow, fresh to brackish inland wetlands <sup>1</sup>	Low
			AVIA	(TERRESTRIA	L)		•	•	•		
Acanthizidae	Calamanthus campestris	Dirk Hartog Island Rufous Fieldwren	VU		Х	Х			-	Occurs in low, sparse to dense shrublands, from temperate to arid regions. Charactieristic of chenopod shrublands and samphire, also in Mallee heathlands and has been recorded in Triodia Grasslands and dwarff mangroves 1	Low
Apodidae	Apus pacificus	Pacific Swift (Fork-tailed Swift)	IA	MI & MA			Х		-	Low to very high airspace over varied habitat, rainforest to semi-desert <sup>2</sup>	Medium
Maluridae	Amytornis textilis textilis	Western Grasswren	P4		Х	Х			21	In the Shark Bay region, the species prefers Acacia shrubland with dense shrub clumps and lower recumbent shrubs in which foliage extends to the ground	High

<sup>&</sup>lt;sup>1</sup> = (Menkhorst et al., 2017), <sup>2</sup> = (Morcombe, 2003), <sup>3</sup> = (Wilson and Swan, 2017), <sup>4</sup> = (Van Dyck and Strahan, 2008)



			CONSERVA	TION CODES							LIKELIHOOD OF
FAMILY	SCIENTIFIC NAME	COMMON NAME	STATE	FEDERAL	Α	В	С	D	#	HABITAT PREFERENCE	OCCURRENCE
Megapodiidae	Leipoa ocellata	Malleefowl	VU	VU	Х	Х	Х		9	Unburned mallee and woodland with abundant litter and low scrub <sup>2</sup>	Medium
			N	AMMALIAN							
Dasyuridae	Dasyurus geoffroii fortis	Western Quoll, Chuditch	VU	VU	Х	Х	Х		1	Areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland	Low
Potoroidae	Bettongia penicillata ogilbyi	Brush-tailed Bettong, Woylie	CR	EN	Х	Х	Х		-	Restricted to three small wheatbelt reserves, all characterised by the presence thickets of the plant genus Gastrolobium <sup>4</sup>	Low
Thylacomyidae	Macrotis lagotis	Bilby, Dalgyte	VU	VU	×	×	Х		1	Variety of inland habitats including Mitchell Grass and stony downs country of cracking clays, desert sandplains and dune fields sometimes containing laterite, with hummock grassland and massive red earths with Acacia shrubland <sup>4</sup>	Medium
				REPTILIAN							
Pygopodidae	Pletholax gracilis edelensis	Keeled Legless Lizard (Shark Bay)	P3		Х	Х			-	Restricted to Edel Land Peninsula and Dirk Hartog Island, Shark Bay on dunes with Beach Spinifex (Spinifex longifolius) and brown loam supporting Triodia	Low
Pythonidae	Aspidites ramsayi	Woma	P1 (southwest population)		Х	Х			1	The Woma occurs within woodlands, heaths and shrublands, often with spinifex. It shelters mainly in abandoned monitor and mammal burrows and in soil cracks <sup>3</sup>	Medium
Scincidae	Egernia stokesii badia	Western Spiny-tailed Skink	VU	EN	Х	Х	Х		-	Occupies rock crevices and hollow timber in sw. interior of WA and on Dirk Hartog Is., Shark Bay <sup>3</sup>	Low

<sup>&</sup>lt;sup>1</sup> = (Menkhorst et al., 2017), <sup>2</sup> = (Morcombe, 2003), <sup>3</sup> = (Wilson and Swan, 2017), <sup>4</sup> = (Van Dyck and Strahan, 2008)



#### **DBCA Threatened and Priority Fauna Locations**

- Bilby, dalgyte, ninu (VU)
- Chuditch, western quoll (VU) 0
- Dirk Hartog Island rufous 0 fieldwren (VU)
- Keeled legless lizard (Shark 0 Bay) (P3)
- Malleefowl (VU)
- Western grasswren (P4)
- Western spiny-tailed skink (VU)
- Woma (southwest subpop.) (P1)
- Woylie, brush-tailed bettong (CR)
- Marine Birds

SLIP ENABLER





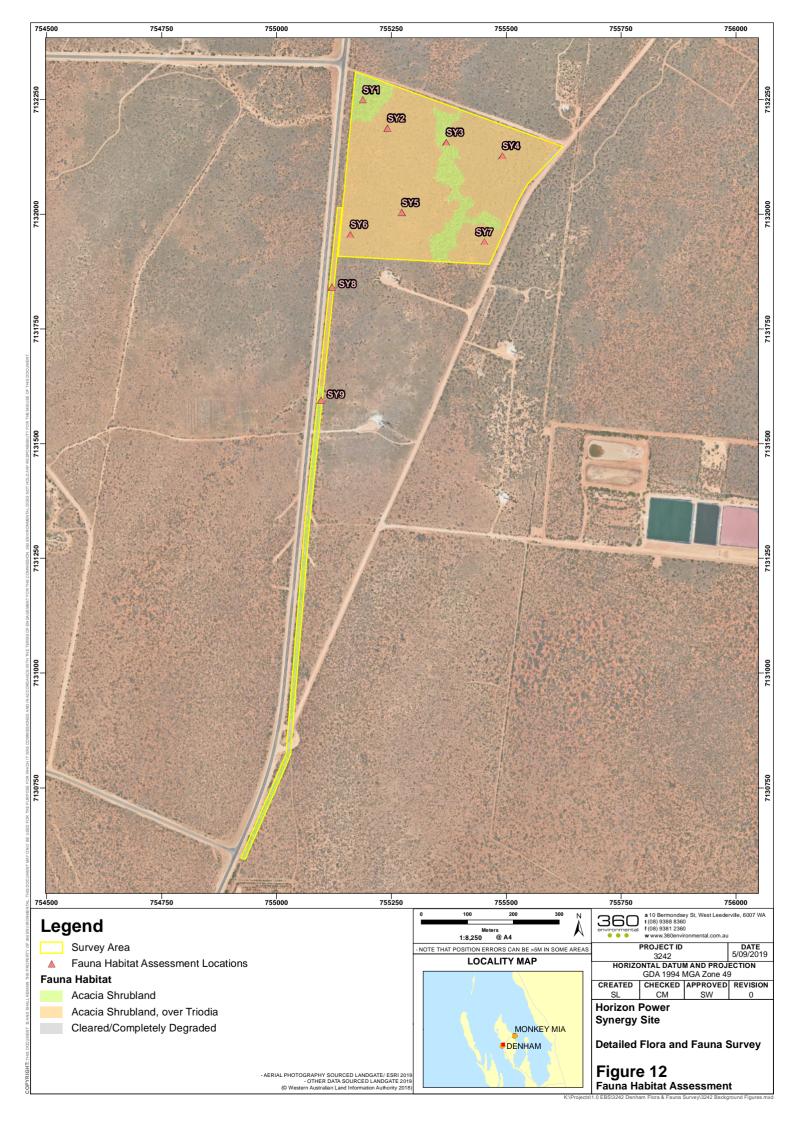
**DATE** 3/09/2019

HORIZONTAL DATUM AND PROJECTION GDA 1994 MGA Zone 49 CHECKED APPROVED REVISION CM SW

**Horizon Power** Synergy Site

**Detailed Flora and Fauna Survey** 

Figure 11 DBCA Threatened and Priority Fauna Locations





# 5 Discussion

# 5.1 Flora and Vegetation

#### 5.1.1 Flora

The suite of flora taxa recorded during the survey is considered typical for the respective areas (Beard 1976) and aligns with the database search results obtained. Despite the below-average rainfall recorded for the three months prior to commencing the survey, the floristic diversity was considered within the expected range for the bioregions for the timing of the survey undertaken. Despite a significant rainfall event occurred six weeks prior to the survey being undertaken where 60.4 mm was recorded over three consecutive days (7<sup>th</sup> to 9<sup>th</sup> June), the total rainfall for the three months and 12 months prior to the survey were 23.2 mm and 77.3 mm below the long term average for the same periods respectively. Due to the limited rainfall experienced in the area it is likely to have resulted in a lower species diversity and contributed to the considerable number of specimens that were unable to be identified due to the sterile nature of the specimens and is likely a major cause for recording lower herbaceous and annual species richness.

## 5.1.2 Flora of Conservation Significance

Conservation significant flora species identified in the desktop assessment with a medium and high likelihood of occurrence were targeted during the survey.

No Threatened flora species pursuant to the *EPBC* Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the *BC* Act 2016 were recorded during the survey. One species was identified as Threatened in the desktop assessment, *Eucalyptus beardiana*, was considered to have a medium likelihood of occurrence within the Survey Area.

The review of the database searches identified 36 Priority flora species as potentially occurring in the vicinity of the Survey Area.

Three species were identified as recorded or potentially recorded within the Survey Area. These are as follows:

- Acanthocarpus affinis rupestris (P2) was identified from the specimen collected during the survey. This specimen is described to be related to but not identical to Acanthocarpus rupestris the Priority 2 species. This species was recorded in all four quadrats, and although is not identified as the Priority it is considered to be of the same level of significance. There are two records of A. rupestris identified 28.2 km from the Survey Area. Due to the presence of this species in all quadrats it is considered to be present throughout the Survey Area.
- Olearia ?occidentissima (P2) was recorded in all four quadrats, although specimens
  were not identified completely to species level due to absence of complete flowering
  parts. O. occidentissima is a prostrate shrub ranging up to 0.2 m high. Flowers are



white or pink, occurring July to September (Department of Biodiversity Conservation and Attractions, 2019b). There are two confirmed records of this species within 1 km of the Survey Area and are shown in Figure 7. There are an additional seven records of the species identified between 1 and 33.3 km from the Survey Area. As there are several nearby records and an extensive area of suitable habitat, it is considered that O. occidentissima is present and in abundant across the site.

• Triodia plurinervata (P3) was recorded in abundance as the dominant species in the grassland strata of the AlTdTp vegetation type that is mapped to cover 13.87 ha of the Survey Area. T. plurinervata was recorded in all four quadrats surveyed. There are 21 records of T. plurinervata identified between 1.4 and 50 km of the Survey Area. This species was observed in abundance throughout the surrounds of the Survey Area.

Based on the habitat type present and known distribution, nine species have a high likelihood of occurrence within the Survey Area, these are as follows:

- Abutilon sp. Hamelin (A.M. Ashby 2196) (P1) is a shrub ranging from 0.08 to 0.5 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are yellow/orange and brown and occur from July to September. The closest record is 1.4 km from the Survey Area and an additional seven records have been identified within 50 km. Due to the survey being undertaken within the flowering period of the species it is considered that if the species were present within the Survey Area it would have been identified. However, due to the suboptimal rainfall of the site within the 12 months prior to the survey, the presence of suitable habitat and several nearby records it is considered the species may still have the potential to occur within the Survey Area.
- Chthonocephalus muellerianus (P2) is an annual herb species ranging from 0.02 to 0.07 m high and flowers during September (Department of Biodiversity Conservation and Attractions, 2019b). The closest record is 1.3 km from the Survey Area. No other records of the species have been identified within 50 km of the Survey Area. Due to the survey being undertaken outside the flowering period, the indistinct nature of the species and its existence as an annual species it is considered the species still has the potential to occur within the Survey Area.
- Chthonocephalus tomentellus (P2) is an herb species, flowering between August and November (Department of Biodiversity Conservation and Attractions, 2019b). The closest record is 9.0 km from the Survey Area and there are an additional seven records identified between 11 and 33 km from the Survey Area. Due to the survey being undertaken outside the flowering period, the indistinct nature of the species and its existence as an annual species, it is considered the species still has a high likelihood of occurrence within the Survey Area.



- Melaleuca oldfieldii (P2) is a spreading shrub species, ranging between 0.3 and 1.5 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are pink-purple or white and occur in August and October through December (Department of Biodiversity Conservation and Attractions, 2019b). The closest record is approximately 2.3 km from the Survey Area, however this record is has not been verified (Department of Biodiversity Conservation and Attractions, 2019c). Although the survey was undertaken outside the flowering period of this species, due to its distinct nature of Melaleuca species and size, it is considered that if the species were to exist within the Survey Area it would have likely been identified during the survey.
- Acanthocarpus parviflorus (P3) is perennial herb ranging between 0.15 to 0.4 m high (Department of Biodiversity Conservation and Attractions, 2019b). The species flowers are white and occur from May to June. The closet record is 1.3 km from the Survey Area. One other record of the species was identified 37.7 km from the Survey Area. Due to the perennial nature, size of the species, and the survey occurring within the flowering period it is considered that if the species were present within the Survey Area it would have likely been identified during the survey. However, due to the suboptimal rainfall of the area within the 12 months prior to the survey and the presence of suitable habitat it is considered the species may still have the potential to occur within the Survey Area.
- Anthocercis intricata (P3) is a dense, spinescent shrub ranging between 0.9 and 3 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are white-cream and occur June to September (Department of Biodiversity Conservation and Attractions, 2019b). The closest record is 1.4 km from the Survey Area and is the only record within 50 km. Due to the survey being undertaken within the flowering period and the distinct nature and size of the species it is considered that if the species were present within the Survey Area it would have likely been identified.
- Bossiaea calcicola (P3) is a spinescent shrub reaching up to 0.7 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are yellow-red and occur July to September (Department of Biodiversity Conservation and Attractions, 2019b). The closest record is 1.3 km from the Survey Area. One other record was identified 39.0 km from the Survey Area. Due to the survey being undertaken within the flowering period and the distinct nature and size of the species it is considered that if the species were present within the Survey Area it would have likely been identified.
- Grevillea rogersoniana (P3) is a many-stemmed shrub ranging between 1.0 and 8.0 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are red, pink and/or purple and occur August to October (Department of Biodiversity Conservation and Attractions, 2019b). There are ten individual records of the species identified 1.3 km from the Survey Area. An additional four records



have been identified within 15 and 50 km from the Survey Area. Although the survey was undertaken outside the flowering period of this species, due to its distinct nature as a *Grevillea* and its size, it is considered that if the species were to exist within the Survey Area it would have likely been identified during the survey.

• Physopsis chrysophylla (P3) is an erect shrub ranging between 1 to 5 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are yellow to orange in colour and occur September through January (Department of Biodiversity Conservation and Attractions, 2019b). The two known records are both located 1.3 km from the Survey Area. Although the survey was undertaken outside the flowering period of this species, due to its distinct nature and size, it is considered that if the species were to exist within the Survey Area it would have likely been identified during the survey.

Based on the habitat type present and known distribution, 12 species have a medium likelihood of occurrence within the Survey Area, these are as follows:

- Eucalyptus beardiana (T, VU): Eucalyptus beardiana is listed as Endangered under the BC Act 2016 and Vulnerable under the EPBC Act. E. beardiana is described as a Mallee tree with smooth bark, ranging between 3 and 5 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are cream-white and occur between August to September. There are 71 records of the species with a distribution ranging approximately 300 km from the south of Shark Bay to the east of Geraldton (Department of Biodiversity Conservation and Attractions, 2019b, 2019c). The closest confirmed record to the Survey Area was identified approximately 67 km. Although the survey was undertaken outside the flowering period of this species, due to its distinct nature of Eucalypt species and it's the distinct size and form as a Mallee tree, it is considered that if the species were to exist within the Survey Area it would have likely been identified during the survey.
- *Eremophila splendens* (P1) exists as a shrub, flowering in September (Department of Biodiversity Conservation and Attractions, 2019b). The closest record is 43.9 km from the Survey Area. Although the survey was undertaken outside the flowering period of this species, due to its distinct nature of *Eremophila* species, it is considered that if the species were to exist within the Survey Area it would have likely been identified during the survey.
- Abutilon sp. Quobba (H. Demarz 3858) (P2) is an erect shrub ranging between 0.5 to 1.3 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are yellow-orange in colour and occur between July and September. The closet record is 15.0 km from the Survey Area. Due to the perennial nature, size of the species, and the survey occurring within the flowering period it is considered that if the species were present within the Survey Area it would have likely been identified during the survey.



- Adenanthos acanthophyllus (P2) is a robust shrub ranging from 2.0 to 6.0 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are red/pink and green and occur from April to July and can occur during December. The closet record is 44.5 km from the Survey Area. Due to the size of the species and the survey occurring within the flowering period it is considered that if the species were present within the Survey Area it would have likely been identified during the survey.
- Ptilotus alexandri (P2) is an erect, annual herb ranging from 0.1 to 0.3 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are pink and occur August to October. The closest record is located 28.2 km form the Survey Area. An additional three records have been identified within 38.0 and 44.3 km from the Survey Area. Due to the survey being undertaken outside the flowering period, the indistinct nature of the species and its existence as an annual species it is considered the species still has the potential to occur within the Survey Area.
- Scaevola chrysopogon (P2) is a perennial herb or shrub, ranging from 0.3 to 0.6 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are white-cream and occur August to October. Three records are located between 44.5 and 46.2 km from the Survey Area. Due to the survey being undertaken outside the flowering period and the existence through various forms species it is considered the species may have the potential to occur within the Survey Area.
- Thryptomene repens (P2) is a spreading shrub, and has been recorded ranging between 0.1 to 2 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are pink and have been observed between November and January. The closest record is 39.0 km from the Survey Area. As the survey was undertaken outside the suspected flowering range and due to the limited reference material available for this species it is considered to still have the potential to occur within the Survey Area.
- Lepidium biplicatum (P3) is an erect shrub with small white flowers that occur in September (Department of Biodiversity Conservation and Attractions, 2019b). There are six records within 45 km for the Survey Area. Due to the survey being undertaken outside the flowering period it is considered the species may have the potential to occur within the Survey Area.
- Macarthuria intricata (P3) is an intricately branched shrub ranging from 0.4 to 1.0 m high and 3 m wide (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are white-cream-yellow and occur September to December. The closest record is 44.5 km from the Survey Area. Although the survey was undertaken outside the flowering period, due to the distinct size and perennial nature of the shrub if the species were present within the Survey Area it would have likely been identified during the survey.



- Melaleuca huegelii subsp. pristicensis (P3) is a shrub or tree ranging from 0.9 to 5 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are pink-purple and occur September to October. Six records have been identified between 26.8 and 44.7 km form the Survey Area. Although the survey was undertaken outside the flowering period of this species, due to its distinct nature of Melaleuca species and its size, it is considered that if the species were to exist within the Survey Area it would have likely been identified during the survey.
- Phyllanthus fuernrohrii (P3) is a perennial herb or shrub ranging from 0.6 to 1 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers have been observed as green in colour, however the flowering period has not yet been determined. The closest record is 39.8 km from the Survey Area. Due to the limited information available for this species it is considered to still have the potential to occur within the Survey Area.
- Triodia bromoides (P4) is a tussock-forming perennial grass that ranges 0.5 to 1.5 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are green-purple and occur from July to October. There are 14 records identified within 36 to 45 km from the Survey Area. Due to the perennial nature, size of the species, and the survey occurring within the flowering period it is considered that if the species were present within the Survey Area it would have likely been identified during the survey.

Of the remaining potential Priority species, 13 are considered to have a low likelihood of occurrence within the Survey Area.

The presence of a Priority taxa does not form a statutory constraint for the Survey Area. There is no written policy on how to respond to the presence of Priority flora species within proposed development sites. The presence of the species is dealt with by DWER and DBCA on a case-by-case basis.

#### 5.1.3 Introduced Flora

One is listed as a Weed of National Significance. \*Lycium ferocissimum was recorded across the Survey Area in all four quadrats. This species is problematic in Australia due to its invasiveness, potential for spread, and economic and environmental impacts. It is a dense woody shrub up to 4 m high and 3 m wide and found across southern Australia in agricultural and pastoral areas and waste places around towns and cities (Haegi, 1976). It seems tolerant of most soil types and of some salinity. It is especially abundant in areas of high rainfall. Where its distribution enters drier regions, the plants are generally found close to permanent or seasonal water supplies (Haegi 1976). Some mechanical control of African Boxthorn is possible but there is likely to be re-growth from soil seed stores or from the taproot, meaning that cultivation and/or herbicides may need to be the next step (Haegi, 1976).



#### 5.1.4 Vegetation Types

To demonstrate enough survey effort, the statistical analysis and species accumulation curve were undertaken. However, due to the small sample size of quadrats (n=4) and the relatively small Survey Area (14.8 ha) the results of statistical analysis were deemed inconclusive and were not relied upon for delineating vegetation types. Due to the consistency in dominant species observed across all strata levels for each of the quadrats within the of the Survey Area, one vegetation type was delineated to occur across most of the Survey Area within the large intact section located on Lot 3004. Four quadrats were established across the section meeting the minimum requirement of three quadrats per vegetation as per the EPA Technical Guidance. The remaining section, running parallel to Monkey Mia Road, of the Survey Area was, was mapped by extrapolating data collected in mapping notes. Quadrats were unable to be established due to the 15 m width of this section. This section is mapped across three vegetation types. This could be possibly explained due to several reasons:

- Immediacy to road: Due to the proximity to the road, the area is subject to additional
  disturbances such as dust, decreased wind protection, foot traffic and litter that may
  influence the establishment of flora species and therefore influence vegetation
  mapping
- Geological composition: The vegetation observed exhibits a loss in the presence of *Triodia* hummock grasslands when transitioning southwards within the Survey Area. This is to be expected when considering the change in land and soil systems across the Survey Area (Figure 3). As the Survey Area transitions south from the Taillefer System to the Peron System, the characteristic change is described as the loss in spinifex grasslands. This is further supported when assessing the broad vegetation mapping (Figure 4) which transitions from the Peron 112 vegetation type to Denham 1101, where the main characteristic change again is described as the loss of hummock grasslands.

The Survey Area is representative of a transitional area consistent with existing broad scale vegetation and soil and land system mapping, and consistent with the vegetation composition observed during the survey.

To further delineate vegetation types across the Survey Area additional statistical analysis was undertaken with additional quadrat data from nearby surrounding areas (360 Environmental Pty Ltd, 2019a, 2019b). Although, still inconclusive due to relatively small areas and sample size similarities (17%, 28% and 42 %) were noted across the four quadrats within the Survey Area (Appendix E).

## 5.1.5 Vegetation of Conservation Significance

One Priority Ecological Community listed by the State and identified within 20 km radius of the Survey Area. None of the vegetation types identified across the Survey Area are



representative of the PECs identified in the desktop assessment due to the absence of suitable habitat required to support the PEC.

# 5.2 Vertebrate Fauna

#### Marine Birds

Of the 37 conservation significant fauna species (including Priority species), 28 of these are marine/coastal birds or wetland dependent migratory birds (76%). Although all of these marine/coastal bird species have the potential of occurring within the Survey Area (due to the proximity to the coast), none are likely to utilise these fauna habitats for either foraging, refuge or breeding. All have therefore been excluded from any further discussion and are considered unlikely to be negatively impacted by any disturbance within the Survey Area.

Any species with a conservation listing which is solely Marine under the EPBC Act, including the White-bellied Sea-Eagle, Black-faced Cuckoo-shrike, Tree Martin and Silver Gull are generally common and are not of conservation significance. As the Survey Area contains no marine specific habitat and these species are not considered conservation significant, these species have also been excluded from any further discussion.

#### 5.2.1 Fauna Habitat

All fauna habitats identified in the Survey Area during the field survey are considered to be common throughout the surrounding remnant vegetation areas (bushland surrounding the Survey Area) and also common throughout the overall Carnarvon bioregion and the Wooramel (CAR2) subregion. This includes the *Acacia* shrublands (Mulga, Bowgada and *A. coriacea*) over bunch grasses on red sandy ridges and plains (Desmond and Chant, 2001).

The two broad vegetation types that comprise the Survey Area continue extensively throughout the surrounding region, with Denham 1101 continuing to the north (with a total 16,260 ha) and Perron 112 continuing to the south (with a total 25,150 ha).

The fauna habitats that occur within the Survey Area provide value to common fauna species of the region, providing important refuge, foraging and breeding habitat. However, none provide specialist habitat value to any conservation significant fauna species.

#### 5.2.2 Species Recorded within the Survey Area

No species of conservation significance were Recorded during the survey.

## 5.2.3 Species Considered to have a High Likelihood of Occurrence

A total of two species of conservation significance are considered to have a high likelihood of occurrence within the Survey Area, including the Osprey and Western Grasswren. Each are discussed below.



# Osprey (Pandion haliaetus) - Migratory & Marine

The Eastern Osprey is considered to be moderately common in Australia (Olsen, 1998). The species is most abundant in northern Australia, where high population densities occur in remote areas (Johnstone and Storr, 1998). They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia (Marchant and Higgins, 1993; Olsen, 1995; Johnstone and Storr, 1998). They require extensive areas of open fresh, brackish or saline water for foraging (Marchant and Higgins, 1993). They frequent a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes (Olsen, 1995; Johnstone and Storr, 1998).

Although the species is considered to have a high likelihood of occurrence within the Survey Area, it will not regularly utilise the Survey Area and is not dependent on any of the fauna habitat, due to the lack of wetland habitats. Any disturbance within the Survey Area is unlikely to impact the species.

# Western Grasswren (Amytornis textilis textilis) – Priority 4

The Western Grasswren has disappeared from most of its southern arid zone but is still moderately common in Shark Bay. In the Shark Bay region, the species prefers Acacia shrubland with dense shrub clumps and lower recumbent shrubs in which foliage extends to the ground (Menkhorst et al., 2017). The species occurs in four types of shrubland (Higgins, Peter and Steele, 2001), two of which are similar to that fond within the Survey Area:

- Acacia shrublands on coastal dunes, coastal plains and red sandplains, dominated by Umbrella Bush Acacia ligulata, Dead Finish Acacia tetragonophylla, Horse Mulga Acacia ramulosa and Acacia sclerosperma, with chenopods such as saltbush Rhagodia spp. and Coastal Bonefruit Threlkeldia diffusa, other species of shrubs 1-3 m tall with a recumbent growth form that support twining species, and an extensive ground-cover of low shrubs, grasses and herbs.
- Low (less than 1.5 m high) shrublands on calcareous sandplains, dominated by Umbrella Bush, Native Cherry *Exocarpus* spp., and other shrubs such as *Thryptomene* spp., and *Ptilotus* spp., mixed with hummocks of spinifex *Triodia* spp., and sometimes with saltbush *Atriplex* spp.

The species has been recorded in close proximity to the Survey Area with four records recorded within 2 km of the Survey Area and a total of 21 records within 20 km of the Survey Area in the last 15 years. The species occurs throughout most of the Peron Peninsula. Although not recorded during the survey, the Western Grasswren is an inconspicuous species (Menkhorst *et al.*, 2017), potentially occurring within the Survey Area but not being detected during the field survey.

The Survey Area contains habitat that is preferred by the species in the *Acacia* Shrubland. Although the species has a high likelihood of occurrence within the Survey Area and is



likely to utilise the fauna habitat for both breeding, foraging and refuge, the Survey Area does not provide any specific value to the species that differs to the surrounding habitat. The species will also utilise the surrounding fauna habitat and therefore any disturbance within the Survey Area is unlikely to impact the species.

# 5.2.4 Species Considered to have a Medium Likelihood of Occurrence

Eight conservation significant fauna species are considered to have a medium likelihood of occurrence within the Survey Area. This includes four marine/coastal birds, as well as the following four terrestrial species:

- Pacific Swift (Apus pacificus) Migratory & Marine
- Malleefowl (Leipoa ocellata) Vulnerable
- Bilby (Macrotis lagotis) Vulnerable
- Woma (Aspidites ramsayi) Priority 1 (South West Population).

Each of the four species listed above are discussed below.

# Pacific Swift (Apus Pacificus) - Migratory and Marine under the EPBC Act

The Pacific Swift is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher. The Pacific Swift occupies a large airspace range (i.e. low to very high) over varied habitats, ranging from rainforests to semi-deserts (Morcombe, 2003). Although the species has the potential to occur in the airspace above the Survey Area, it will not be reliant on the habitats of the Survey Area. In addition, it has not been recorded within 10 km of the Survey Area in the last 15 years.

It is therefore concluded that the species will not be depend on the terrestrial habitat identified within the Survey Area and disturbance within the Survey Area is unlikely to impact the species.

# Malleefowl (Leipoa ocellata) - Vulnerable (BC Act and EPBC Act)

The Malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or *Acacias*. A sandy substrate and abundance of leaf litter are required for breeding. Densities of the birds are generally greatest in areas of higher rainfall and on more fertile soils where habitats tend to be thicker and there is an abundance of food plants. Much of the best habitat for Malleefowl has already been cleared or has been modified by grazing via Sheep, Cattle, Rabbits and Goats (Benshemesh, 2007).

Project Eden was an ambitious large-scale conservation project with the primary goal of translocation and reconstruction of the pre-European fauna populations of the Peron Peninsula, within the Shark Bay World Heritage Property (Morris et al., 2004). The project was an initiative of the then Department of Conservation and Land Management (CALM), now DBCA. Six species once found on the peninsula were reintroduced into Francois Peron



National Park, although the only two that established viable populations were the Malleefowl and Bilby. While still quite rare, these species have been breeding on the peninsula for several years and are occasionally seen on roads and tracks in and near the park. Malleefowl was recorded during the Ninox Wildlife Consulting survey for the Coburn Mineral Sand Mine, undertaken in 2002 (Ninox Wildlife Consulting, 2005) and by 360 Environmental on Useless Loop Road in 2018 (360 Environmental Pty Ltd, 2018).

Project Eden collected Mallefowl eggs from the wild in Kalbarri National Park, Nanga Station and northern wheat-belt reserves. The eggs were artificially incubated and the chicks hand-reared in the Peron Captive Breeding Centre before release. More than 65 Malleefowl were raised and released at 14 sites in Francois Peron National Park between September 1997 and September 1998 (Morris et al., 2004). Some released animals were fitted with radio transmitters to monitor their dispersal and survival rates. Malleefowl are still being sighted in 2016.

The Survey Area occurs within the known distribution of the species, and the Survey Area contains appropriate habitat in the form of *Acacia* Woodland. In addition, nine DBCA records of the species have been recorded within the Study Area in the last 15 years. Consequently, there is a possibility the species may occur within the Survey Area. However, the preferential habitat of the species comprised of Mallee woodland (due to the high leaf litter loads), are not present within the Survey Area. Also, targeted transect searches for the species did not yield any evidence of the species currently utilising the Survey Area.

Therefore, as it would appear the species is not currently utilising the Survey Area, and it does not contain the species preferred habitat, disturbance within the Survey Area is unlikely to impact the species.

#### Bilby (Macrotis lagotis) - Vulnerable

The Bilby was common throughout most of its range until the early 1900s when there was a sudden and widespread collapse. Its distribution may still be contracting and fragmenting. Direct and indirect impacts on food by a changing fire regime and the grazing of rabbits and livestock, predation by foxes and feral cats and drought in varying combinations are probably responsible for the decline (Woinarski, Burbidge and Harrison, 2014).

Bilbies occupy a variety of habitats that includes Mitchell Grass and stony downs country of cracking clays, the desert sandplains and dune fields sometimes containing laterite, with hummock grassland (Spinifex) and massive red earths with Acacia shrubland (Southgate, R, Paltridge, R, Masters, R, & Carthew, 2007; Van Dyck and Strahan, 2008). Free surface water is not typically available in the Bilbies range; as a result they derive most of their water from food. They are omnivorous and have a diet that consists of insects and their larvae, seeds, fruit and fungi and the proportions of these components in the diet can vary depending on location (Southgate and Carthew, 2006).



The same as the Malleefowl mentioned above, the Bilby has also been re-introduced to Peron Peninsula (within Francois Peron National Park) as part of Project Eden. A total of 151 bilbies from the Peron Captive Breeding Centre and 20 from Dryandra were released at ten sites on Peron Peninsula between October 2000 and 2005 (Morris et al., 2004). Bilbies were still doing well when about 30 more were released on the peninsula in 2013. Bilbies are apparently still being sighted in 2016.

Although the Survey Area contains the preferred fauna habitat of the species, the fauna habitat is similar throughout most of the Peron Peninsula. The Survey Area does not contain any specialist fauna habitat compared to the surrounding areas. Bilby activity is generally obvious in nature, due to the obvious diggings, scats and tracks left in the soft sand. Intensive targeted searches throughout the entire Survey Area did not identify any evidence of the species.

Therefore, as it would appear the species is not currently utilising the Survey Area, and similar habitat surrounds the Survey Area, any disturbance occurring within the Survey Area is unlikely to impact the species.

# Woma (Aspidites ramsayi) - Priority 1 (South West Population)

The Woma is a desert species that is most often associated with sandy terrain but is sometimes found in stony environments adjacent to sandy country. The range in Southwest Australia extends from Shark Bay, along the coast and inland regions, and was previously common on sandplains. The species was recorded in regions to the south and east, with once extensive wheatbelt and goldfield populations (Browne-Cooper R, Bush B, Maryan B, 2007).

The Survey Area occurs at the northern most extent of the species distribution. Although the Survey Area contains suitable habitat for the species, it does not contain any specialist fauna habitat for the species compared to the surrounding areas that occur on the Peron Peninsula. In addition, only one record of the species has been recorded within the Study Area in the last 15 years, suggesting it is not common to the area. Therefore, although it is considered that the species has a medium likelihood of occurrence, similar habitat surrounds the Survey Area and the species appears to occur in relatively low abundance. Consequently, any disturbance occurring within the Survey Area is unlikely to impact the species.



# 6 Conclusion

# Flora and Vegetation

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

- No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act 2016 were recorded during the survey
- Three DBCA listed Priority flora are considered to have been recorded; Acanthocarpus affinis rupestris (P2), Olearia occidentissima (P2) and Triodia plurinervata (P3). The presence of these species is unlikely to form a statutory constraint for the Survey Area and is dealt with by DWER and DBCA on a case by case basis.
- Five introduced species were recorded during the survey. One species, \*Lycium ferocissimum is listed as a Weed of National Significance by the Department of Energy and Environment (2018)
- Three vegetation types were mapped within the Survey Area. Towards the southern portion of the Survey Area, a significant change is observed due to the loss of *Triodia plurinervata* dominant grasslands. This change is expected and consistent with broad scale soil and vegetation mapping.

## Vertebrate Fauna

- No vertebrate fauna species of conservation significance were recorded during the level 1 vertebrate fauna survey, including targeted searches for evidence of Bilby and Malleefowl
- Two species of conservation significance are considered to have a high likelihood of occurrence within the Survey Area (Osprey and Western Grasswren) and eight species of conservation significance are considered to have a medium likelihood of occurrence within the Survey Area (includes four marine/coastal species as well as the Pacific Swift, Malleefowl, Bilby and Woma)
- The Survey Area does not contain any specialist fauna habitat for any of the above conservation significant species, and the fauna habitat is common, extending to the north and south of the Survey area, and likely throughout the Peron Peninsula
- Therefore, disturbance within the Survey Area is unlikely to impact any of the identified conservation significant vertebrate fauna species.



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# **APPENDIX A**

**Database Searches** 

	Name ID	Taxon	Cons Cod	e Plant Description	Site	Vegetation	Frequency	Notes	Locality	Geo Method	Precision	Date
				Shrub 1.5 m high with yellow		Low shrubland with associated vegetation: Acacia		Percentage of population				
7457758 5188156	14112	Abutilon sp. Hamelin (A.M. Ashby 2196) Abutilon sp. Hamelin (A.M. Ashby 2196)	2	flowers.	Plain flat, Dirk Hartog Island. Red sand.	sp., Diplolaena grandiflora, Exocarpus sp.	2 - 5 plants.	flowering 20 %	Eastern track, southern end Dirk Hartog Island	GPS MAN	1 4	30/08/20 /09/1980
4304845	14112	Abutilon sp. Hamelin (A.M. Ashby 2196)	2	2-4 ft high.	Brown sandy clay.			Abundance: occasional	32 km S turn right 3rd grid to break in fence,	AUTO	4	11/07/19
						Acacia sp Low Scrub A over Pimelea microcephala- A tetraennonhylla i Stylohasium spathulatum						
						Low Scrub B over Pittosporum phylliraeoides-			Approximately 8.5 km S of Useless Loop Township and			
5262836	14112	Abutilon so. Hamelin (A.M. Ashby 2196)	2		On cream silt on very gently inclined midslope of undulating uplands, above birrida.	Scaevola spp Low Heath C over Enchylaena tomentosa-Maireana tomentosa Low Heath D.			Trig Station, Shark Bay. N of gypsum minesite on E side of road. [Plot-usio06.]	MAN	0	8/10/199
						Pimelea microcephala-Acacia tetragonophylla- Alectryon oleifolia-Santalum acuminatum Heath						
						Alectryon oleifolia-Santalum acuminatum Heath B over Thryptomene spMelaleuca cardiophylla- Threlkeldia diffusa-Enchylaena tomentosa Low						
5241685	14117	Abutilon sp. Hamelin (A.M. Ashby 2196)	2		On pale red silty sand with 40% surface cover of litter on upland.	Threlkeldia diffusa-Enchylaena tomentosa Low Heath D over Austrostipa spp. Grass over Herbs.			Approximately 2.5 km SW of Trig Station Spit, Heirisson Prong, Shark Bay. East of Rubberneck Rd. [Plot-hepr02.]	MAN	0	26/09/19
3242003	.4111	Addition sp. Filminim (A.M. Admoy 2230)	-		nices on openio.				rong, shark day, cast or resource we. growing res.	moor.		20/03/2
						Diplolaena grandiflora-Ptilotus obovatus-Atriplex paludosa-Dodonea inequifolia-Acacia						
					On shallow red silty clay with 75% surface cover of limestone pavement and 20 % surface cover of	tetragonophylla Low Heath C to Dwarf Scrub D over Crassula colorata-Dioscorea hastifolia Herbs			c.10km N of Bibby Giddy Outcamp on Heirisson Prong. 30m SSE of Clough's Bar track at c.2.4km along track			
5263093	14112	Abutilon sp. Hamelin (A.M. Ashby 2196)	2	Slender shruh to 50 cm flowers	litter on NE facing, gently sloping upland.	and Austrostipa spp Grass.			from inc with Useless Loop Rd. [Plot-clbr02.]	MAN	0	25/09/1
				yellow with brown centres,								
3328112	14112	Abutilon so. Hamelin (A.M. Ashby 2196)	2	brownish outside.	In sand.	On Acacia steppe.			c. 0.8 km W of homestead. Dirk Harton Island	MAN	0	3/09/19
				wide. Dark yellow large flower with the centre 1/2 deep maroon		Hummock grassland with Buffel, Spinifex,						
7111584	14112	Abutilon sp. Hamelin (A.M. Ashby 2196)	2	colour.	Undulating, Red sand.	Commersonia sp.	rare.		Shearing Shed S Track-Zone 4	GPS	0	19/07/2
7988850	14114	Abutilon sp. Quobba (H. Demarz 3858)	2	Erect compact perennial shrub, height to 1.7 m, width to 90 cm.	Valley to plain; bare to littered brown clayey sand	Scrub.	abundant.	Also present: smut.	Fire plots on 18 mile track, Peron Peninsula	AUTO	2	15/10/2
						Acaria son Santalum soiratum Onen Scrub over						
						Dodonea inaequifolia-Exocarpos aphyllus -Acacia						
					On red sand with limestone pavement and 30%	tetragonophylla Heath B over Rhagodia latifolia- Ptilotus spp Dwarf Scrub over Enchylaena			Approximately 3 km west of Monkey Mia Jetty, Peron Peninsula, Shark Bay. West of track to water front			
5264529	3309	Acacia dresanoshvila	3		surface cover of litter, on upland with ENE aspect.	tomentosa-Maireana tomentosa Low Heath D.		D 104	north from Monkey Mia RD. [Plot-mmia01.]	MAN	0	14/10/1
1218530 614254	3309 3309	Acacia drepanophylla Acacia drepanophylla	3					Peron 104.	Peron Peninsula. Shark Bav Nanga Bay - Shark Bay area	MAN AUTO	3	16/11/1 //1976
5480078	3309	Acacia dreaanoohvlla	3	Bushy small tree ca 3 m tall. Spikes pale vellow.	On sandy rise adiacent to dry salt lake.	With much Acacia sclerosperma.	scattered and localised.		Ca 5 km SW of Monkey Mia on road to Denham.	AUTO	3	13/01/2
1231103	1207	Aconthocarpus parviflorus	3		Low limestone rise between two birridas:				Shark Bay.	AUTO	5	//1989
					limestone at surface, with orange-brown siliceous	Heathland dominated by Melaleuca						
1231081	1207	Acanthocarpus parviflorus	3		sand.	eleuterostachya, Bowgardia.		Site 102.	Shark Bay.	MAN	3	1/10/19
						Acacia tetragonophylla open Dwarf Scrub C over						
					On cream sandy silt with greater than 5% surface	Melaleuca cardiophylla -Thryptomene sp Low Heath D over Triodia pleurinervata Dense			1.8 km approximately S of Useless Loop Township and			
5263719	1210	Aconthocomus ninestris	2		cover of litter, on gently inclined, W-facing footslope at the back of dune.	Hummock Grass over Podolepis canescens- Lobelia heterophylla Very Open Herbs.			Trig Station, Shark Bay, on E side of Useless Loop-Perth Rd. [Plot-usip05.]	MAN	0	8/10/19
1080296	1768	Adenanthas acanthophyllus							Nanga Station, on road to Tamala Station, S of Shark			26/08/1
			- 2	Herb 0.1 m high x 0.1 m wide.	Dirk hartog Island. White dry clay loam.			Percentage of population	B3y	MAN	3	
7457723 414093	7830 7830	Anaianthus microceahalus	2	Flowers vellow.	Associated with depressions in saltflat.  On salt flat.	Halosarcia so saltflats.	6 - 20 plants.	flowering 80 %	Airstrio southern side By airfield, W of homestead, Dirk Hartog Island	GPS MAN	1 3	30/08/2
	7830			Prostrate decumbent annual;								
6000886 1243268	7830 6948	Anaianthus microceahalus Anthocercis intricata	3	vellow flowers. in early flower.	Red sand flat by saline channel: red clay sand.	Atriplex vesicaria low open shrubland.	verv common.		Faure Island: Shark Bav. Denham (Shark Bav)	MAN AUTO	3	28/05/2 /06/195
5678641	19520	Boronia crenulata subsp. Shark Bay (G. Cockerton 5187)	1	Shruh to 0.6 m high Flowers nink	On limestone outcrop.				Useless Loop Road, Shark Bay,	MAN	4	25/08/2
				Shrub to 0.6 m high. Flowers pink. Buisson epineux, haut de 60 cm,								24/07/1
1400045	30232		3	fleurs orange et rouge. Spreading shrub 30 m; flowers					Shark Bay, False entrance	AUTO	4	
2722887	30232	Bossiana calcicola	3	yellow and red.	In sand.	On steppe.			N side of Passage Paddock, Dirk Hartog Island	MAN	. 0	2/09/19
						Diplolaena grandiflora-Ptilotus obovatus-Atriplex						
					On shallow red silty clay with 75% surface cover of	paludosa-Dodonaea inequifolia -Acacia tetragonophylla Low Heath C to Dwarf Scrub D			c.10km N of Bibby Giddy Outcamp on Heirisson Prong.			
5241278	48659	Calandrinia sa. Edel Land IF. Obbens FO 01/17)	2		limestone pavement and 20 % surface cover of litter on NE facing, cently sloping upland.	over Crassula colorata-Dioscorea hastifolia Herbs and Austrostipa spp. Grass.			30m SSE of Clough's Bar track at c.2.4km along track from inc with Useless Loop Rd. (Plot-clbr02.)	MAN	0	25/09/1
						Acacia ligulata/rostellifera-Alyogyne cuneiformis						
						Low Scrub A over Requirertia dampieri Melalaura						
					On deep, white sand with 60% surface cover of	cardiophylla-Pimelea microcephala-Thryptomene sp-Rhagodia spp Low Heath C over Threlkeldia			Steep Point, Shark Bay. Approximately 7.5 km SE of Mt Direction. South of Steep Point Track and old fenceline.			
5248493	18359	Carpobratus sp. Thevenard Island (M. White 050)	3	Perennial nonstrate succulent	litter, on steep upper duneslope.	diffusa Dwarf Scrub C over Grass over Her			[Plot-stpt12.]	MAN	0	24/09/1
				plant with height 10 cm and width		Low shubland and grassland with low mat of			Bottle Bay Camp, behind toilets, Francois Peron			
7832168 991597	18359 12616	Carpobrotus sp. Thevenard Island (M. White 050) Chthonocephalus muellerianus	2	2 m.	Grey dry sand, dune, reserve.	Carpobrotus and Sporobelus virginicus.	over 50 plants.		National Park Denham area Near Shark Bay	UNK AUTO	2 5	12/05/2
4304764	7934	Chthonocephalus tamentellus	2	Prostrate.	Red clayey sand.	Shrubland.		Abundance: frequent	Monkey Mia bore and follow track to Cape Rose Beach	AUTO	-	29/08/1
-304764	7934											43/06/2
1233297	7934	Chthonocephalus tamentellus	2		Upper slope, east facing in gently undulating area orange-brown siliceous sand with paler surface.	With Lamarchea, Scaevola spinescens, Ptilotus obovatus.		Peron site 61.	Peron Peninsula, Shark Bay.	AUTO	3	9/11/19
						Lamarchea hakeifelia yar hakeifelia Olearia						
						dampieri ssp dampieri-Rhagodia preissii ssp obovata-Rhagodia latifolia ssp latifolia-Ptilotus						
5269873	7934	Chthonocephalus tamentellus	2		On red sand with 40% surface cover of litter on upland.	obovatus var obovatus Acanthocarpus robustus			Approximately 5 km NNW of Peron Homestead, Peron Peninsula, Shark Bay.	MAN	0	11/10/
						Acacia spp. Open Scrub over Exocarpos sp., Acacia tetragonophylla, Rhagodia sp. Open Dwarf Scrub			N side of Monkey Mia Road 12.75 km W of Monkey			T
					Gentle NW facing slope on undulating sandplain.	C over Ptilotus oboyatus Open Dwarf Scrub D over			N side of Monkey Mia Road 12.75 km W of Monkey Mia Caravan Park entrance on road to Denham. (Site:			
5021030	7934	Chthonocephalus tamentellus	2	Annual prostrate herb.	Red/orange sand.	Very Open Herbs Acacia ramulosa, Acacia tetragonophylla and			72).	GPS	1	30/08/
					Conta WANT for contact	Acadia co. Open Low Scrub A over Dodonana co.			N side of Monkey Mia Road 4 5 km W of Monkey Mia			
5021065	7934	Chthonocephalus tamentellus	2	Annual prostrate herb.	Gentle WNW facing slope on undulating sandplain. Red/orange sand.	and Rhagodia sp. Open Dwarf Scrub C over Brassica sp. Very Open Herbs			N side of Monkey Mia Road 4.5 km W of Monkey Mia Caravan Park entrance on road to Denham. (Site: 71).	GPS	1	30/08/
						Acacia linophylla and Lamarchea sp. Open Scrub						1
						Scrub A over Ptilotus obovatus Open Dwarf Scrub D over Aristida contorta Open Grass over Open			Francois Peron National Park, N of fence on track that			1
5020999	7934	Chthonocephalus tomentellus	2	Annual prostrate herb.	Flat on undulating sandplain. Red/orange sand.	D over Aristida contorta Open Grass over Open Herbs			goes E ( 3.6 km) from Cape Peron Road at 11 km N of Peron Homestead. (Site: 73).	GPS	1	31/08/
5664616	7934		2	Prostrate annual herb, flowers yellow, in full flower.	Low dune. Red sand.	Acacia low open shrubland.	common in area.		3 km W of Monkey Mia,	AUTO	2	29/08
						Atriplex vesicaria low shrubland with scattered	and market					
6097200 4134370	7934 18132	Chthonocephalus tamentellus Dicrastylis sp. Denham (M. Lewis 42/92)	1	Annual. Flowers yellow. Dwarf shrub.	Red sand flat by saline channel. Red sand - clay. Grey sand.	Acacia tetragonophylla. Hummock grassland.	rare. occasional.		Northern end Faure Island, Shark Bay 17 km S Denham, right side of road	GPS MAN	3	28/05/ 26/09/
								Voucher collections from two plants (A & B) for				
								propagation. Cuttings and grafted material				1
4567501	14196	Eremophila cuneata	1					grafted material unsuccessful (4/12/1995).	c. 5-6 km SE of Steep Point, Carnarvon Botanical District,	MAN	2	25/10
8260362	17151			Shrub to 50 cm, sparse, woody	Ungung rand	Heathland. Associated taxa: Brachyscome		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Steep Point, 6.1 km S Blackies camp	UNK		31/08
		Arternopolital Spectroscrip	1	flowers red. Shrub to 50 cm, sparse, woody	Uneven, sand.	latisquamea, Senecio spp., Podolepis spp. Heathland. Associated taxa: Brachyscome						
8260354	17151	Eremaphila salendens	1	flowers orange.	Uneven. sand.	latisquamea. Senecio sop Podolepis sop.			Steep Point: 6.1 km S Blackies camp	UNK	11	31/08/
			1			Alyogyne cuneiformis Open Low Scrub A over						
						Melaleuca cardiophylla-M, huegelii -Diplolaena						1
					On deep, cream sand with 30% surface cover of	grandiflora Low Scrub B over Dense Low Heath C over Threlkeldia diffusa-Rhagodia preissii-R.			Steep Point, Shark Bay. Approximately 2.5 km SE of Mt			

	Name ID	Taxon	Cons Ci	ide Plant Description	Site	vegetation		Notes				Date
7385803	17151	Eremophila splendens	1	Shrub to 30 cm, red flowers.	Steep.	Heath. Brachyscome latisquamea, Myoporum parvifolium.			7 km from Steep Point at Blackies Beach	GPS	1	31/08/200
						Melaleuca cardiophylla-Thryptomene sp Low						
					On deep, cream sand to silty sand on lowland	Heath D over Triodia bromoides Mid-Dense Hummock Grass over Waitzia podolepis-Senecio			Steep Point, Shark Bay. Approximately 5 km SE of			
5248140	17151	Eremaphila salendens	1		olain.	lautus Open Herbs.			Monkey Rock. (Plot-stat08.)	MAN	0	22/09/199
						Eucalyptus aff prominens Low Forest A over						
						Acacia ligulata/rostellifera -Exocarpos aphyllus Heath A over Pimelea microcenhala-Scaevola son			Approximately 8.5 km N of Peron Homestead, Peron			
					On deep, red sand with 40% surface cover of litter,	Heath A over Pimelea microcephala-Scaevola spp Low Scrub B over Ptilotus obovatus-P. divaricatus-			Peninsula, Shark Bay. East of Peron Homestead-Cape			
5247284 2118866	13544 2083	Eucalyptus zopherophloia Grevillea rogersoniana	4 3	Mallee form.	on SW-facing gentle slope on upland.	Thryptomene sp Low Heath D			Peron Rd. [Plot-pern09.] Shark Bay road	MAN	5	13/10/199 /01/1962
1841122	2083							Collection date: Jan/Feb 1962 ?	Between Shark Bay and Hamelin Pool Station	AUTO		/01/1962
			- 3					1962 /	"Nilemah", a bore on the SE side of Nanga Station, near the S end of Hamelin Pool		- 5	
2850788	2083	Grevillea ragersoniana	3		Red sand over red sandy clayloams.			Poison - Mercuric chloride	near the S end of Hamelin Pool	AUTO	4	/10/1992
				Shrub to 4 m, flowers deep pink-				may be present on				
1336274	2083	Grevillea rogersoniana	3	red.	Red sand.  Slight slone from fairly high crest orange brown	Acacia scrub.  Dominated by Grevillea gordoniana, Banksia		specimen.	36 miles S of Denham	AUTO	3	26/08/196
1223232	2083	Grevillea roaersoniana	3		Slight slope from fairly high crest, orange brown sand with pale orange surface.	ashbvi. Lamarchea.			Shark Bav	MAN	3	18/09/198
1663615	2083	Grevillea rogersoniana	3	Arbor vel frutex usque 8 met. alt.; perianthium roseum.	In arenosis.	In fruticetis.			Prope [near] Shark Bay	AUTO	5	24/08/196
				Fl. m. Aug. Septem. [Flowering mis				Checked in C.A. Gardners collecting book. P. Breidahl	Hab. in distr. Irwin. Septentrionalem versus ad Shark			
1551825	2083	Grevillea ragersoniana	3	August to September).	In arenosis fruticetis.			11/2/2009	Bay (in Irwin district, N of and near to Shark Bay)	AUTO	5	24/08/196
				Fl. m. Aug, Septem. (Flowering min	1			Checked in C.A. Gardners collecting book. P. Breidahl	Hab. in distr. Irwin. Septentrionalem versus ad Shark			
1551876	2083	Grevillea rogersoniana	3	August to September].	In arenosis fruticetis.			11/2/2009	Bay [in Irwin district, N of and near to Shark Bay]	AUTO	5	24/08/196
				Fl. m. Aug. Septem. (Flowering mi	1-			Checked in C.A. Gardners collecting book. P. Breidahl	Hab. in distr. Irwin. Septentrionalem versus ad Shark			
1551892	2083	Grevillea ragersoniana	3	August to September].	In arenosis fruticetis.			11/2/2009	Bay [in Irwin district, N of and near to Shark Bay]	AUTO	5	24/08/196
				Fl. m. Aug. Septem. (Flowering mi	5-			Checked in C.A. Gardners collecting book. P. Breidahl	Hab. in distr. Irwin. Septentrionalem versus ad Shark			1
1551868	2083	Grevillea ragersoniana	3	August to September].	In arenosis fruticetis.			11/2/2009 Checked in C.A. Gardners	Bay (in Irwin district, N of and near to Shark Bay)	AUTO	5	24/08/196
				Fl. m. Aug. Septem. (Flowering mi	s-			collecting book. P. Breidahl	Hab. in distr. Irwin. Septentrionalem versus ad Shark			Ι.
1551841	2083	Grevillea rogersoniana	3	August to September].	In arenosis fruticetis.			11/2/2009 Checked in C.A. Gardners	Bay [in Irwin district, N of and near to Shark Bay]	AUTO	- 5	24/08/19
		L		Fl. m. Aug. Septem. (Flowering mi	1-			collecting book. P. Breidahl	Hab. in distr. Irwin. Septentrionalem versus ad Shark		1 .	
1551884	2083	Grevillea ragersoniana	3	August to September].	In arenosis fruticetis.			11/2/2009 Checked in C.A. Gardners	Bay [in Irwin district, N of and near to Shark Bay]	AUTO	- 5	24/08/196
		Constitution of the Consti		Fl. m. Aug. Septem. (Flowering min August to September).	In arenosis fruticetis.			collecting book. P. Breidahl 11/2/2009	Hab. in distr. Irwin. Septentrionalem versus ad Shark		1 .	24 (22 (2
1551833 2118831	2083	S Grevillea rogersoniana	3	August to Septemberi.	in arenosis truticetis.			11/2/2009	Bav lin Irwin district. N of and near to Shark Bavl Between Shark Bay and Hamelin Pool	AUTO	4	24/08/196 //1961 24/09/195
1900609	19192	Grevillea sp. Shark Bay (N.H. Speck 24/09/1953)	1	Erect herb 250 mm high x 200 mm					Shark's Bay,	AUTO	- 5	24/09/195
				wide. Pale pink flowers, 4 lobes, 4								
				calyx, 6 stamens, new and old leaves. Seeds green to brown	Valley - plain - birrida (salt flat). Crusted brown-	Ji. Salt bush, Zygophyllum glaucum, Angianthus						
4662555	3020	Leoidium biolicatum	3	when drv.	vellow clav saline.	sp Commersonia gaudichaudii.	frequent.		32 km S of Denham. left on salt flat	TOPO	3	19/08/199
						Acacia ligulata/rostellifera-Melaleuca cardiophylla Open Low Scrub B over Atriplex						
					On cream sand with shell grit and 20% surface	paludosa-Rhagodia latifolia-R. cf preissii Thryptomene sp Dense Low Heath D over Triodia			Edel Land, Shark Bay. c. 8.5 km SSE of Mt Direction,			
					cover of litter, on very gently inclined, ENE-facing	bromoides-Austrostipa spp Mid-Dense Hummock			accessed by 4WD track to Thunder Bay, Blowholes &			
5262771	3020	Lepidium biplicatum	3		lower duneslope/swale.	Grass.			Crayfish (Epineux) Bay. [Plot-tbat01.] 2 km W of Monkey Mia on road to Denham, Peron	MAN	0	18/09/199
3396363	3020	Lepidium biplicatum	3		Edge of salt pan in clay.				Peninsula	MAN	0	29/09/198
						Alyogyne cuneiformis Open Low Scrub A over Melaleuca cardiophylla-Scaevola tomentosa -						
					On deep, pale red silty sand with 5% limestone	Eremophila oldfieldii ssp oldfieldii Dwarf Scrub C						
5270162	3020	Leoidium biolicatum	3		pebble surface cover and 20% surface cover of litter, on upland with westerly aspect.	over Triodia pleurinervata Dense Hummock Grass.			Approximately 5.5 km SSW of Trig Station Useless, Heirisson Pronz. Shark Bav. [Plot-heor04.]	MAN	0	26/09/199
3279588	3020	Leoldium biolicatum	3						Dirk Hartog Island	AUTO	4	/09/1972
				Upright herb, 0.2 m high x 0.05 m				Just prior to first dunes on				
7107242 1080393	3020	Leoidium biolicatum Leoidium puberulum	3	wide. Four petal white flowers.	Flat, Limestone. Brown sand. In sand, in small yard.	Hummock Grassland with Triodia.	frequent.	coast.	Blue metal track. Wilson Island: Shark Bav Area Cape Ransonnet. Dirk Hartoe Island.	TOPO MAN	3	21/08/200
						Alvogyne cuneiformis Open Low Scrub A over						
						Alyogyne cuneiformis Open Low Scrub A over Melaleuca cardiophylla-M. huegelii -Diplolaena						
					On deep, cream sand with 30% surface cover of	grandiflora Low Scrub B over Dense Low Heath C over Threlkeldia diffusa-Rhagodia preissii-R.			Steep Point, Shark Bay. Approximately 2.5 km SE of Mt			
5247411	3043	Lepidium puberulum	4		litter, on dune crest.	latifolia-Thryptomene sp Low Heath D.			Direction. [Plot-stpt04.]	MAN	0	21/09/199
3297268	2841	Macarthuria intricata	3	Small ericoid shrub 3 ft. flowers	Sandplain.	Among Banksia ashbyi.			Tamala road, on Nanga Station, Shark Bay	AUTO	3	26/08/197
2695855	13270	Melaleuca huegelii subsp. pristicensis	3	mauve.		In Acacia ligulata scrub.			Inland of Sandy Point, Dirk Hartog Island	AUTO	3	18/10/197
						Melaleuca huegelii ssp pristicensis-Thryptomene sp Dense Low Heath C over Atriplex paludosa ssp			Approximately 2 km SW of Trig Station Soit. Heirisson			
					On deep, white sand with shell grit and 10%	moquiniana-Threlkeldia diffusa Open Dwarf			Prong, Shark Bay. West of Rubberneck Rd. [Plot-			
5252350		Melaleuca hueaelii subsa. aristicensis	3		surface cover of litter, on beach.	Scrub D.			heor01.1	MAN	- 0	26/09/199
2695863	13270	Melaleuca huegelii subsp. pristicensis	3	Large shrubs 3.5 ft.	Light tan sandy soil.	-			1 mile N of Sandy Point, Central, Dirk Hartog Island	AUTO	4	6/09/1967
						Low shrubland. Thryptomene baeckeacea,		Within area for proposed				
6166822	13270	Melaleuca huegelii subsp. pristicensis	3	+	Dry sand.	Triodia, Melaleuca cardiophylla, Acacia ligulata.		earth works.	ca 500 m WSW of Useless Loop townsite	MAN	3	/06/1999
						Shrubland. Melaleuca huegelii subsp. pristicensis, scattered Zygophyllum fruticulosum, Nicotiana						1
6101453	13270	Melaleuca huegelii subsp. pristicensis	3	Very wind blown.	Fringing inlet. Moist white sand.	scattered Zygophyllum fruticulosum, Nicotiana occidentalis subsp. hespesis.	dominant > 100 plants.		Shark Bay Salt Lease, Useless Loop	MAN	0	29/07/199
					Undulating narrow band of shelly coarse							
1229591	13270	Melaleuca huegelii subsp. pristicensis	3	Shrub 2.8 m tall.	calcareous sand, pale gre (brownish).	Low Melaleuca woodland.		Site 109.	Shark Bay.	MAN	- 0	4/10/1989
						Acacia sclerosperma Open Low Scrub A over A.						1
						ramulosa-A. tetragonophylla- Dodonea viscosa Dense Heath B over Scaevola spp-Stylobasium			c. 22 km NNW of Peron Homestead, Peron Peninsula,			
5263506	12620	Oleania occidentissima	,		On red sand with 40% surface cover of litter, on gentle, NE-facing lower slope above birrida.	spathulatum Dwarf Scrub C over Acanthocarpus robustus-Ptilotus obovatus Dwarf Scrub D.			Shark Bay. 400m S of fork in road to Herald Bight and Cape Peron, on W side of road. [Plot-pern03.]	MAN	0	11/10/19
azasalb	12055	and a second	- 2		, re-wong ower stope above birrida.				angue aron, on wasse or rose. [PIOC-perious.]		-	44/40/195
						Acacia spp-Santalum spicatum Open Scrub over Dodonea inaequifolia-Exocarpos aphyllus-Acacia						1
					On red sand with limestone pavement and 30%	tetraennonhylla Heath B over Bhagodia latifolia-			Approximately 3 km west of Monkey Mia Jetty, Peron			
5250714	12639	Oleania occidentissima	2	In bud.	On red sand with limestone pavement and 30% surface cover of litter, on upland with ENE aspect.	Ptilotus spp Dwarf Scrub over Enchylaena tomentosa-Maireana tomentosa Low Heath D.			Peninsula, Shark Bay. West of track to water front north from Monkey Mia RD. [Plot-mmia01.]	MAN	0	14/10/199
						Acacia tetragonophylla-Pimelea microcephala Dwarf Scrub C over Diplolaena grandiflora-			·			
						Atriplex bunburyana-Rhagodia latifolia-R. cf						
					On red silty clay with 90% surface cover of	preissii-Ptilotus obovatus Low Heath D over Crassula colorata-Sonchus tennerimus and other			4 km S to SSE of Useless Loop Township and Trig Station, Shark Bay. N of access road along beach. (Plot-			1
5263115	12639	Oleania occidentissima	2		limestone outcrop, on gently sloping upland.	Herbs			station, snark Bay. N of access road along beach. [Plot- uslp02.]	MAN	0	23/09/19
						Anthocercis littorea - Acacia tetragonophylla Open Low Scrub B over Atriplex paludosa ssp						1
						monulaises. Olessis con Scanuals con Durart			L			1
					On pale orange-red sandy silt with shell grit and 30% surface cover of litter on NE-facing gentle	Scrub C over Thryptomene sp-Melaleuca cardiophylla Dense Low Heath D over Very Open			Near W edge large birrida c.11km SSW Useless Loop town. E side Rubberneck Rd & W side of side-track			1
5247519	12639	Oleania occidentissima	2	1	lower slope on limestone fringing birrida.	Herbs.			through birrida, 0.9km from edge. [Plot-bora01.]	MAN	0	27/09/19
						Bossiaea walkerii-Diplolaena grandiflora Low						1
			1	1	1	Heath C over Sida calyxhymeniana- Frankenia					1	
					On organic rand with 90% of curface carres	pauciflora Atlietus obouatus Phagodia Intifolia			Taillefor irthmur. Shark Bay. Approximately Clim Maries			
					On orange sand with 90% of surface cover limestone/sandstone cobbles and stones, on moderately steep upper slope of limestone bluff.	pauciflora-Ptilotus obovatus-Rhagodia latifolia Dwarf Scrub D over Austrostipa spp- Austrodanthonia caespitosa Very Open Grass.			Taillefer Isthmus, Shark Bay. Approximately 6 km NNW of repeater station site near Goulet Bluff. [Plot- whal01.]			15/10/19

et													
	Name ID	Taxon	Cons	Code	Plant Description	Site	Vegetation	Frequency	Notes	Locality	Geo Metho	1 Precision	Date
							Bossiaea walkerii-Diplolaena grandiflora Low Heath C over Sida calyxhymeniana- Frankenia						
						On orange sand with 90% of surface cover	pauciflora-Ptilotus obovatus-Rhagodia latifolia			Taillefer Isthmus, Shark Bay. Approximately 6 km NNW			
5264510	12639	9 Oleania occidentissima	,	,		limestone/sandstone cobbles and stones, on moderately steep upper slope of limestone bluff.	Dwarf Scrub D over Austrostipa spp- Austrodanthonia caesoitosa Verv Ooen Grass.			of repeater station site near Goulet Bluff. [Plot- whal01.]	MAN		15/10/199
320+310	12039	Diebnia occidentissima	-			moderates v steed upper stope of illinescone druit.				WHAIDI.I	MAN		15/10/199
6000754	12620	Olearia occidentissima	,	,	Slender erect shrub; 1.5 m high. In bud.	Low sandy rise: red sand with limestone.	Very open low Acacia tetragonophylla shrubland with Triodia olurinervata grassland.	rare.		Faure Island: Shark Bav.	MAN	,	25/05/200
0000734	12033	J Dictaria Occidentistania				COW SENSO FIRM, NEW SENSO WITH INTERCONE.	Will Hoos Statistics Elegation.	Tare.		and the state of t	inoca	-	13/03/100
					Prostrate open perennial shrub, 0.4 m high x 0.6 m wide. Flowers	Hillside. Road verge. Dry brown sand. Old soil				Stella Rowley Drive, 400 m from junction with Monkey			
7370946	12639	9 Oleania occidentissima	2	2	pink. Reproductive method: seeds.	disturbance.	Low shrubland. With GB 825.	one only.	Population structure: adult.	Min Road	GPS	1	7/03/2004
										C. 1 km NE of Denham, c. 200 m along Henfry Road from Monkey Mia Road near the wastewater			
9061991	12639		2	2	Low shrub to 0.5 m tall.	Sand.		20+ plants.			GPS	1	19/08/201
1620622 1620630	4677 4677	Phylianthus fuernrahrii Phylianthus fuernrahrii	3	3		On limestone clifftop. On limestone clifftop.				Quoin Bluff South, Dirk Hartog Island Quoin Bluff South, Dirk Hartog Island	MAN MAN	0	3/09/1972 3/09/1972
1869752	17208	Physopsis chrysophylla	3	3						? Shark Bay	AUTO	5	//
2693712	17208	Physopsis chrysophylla	3	3						Shark Bay District	AUTO	5	//
							Acacia tetragonophylla open Dwarf Scrub C over						
						On cream sandy silt with greater than 5% surface	Melaleuca cardiophylla -Thryptomene sp Low Heath D over Triodia pleurinervata Dense			2.5 km approximately S of Useless Loop Township and			
5263050						cover of litter, on gently inclined, W-facing	Hummock Grass over Podolepis canescens-			Trig Station, Shark Bay. On E side of Useless Loop-Perth		_	
		2 Ptilotus alexandri	-	2		footslope at the back of dune.	Lobelia heterophylla Very Open Herbs. On open steppe among Plectrachne sp. and			Rd. [Plot-uslp05.]	MAN	U	8/10/1997
210749	2692	Ptilotus alexandri	2	2	Ephemeral herb; flowers pink	Sandy.	Acacia ligulata.  Melaleuca cardiophylla-Thryptomene sp Low			Dirk Hartog Island near Notch Point	MAN	3	7/09/1972
							Heath D over Triodia bromoides Mid-Dense						
			_			On deep, cream sand to silty sand on lowland	Hummock Grass over Waitzia podolepis-Senecio			Steep Point, Shark Bay. Approximately 5 km SE of			
5263042	2692	2 Ptilotus alexandri	2	2		plain.	lautus Open Herbs Melaleuca cardiophylla-Thryotomene sp Low			Monkey Rock. [Plot-stpt08.]	MAN	0	22/09/199
							Heath D over Triodia bromoides Mid-Dense						
5250331	2692	2 Ptilotus alexandri	2	2		On deep, cream sand to silty sand on lowland plain.	Hummock Grass over Waitzia podolepis-Senecio lautus Open Herbs.			Steep Point, Shark Bay. Approximately 5 km SE of Monkey Rock. [Plot-stpt08.]	MAN		22/09/199
4274598	12580	Scarvala chrysopogon	2	2	c. 50 cm high.	Brown sand.	Woodland.	one only.		7 km past Nanga [Homestead], right side of road	MAN	3	28/09/199
							Acacia ligulata/rostellifera-A. ramulosa-						
							Eremophila maitlandii-Grevillea stenobotrya Low						
						On deep, red sand with 40% surface cover of litter,	Scrub A over Stylobasium spathulatum- Lechenaultia linarioides-Pimelea microcephala			5 km ENE of Nanga Station Homestead. East of Nanga			
5264693	12580	Scorvola chrysopoaon	2	2		on upland.	Heath B over Triodia Dense Hummock Grass			Bore and Yards, south of track. [Plot-nane01.]	MAN	0	3/10/1997
							Acacia ligulata/rostellifera-A. ramulosa-						
							Framonhila maitlandii Genvillaa etanohotora Low						
						On deep, red sand with 40% surface cover of litter,	Scrub A over Stylobasium spathulatum- Lechenaultia linarioides-Pimelea microcephala			S km ENE of Nanga Station Homestead, East of Nanga			
5251168	12580	Scarvala chrysopogan	2	2		on upland.	Heath B over Triodia Dense Hummock Grass.			Bore and Yards, south of track, [Plot-nang01.]	MAN	0	3/10/1997
					Decumbent annual 5-10 cm high x								
4924096	12730		2	2	20 cm wide. Flowers yellow.	Low dunes, red sand over sand.	Acacia low shrubland.		Abundance: very common.	3 km S of Monkey Mia,	AUTO	3	27/08/198
4196902	12730		-	2	Annual. Leaves fleshy. Flowers					Salt flat before Goulet Bluff	MAN	U	7/09/1993
1691791	12730	Sondattia glabrata	2	2	yellow.	Growing in flat saline.	Chenopodiaceae steppe.			78 km from Overlander Roadhouse on Denham Road	TOPO	3	30/09/198
415804	12730	Sondottia alabrata	2	2		Edge of salt pan in clay.				2 km W of Monkey Mia on road to Denham, Peron Peninsula	MAN	0	29/09/198
	12730				Erect herb 10 cm high. Fluffy								
6962343 2470845	12/30	Sondottia glabrata Soeraularia nesaahila	3	3	flowers.	Flat. Dry red sand. In sand. in grazed area by mill.	Scrub heath.	frequent.		Shark Bay, proposed gravel pit Two Wells Mill. Dirk Hartog Island	GPS MAN	0	29/09/200 2/09/1972
1221108 2189194	14241 44701	Stenanthemum divaricatum  Thryptomene repens	2	2	Sprawling shrub; flowers pink.	On small dune in birrida. In sand, on steppe.	With Melaleuca cardiophylla, Loxocarya.		1 km north of Avicennia site.	Shark Bay N side of Passage Paddock, Dirk Hartog (Island)	AUTO MAN	5	8/10/1989 2/09/1972
7546378	44701				Prostrate shrub spreading to 2 m,	_	Heath. Eremophila splendens, Melaleuca						31/08/200
		***************************************	2	2	pink flowers. Prostrate shrub to 1.05 wide x 10	Steep.	cardiophylla, Scaevola crassifolia. Shrubs, heath. Hyalosperma glutinosum, Acacia			7 km from Steep Point at Blackies Beach 14.2 km W of the causeway (4 wheel drive track) into	GPS	1	
7546351	44701	1 Thryptomene repens	2	2	cm high, pink flowers.	Rolling sand dunes, white sand.	sp., Atriplex sp.		Sampled from 50 plants.	Steep Point	TOPO	3	13/11/200
3627853	17003	5 Triodia bromoides	-	•	Spinifex. = 7077.		In A. ligulata scrub.			Dirk Hartog Island near homestead	AUTO	- "	17/10/197
							Acacia ligulata/rostellifera-Alyogyne cuneiformis Low Scrub A over Beaufortia dampieri -Melaleuca						
							LOW SO DO A OVER BEAUTOR DA DATEIDIETT -INVELATEURA						
							cardiophylla-Pimelea microcephala-Thryptomene			Steep Point, Shark Bay. Approximately 7.5 km SE of Mt			
5240220	17005	- Tradit have side				On deep, white sand with 60% surface cover of	cardiophylla-Pimelea microcephala-Thryptomene sp-Rhagodia spp Low Heath C over Threlkeldia			Steep Point, Shark Bay. Approximately 7.5 km SE of Mt Direction. South of Steep Point Track and old fenceline.			24 (00 (100
5249228	17885	5. Triadia bromoides	4			On deep, white sand with 60% surface cover of litter, on steep upper duneslope.	sp-Rhagodia spp Low Heath C over Threlkeldia diffusa Dwarf Scrub C over Grass. Anthocercis littorea-Acacia tetragonophylla Open			Steep Point, Shark Bay. Approximately 7.5 km SE of Mt Direction. South of Steep Point Track and old fencelline. [Plot-stot12.]	MAN	0	24/09/199
5249228	17885	5 Triodia bramoides	4	ı		litter, on steep upper duneslape.	sp-Rhagodia spp Low Heath C over Threlkeldia diffusa Dwarf Scrub C over Grass. Anthocercis littorea-Acacia tetragonophylla Open Low Scrub B over Atriplex paludosa ssp			Direction. South of Steep Point Track and old fenceline. [Plot-stot12.]	MAN	0	24/09/199
			4			litter, on steep upper duneslope.  On pale orange-red sandy silt with shell grit and 30% surface cover of litter on NE-facing gentle	sp-8hagodia spp Low Heath Cover Threlkeldia diffusa Dwarf Scrub C over Grass. Anthocercis littorea-Acacia tetragonophylla Open Low Scrub B over Atriplex paludosa ssp moquiniana-Olearia spp-Scaevola spp Dwarf Scrub C over Thryptomene sp-Melaleuca			Direction. South of Steep Point Track and old fenceline. [Plot-stot12.]  Near W edge large birrida c.11km SSW Useless Loop town. E side Rubberneck Rd & W side of side-track	MAN	0	
5249228 5263131		5, Triadia bromaides 5, Triadia bromaides	4	1		On deep, white sand with 60% surface cover of litter, on steep upper dunestope.  On pale orange-red sandy silt with shell grit and 30% surface cover of litter on NE-facing gentle lower slope on limestone fringing birrida.	sp-8hagodia spp Low Heath C over Threlikeldia diffusa Dwarf Srub C over Grass. Anthocercis littorea-Acacia tetragenophylla Open Low Scrub B over Atriplex paludosa ssp moquinisna-Olearia spp-Scaevola spp Dwarf Scrub C over Thryptomene sp-Melaleuca cardiophylla Dense Low Heath D.			Direction. South of Steep Point Track and old fenceline.	MAN	0	24/09/199 27/09/199
			4	1		litter, on steep upper duneslope.  On pale orange-red sandy silt with shell grit and 30% surface cover of litter on NE-facing gentle	spBhagodia spp. Low Heath C over Threlikeldia diffusa Dwarf South C over Grass. Anthocerus littorea-Acata tetragenophylia Open Low Scrub B over Artiples palaelosa ssp moquiniana-Olearia sppScaevola spp. Dwarf Scrub C over Thryptomene sp-Melaleuca cardiophylia Dense Low Heath D. Acacia (igulata/rostellifera-Melaleuca cardiophylia Open Low Scrub B over Attriplex			Direction. South of Steep Point Track and old fenceline. [Plot-stot12.]  Near W edge large birrida c.11km SSW Useless Loop town. E side Rubberneck Rd & W side of side-track	MAN	0	
			4			litter, on steep upper duneslope.  On pale orange-red sandy silt with shell grit and 30% surface cover of litter on NE-facing gentle lower slope on limestone fringing birrida.	sp. 8hagodis spp Low Heath C over Threliseldia differa Dawl STow Cover Grass. Anthocorcis littorea Acasia tetragenophylla Open Low Struß B over Artiples paludosa spp moquintana-Glearia spp Scaevola spp Dwarf Scrub C over Throptomene ps. 4helselacca cardiophylla Dense Low Heath D. Acacia ligulata Trocellifera Metaleuca cardiophylla Open Low Scrub B over Artiplex souldosa.8hadod la thtolia x C oriesia i valudosa.8hadod la thtolia x C orie			Direction. South of Steep Point Track and old fencelline.  [Mot-tent 2].  Near W edge large birrida c 11km SSW Useless Loop  town. E side Rubbermeck Rd & W side of side-track  through birrida, 0.9km from edge. [Piot-bora01.]	MAN	0	
5263131	17885	5 Triadio bramaides	4	1		litter, on steeo useer duneslose.  On pale orange-red sandy slit with shell girt and 30% surface cover of litter on NE-Eacing gentle lower slope on lineschone fringing blinds.  On cream sand with shell girt and 20% surface cover of litter, on very gently inclined, EME-Baring.	sp-Rhagodiu spp Low Heath C over Threliseldia differa Dawd Srob C over Grass. Anthocercis littores Acata letragenophylla Open Low Srob B over Artiples paludous ssp moquintan-Oleana spp Sacevola spp Dwarf Scrub C over Thrylor paludous scrub Scrub C over Thrylor Dwarf Dwarf Scrub C over Thrylor Dwarf Acaca ligulats / Arcia ligulats / Arci			Direction, South of Steep Point Track and old fenceline. (Mort dest[12])  Near W edge large birrids c.11km SSW Useless Loop town. Es de Rubberneck Rd & W side of side track through birrids, D.SW mfore ElPost-bora011.  Gdel Land, Shark Bay, c. 8.5 km SSE of Mt Direction, accessed by WMD rack to Thunder Bay, Blowholes &	MAN MAN	0	27/09/199
		5 Triadio bramaides	4			litter, on steeo uncer dumeslone.  On pale orange-red sandy sit with shell girt and 30% surface cover of litter on NE-facing gentle lower slope on limestone fringing birrida.  On cream sand with shell girt and 20% surface.	sp. 8hagodis spp Low Heath C over Threliseldia differa Dawl STow Cover Grass. Anthocorcis littorea Acasia tetragenophylla Open Low Struß B over Artiples paludosa spp moquintana-Glearia spp Scaevola spp Dwarf Scrub C over Throptomene ps. 4helselacca cardiophylla Dense Low Heath D. Acacia ligulata Trocellifera Metaleuca cardiophylla Open Low Scrub B over Artiplex souldosa.8hadod la thtolia x C oriesia i valudosa.8hadod la thtolia x C orie			Direction. South of Steep Point Track and old fenceline. [Most sett 12].  Near W edge large birrida c 11km SSW Useless Loop  town. E side hubberneck Rd & W side of side track  through birrida, 0.9km from edge. [Mos bes201].  Side Land. Shark Bay. c, 8.5 km SSF of Mt Direction.	MAN MAN	0	
5263131	17885	Tricella bramarides     Tricella bramarides     Tricella bramarides	4	1		litter, on steeo useer duneslose.  On pale orange-red sandy slit with shell girt and 30% surface cover of litter on NE-Eacing gentle lower slope on lineschone fringing blinds.  On cream sand with shell girt and 20% surface cover of litter, on very gently inclined, EME-Baring.	sp-Rhagodiu spp Low Heath C over Threliseldia differa Dawd Srob C over Grass. Anthocercis littores Acata letragenophylla Open Low Srob B over Artiples paludous spp moquintan-Oleania spp Sacevola spp Dwarf Scrub C over Thrylor paludous Scrub C over Thrylor Dwarf Dwarf Scrub C over Thrylor Dwarf Acaca ligulata Srobielliera Artifela Acaca ligulata Srobielliera Artifela paludous-Artifela littoria R over paludous-Artifela littoria R over paludous- paludous- paludous- paludous- paludous- paludou			Direction, South of Steep Point Track and old fenceline. (Mort dest[12])  Near W edge large birrids c.11km SSW Useless Loop town. Es de Rubberneck Rd & W side of side track through birrids, D.SW mfore ElPost-bora011.  Gdel Land, Shark Bay, c. 8.5 km SSE of Mt Direction, accessed by WMD rack to Thunder Bay, Blowholes &	MAN MAN MAN	0	27/09/199
5263131 5263581 488259	17885 17885 17885	Tricalia bramanides  Tricalia bramanides  Tricalia bramanides  Tricalia bramanides	4	1		Titler, on takes useer dusestools.  On pake orange-red sandy tilt with shell girt and 30% surface cover of litter on NF-facing gentle lower slope on limestone frieging birrida.  On cream sand with shell girt and 20% surface cover of litter, on very gently inclined, DNE-facing lower slopes on the shell girt and 20% surface.  On calkantous sand duries.	sp Albugeda sign Low Health Cover Threliedela dishlat Dearl'Exchic Cover Grass. Anthocercs Nitrose Acasis strategenoshylla Dear Anthocercs Nitrose Acasis strategenoshylla Dear Grand Cover Thrystomene sp Melaleuca cardiophila Dearl and po Cavardia spo Pawal Schic Cover Thrystomene sp Melaleuca cardiophila Dearl Low Health D. Acasis ligidata/modelilitera Melaleuca cardiophila Dearl Low Schill Bower Afrijolov paludosa-Magodia Intrinsi Art. of pressil- ioshinodele Austrostija spp Mid Dense Hummock Grass.			Direction, south of Steep Point Track and old fencilsise. Project central .  Near W edge large brinds c 11km 55W Useless Loop town: 1 self-subbeneck Ris 8 W side of side track inches town from the self-side track.   Index to the self-side brinds and the self-side frack inches the self-side frack inches the self-side brinds and the self-side br	MAN MAN	0	27/09/199 18/09/199 13/08/197
5263131 5263581 488259 387851	17885 17885 17885 17885	Triodia bramades  Triodia bramades  Triodia bramades  Triodia bramades  Triodia bramades	4 4	1	In clumos, flowers staw-oursile.	litter, on steep upper dunestope.  On pale orange-red sandy sit with shell gift and 30% surface cover of litter on NE sheing gentle lower slope on interestingsing bringsing Oncer slope on interestingsing bringsing On cream sand with shell gift and 20% surface cover of litter, on very gently inclined, ENE facing lower dunest lope/swale.	sp Albugeda sign Low Health Cover Threliedela dishlat Dearl'Exchic Cover Grass. Anthocercs Nitrose Acasis strategenoshylla Dear Anthocercs Nitrose Acasis strategenoshylla Dear Grand Cover Thrystomene sp Melaleuca cardiophila Dearl and po Cavardia spo Pawal Schic Cover Thrystomene sp Melaleuca cardiophila Dearl Low Health D. Acasis ligidata/modelilitera Melaleuca cardiophila Dearl Low Schill Bower Afrijolov paludosa-Magodia Intrinsi Art. of pressil- ioshinodele Austrostija spp Mid Dense Hummock Grass.	common.		Directions. South of Steep Point Track and old femoline. Plant Gent 212.  Near W edge large brinds c 113m SSW Useless Loop from E side hubberseck R & W vide of side frack through brinds. (Sim hubberseck R & W vide of side frack through brinds.) Sim humbers (Sim Side of side frack through brinds.) Sim humbers (Sim Side of Net Orienton, secretary 4 HPC Visit in Thursder Biss, Blowholds & Confide Microson Bay, Roy Chebart 11.  Bisde Cridde's Came to Mount Direction & Steep Point Co. 8 Jim W of Homestand. Direction of Steep Point Co. 8 Jim W of Homestand. Direction Bissec Point Co. 8 Jim W of Homestand. Direction Bissec Point Co. 8 Jim W of Homestand. Direction Bissec Point Co. 9 Jim W of Homestand. Direction Bissec Point Co. 9 Jim W of Homestand. Direction Bissec Point Co. 9 Jim W of Homestand. Directional Bissec	MAN MAN	0	27/09/199 18/09/199 13/08/197 3/09/1972
5263131 5263581 488259	17885 17885 17885	Tricalia bramanides  Tricalia bramanides  Tricalia bramanides  Tricalia bramanides	4 4 4	1	In clumos, flowers daw outsile. In clumos, flowers staw outsile.	Titler, on takes useer dusestools.  On pake orange-red sandy tilt with shell girt and 30% surface cover of litter on NF-facing gentle lower slope on limestone frieging birrida.  On cream sand with shell girt and 20% surface cover of litter, on very gently inclined, DNE-facing lower slopes on the shell girt and 20% surface.  On calkantous sand duries.	igo Blagdios got Low Hearth. Cow'th Thisilability and Market Market Market From Commonwell Add Sent House Sent Hearth Cow Market House Sent Hearth Commonwell Add Sent House Sent Hearth Commonwell Add Sent House Hearth Commonwell	common.		Direction, south of Steep Point Track and old fencilsise. Project central .  Near W edge large brinds c 11km 55W Useless Loop town: 1 self-subbeneck Ris 8 W side of side track inches town from the self-side track.   Index to the self-side brinds and the self-side frack inches the self-side frack inches the self-side brinds and the self-side br	MAN MAN	0	27/09/199 18/09/199 13/08/197
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5263131 5263531 482359 482359 1232207 1232207 1232207 1232207 12422	17865 17865	Triodia bramoides  Triodia planterordia  Triodia planterordia	3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	in clumps, flowers straw-purple.  Splinfex. Splinfex. Splinfex. Splinfex. Larger tussock than 7050.  Poussant en touffex hautes de 60 cm.  Povesant grans, deroxly clumped, only - 1 no, flower bright grans. Once thead and stems gren turning purplefed. Caseptose hummond grass, 10 cm splinfex despites grans. Splinfex. Splinfex. Splinfex. Splinfex. Splinfex. Splinfex. Splinfex. Splinfex. Splinfex.	Item or trees upond microstope.  On pair prange-pred sandy sit with shell gift and 20% surface cover of their on NE Acids; gentled bover rising on International Principal States (See See See See See See See See See Se	ip Baydodi spp tow Hearth Cover Thresholds  Inflies Board Frage Leve Text Cover  Low Sou Be Sover Allegian particles and Cover Allegian  Sou Be Sover Allegian particles and Cover Allegian  Soul Cover Thresholds and Cover Allegian  Soul Cover Thresholds and Sover Allegian  Could Cover Thresholds and Sover Allegian  Low Cover Soul Sover Allegian  Machiner Cover Soul Sover Allegian  Medialucus cardiophylia healthout Vegetation  Sover Soul Cover Soul Sover Soul Sover Soul  Medialucus cardiophylia healthout Vegetation  Sover Soul Soul Soul Sover Soul Sover Soul  Medialucus cardiophylia healthout Vegetation  Sover Soul Soul Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Sover Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Sover Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Sover Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Soul Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Soul Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Soul Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Soul Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Soul Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Soul Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Soul Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Soul Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Soul Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Soul Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Soul Soul Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Soul Soul Soul Soul Soul Soul Soul  Medialucus cardiophylia healthout Vegetation  Soul Soul Soul Soul Soul Soul Soul Soul		against Blackall's collecting book M.A. Lewington	Directions, south of Steep Point Track and dolf fencillate.  Plant dest213  Near W edge large birnida c 11km 55W Useless Loop than t. 15th Rubbenick A 68 W 66 of 15th Frack Homes and 15th Rubbenick A 68 W 66 of 15th Frack Homes before Common the 15th Rubbenick A 68 W 66 of 15th Frack Homes before Common the 15th Rubbenick A 68 W 66 of 15th Rubbenick A 65 W 67 of 1	MAN	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27/09/19 18/09/19 18/09/19 13/09/19 13/09/19 13/09/19 14/03/19 14/03/19 15/19/19 15/19/19 15/19/19 15/19/19 15/19/19 15/19/19 15/19/19 15/19/19 15/19/19 15/19/19 15/19/19 15/19/19 15/19/19 15/19/19 15/19/19 15/19/19 15/19/19

heet	Name ID	Taxon	Cons Code	Plant Description	Site	Vegetation	Frequency	Notes	Locality	Geo Method	Precision	Date
				Perennial grass, densely clumped,								
				spiky < 1m; leaves bright green;								
				flower heads and stems green					Opposite Little Lagoon Look Out on Denham/Monkey			
1951548	694	Triodia plurinervata	3	turning purple/red.		Shrubland, Acacia.			Mia road, Peron National Park	AUTO	3	6/06/1991
					West facing slope of fairly large dune; pale (dull)							
					brown sand, fine mixed calcareous and siliceous							
1232738	694	Triodia plurinervata	3		sand with slightly setting surface.	Acacia ligulata shrubland.		Peron site 24.	Peron Peninsula, Shark Bay.	MAN	2	3/11/1989
						Acacia ligulata/rostellifera-Pimelea microcephala Open Low Scrub B over P. microcephala-Atriplex						
						sp-Solanum orbiculatum-Stylobasium						
						sp-solanum orbiculatum-stylobasium spathulatum Dwarf Scrub C over Triodia			Peron Peninsula, Shark Bay. Approximately 6 km ESE of			
						pleurinervata Dense Hummock Grass over Verv			iunction of Eagle Bluff Rd and Denham-Hamelin Rd.			
5250668		Triodia plurinervata	-		On pale red sand on upland plain.	Open Herbs			[Plot-ebwe01.]	MAN		2/10/1997
3230000	03-	Triodia pidrimervata	3	+	On pale red sand on opiano piani.	Open Herbs			[hot-ebwed1.]	MAN	- 0	2/10/1997
						Acacia ligulata/rostellifera-Pimelea microcephala						
						Open Low Scrub B over P. microcephala-Atriplex						
						sp-Solanum orbiculatum-Stylobasium						
						spathulatum Dwarf Scrub C over Triodia			Peron Peninsula, Shark Bay, Approximately 6 km ESE of			
						pleurinervata Dense Hummock Grass over Verv			junction of Eagle Bluff Rd and Denham-Hamelin Rd.			
5250072	694	Triodia plurinervata	3		On pale red sand on upland plain.	Open Herbs			[Plot-ebwe01.]	MAN	0	2/10/1997
						Acacia ligulata Open Low Scrub A over Pimelea						
						microcephala. Ptilotus obovatus and Solanum						
						orbiculare Low Scrub B over Brachycome						
						latisquamea, Thryptomene baeckeacea Open						
						Dwarf Scrub D over Triodia plurinervata Grass			Francois Peron National Park, 4.1 km S of Peron			
5041872	694	Triodia plurinervata	3	Bunch grass.	Low dune, SE aspect. Red sand over sandy clay.	over Brassica tournefortii Open Herbs.			Homestead W of road to Monkey Mia Road. (Site: pe2)	GPS	1	24/08/1994
					Undulating, low dunes. Red-brown calcareous				6 km from Denham towards Hamelin Pool, Irwin			
8083738	694	Triodia plurinervata	3	Hummock grass, in ring.	soil.	Shrubland of Acacia and chenopods.	dominant.		district	GPS	1	10/09/2004

Pop ID	Name ID	Taxon	Cons Status	Pop#	Sub Pop	Location	District	Vesting	Purpose 1	Count Date	In Flower
84588	1210	Acanthocarpus rupestris	2	5		1.8 km approximately south of Useless Loop township and 2.1 km south of Trig Station, Shark Bay. On east side of Useless Loop-Perth Road.	SHARK BAY	NON	UCL	08-10-97	N
94358	18132	Dicrastylis sp. Denham (M. Lewis 42/92)	1	1		Shark Bay Road reserve, 17 km south of Denham on right side of road.	SHARK BAY	MRD	VER	26-09-92	N
93855	17151	Eremophila splendens	1	2		UCL, Ex- Carrarang leasehold, Steep Point area, ca 2.5 km SE of Mount Direction, Shark Bay.	SHARK BAY	EXD	EPL	21-09-97	N
93856	17151	Eremophila splendens	1	3		UCL, Ex- Carrarang leasehold, Steep Point area, ca 5 km SE of Monkey Rock, Shark Bay.	SHARK BAY	EXD	EPL	22-09-97	N
93857	17151	Eremophila splendens	1	4		UCL, Ex- Carrarang leasehold, 7 km SE from Steep Point, at Blackies Beach, [ca 400 m WNW of Ranger Station], Shark Bay.	SHARK BAY	EXD	EPL	31-08-05	Y
94248	17885	Triodia bromoides	4	1		Towards S end of Useless Inlet, on W side. ca 1km S of levee banks for salt evaporators. Carrarang Station.	SHARK BAY	NON	PAS	04-10-89	N
94251	17885	Triodia bromoides	4	2		Towards S end of Useless Inlet, on E side. ca 3.5m NE of E side of levee bank for salt evaporators. Carrarang Station.	SHARK BAY	NON	PAS	31-10-89	N
94253		Triodia bromoides	4	4		ca 6km SE of Steep Point. Carrarang Station.	SHARK BAY	NON	PAS	06-10-89	
103847		Triodia bromoides	4	5	Α	Dirk Hartog Island. 0.8km W of homestead. Pastoral lease 3114/470.	SHARK BAY	NON	PAS	03-09-72	N
103848	17885	Triodia bromoides	4	5	В	Dirk Hartog Island. Near homestead. Loc 62.	SHARK BAY	NON	PAS	17-10-74	N



KINGDOM	01.400	FAMILY	NAME SCI	SUBSPECIES NAME ID	NAME COM	CONS CODE		DAY MO	N. PER I	VEAD	COLUDOR ID	SOURCE	OFFITAINITY	METHOD	TO COLE	0011111	LOCALITY	OUTE	40011040744
Animalia	BIRD			SUBSPECIES NAME_ID 48591	Osprey, Eastern Osprey	IA	12/05/1980			YEAR 1980		BIRDATLAS1	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	18000
Animalia	BIRD	Accipitridae Accipitridae	Pandion cristatus Pandion cristatus	48591	Osprey, Eastern Osprey	IA IA	26/06/1980		6	1980		BIRDATLAST							18000
Animalia	BIRD	Accipitridae	Pandion cristatus  Pandion cristatus	48591	Osprey, Eastern Osprey	IA	3/10/1998		10	1998	450246 241	BIRDATLAS2						Eagle Bluff, Peron Peninsula	500
Animalia	BIRD	Accipitridae	Pandion cristatus Pandion cristatus	48591	Osprey, Eastern Osprey Osprey. Eastern Osprey	IΑ	27/06/2003		6	2003		BIRDATLAS2						Little Lagoon	100
Animalia	BIRD	Accipitridae	Pandion cristatus	48591	Osprey, Eastern Osprey	IA	28/09/2003		9	2003		BIRDATLAS2						Nicholson Point	100
Animalia	BIRD	Accipitridae	Pandion cristatus	48591	Osprey, Eastern Osprey	IA	24/07/2004		7	2004		BIRDATI AS2						Denham Water Authority	100
Animalia	BIRD	Accipitridae	Pandion cristatus	48591	Osprey, Eastern Osprey	IA	14/10/2004		10	2004		BIRDATLAS2						Denham Denham	100
Animalia	BIRD	Accipitridae	Pandion cristatus	48591	Osprey, Eastern Osprey	IA	13/06/2006		6	2006		BIRDATLAS2						Eagle Bluff	0
Animalia	BIRD	Accipitridae	Pandion cristatus	48591	Osprey, Eastern Osprey	IA	4/04/2008	4	4	2008	498551   241	BIRDATLAS2							100
Animalia	BIRD	Accipitridae	Pandion cristatus	48591	Osprey, Eastern Osprey	IA	11/11/2008	11 1	11	2008	5034662   241	BIRDATLAS2						Little Lagoon	100
					greater sand plover, large sand														
Animalia	BIRD	Charadriidae	Charadrius leschenaultii	25575	plover	VU & IA	14/10/1998	14 1	10	1998	1981   141	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Fowlers Camp	5000
Animalia	BIRD	Charadriidae	Charadrius leschenaultii	25575	greater sand plover, large sand	VU & IA	10/09/1999	40	a	1999	67951   141	BIRDATLAS2	Moderately Certain	Observational	Sighting		DENHAM	Little Lagoon Beach, Denham	100
Animalia	BIHD	Charadridae	Charadrius leschenaultii	25575	greater sand plover, large sand	VU & IA	10/09/1999	10	9	1999	6/951 141	BIRDATLA52	ivioderately Certain	Observational	Signting	- 1	DENHAM	Little Lagoon Beach, Dennam	100
Animalia	BIRD	Charadriidae	Charadrius leschenaultii	25575	plover	VU & IA	26/01/2004	26	1	2004	427836 141	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	FRANÇOIS PERON NATIONAL PARK	Eagle Bluff lagoon	100
					greater sand plover, large sand													* *	
Animalia	BIRD	Charadriidae	Charadrius leschenaultii	25575	plover	VU & IA	27/01/2004	27	1	2004	427822   141	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	Little Lagoon Inlet	100
A	BIBD	01	011:11:	OFFIF	greater sand plover, large sand	VI 3 LIV	0 (40 (000 4		10	0004	40000001444	DIDDATI ACO	Madagard Control	01	On the second		SHARK BAY	Laurent State	400
Animalia	RIHD	Charadriidae	Charadrius leschenaultii	25575	plover greater sand plover, large sand	VU & IA	9/10/2004	9	10	2004	432839   141	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	SHAHK BAY	Lagoon inlet	100
Animalia	BIRD	Charadriidae	Charadrius leschenaultii	25575	plover	VU & IA	12/10/2004	12 1	10	2004	435443   141	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Lookout	100
Animalia	BIRD	Charadriidae	Charadrius leschenaultii	25575	Greater Sand Plover	VU & IA	16/10/2007	16 1	10	2007	1783609 141	BIRDATA	,		0 0			Big Lagoon	0
					greater sand plover, large sand														
Animalia	BIRD	Charadriidae	Charadrius leschenaultii	25575	plover	VU & IA	11/11/2008		11	2008		BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	LITTLE IAGOON	100
Animalia	BIRD	Charadriidae	Charadrius leschenaultii	25575	Greater Sand Plover	VU & IA	4/08/2014		8	2014	1318063   141							Eagle Bluff SB	0
Animalia	BIRD	Charadriidae	Charadrius leschenaultii	25575	Greater Sand Plover	VU & IA	18/02/2015		2	2015	1783599   141							Little Lagoon	0
Animalia	BIRD	Charadriidae	Charadrius leschenaultii	25575	Greater Sand Plover	VU & IA	20/02/2015		2	2015	1783611   141							Big Lagoon	0
Animalia	BIRD	Charadriidae	Charadrius mongolus	25576	lesser sand plover	EN & IA	10/09/1999		9	1999		BIRDATLAS2		Observational		1	DENHAM	Little Lagoon Beach, Denham	100
Animalia	BIRD	Charadriidae	Charadrius mongolus	25576	lesser sand plover	EN & IA	13/12/1999		12	1999		BIRDATLAS2		Observational		1	DENHAM	Denham	500
Animalia	BIRD	Charadriidae	Charadrius mongolus	25576	lesser sand plover	EN & IA	27/01/2004		1	2004	427822 139	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	Little Lagoon Inlet	100
Animalia	BIRD	Charadriidae	Charadrius mongolus	25576	Lesser Sand Plover	EN & IA	16/10/2007		10	2007		BIRDATA						Little Lagoon	0
Animalia	BIRD BIRD	Charadriidae	Charadrius mongolus	25576	Lesser Sand Plover Lesser Sand Plover	EN & IA	14/08/2014		8	2014		BIRDATA						Eagle Bluff SB	0
Animalia Animalia	BIRD	Charadriidae	Charadrius mongolus	25576	Lesser Sand Plover	EN & IA	15/08/2014		2	2014		BIRDATA						Eagle Bluff SB	0
	BIRD	Charadriidae	Charadrius mongolus	25576 25576	Lesser Sand Plover	EN & IA	18/02/2015 2/06/2017		_	2015	1783599 139	BIRDATA						Little Lagoon	0
Animalia Animalia	BIRD	Charadriidae Charadriidae	Charadrius mongolus	25576	grey plover	EN & IA	1/12/1916	_	6 12	1916		WAM BIRDS	WAM Vouchered	Collection	Specimen		FRANCOIS PERON NATIONAL PARK	Eagle Bluff lagoon/beach Peron; Shark Bay	10000
Animalia	BIRD	Charadriidae	Pluvialis squatarola Pluvialis squatarola	24383	Grey Plover	IA IA	1/12/1916		12	1916		WAM BIRDS	VVAIVI Voucnered	Collection	Specimen	- 1	FHANCOIS PERON NATIONAL PARK	Peron; Shark Bay Peron: Shark Bay	10000
Animalia	BIRD	Charadriidae	Pluvialis squatarola	24383	grey plover	IA	8/05/1979	0	12 E	1979	59665   136	BIRDATLAS1	Moderately Certain	Observational	Cinhtina	- 1	FRANÇOIS PERON NATIONAL PARK	FRANCOIS PERON NATIONAL PARK	18000
Animalia	BIRD	Charadriidae	Pluvialis squatarola Pluvialis squatarola	24383	grey plover	IA IA	26/06/1980	26	6	1979		BIRDATLAST	Moderately Certain	Observational	Sighting Sighting	1	FRANCOIS PERON NATIONAL PARK	FRANCOIS PERON NATIONAL PARK	18000
Animalia	BIRD	Charadriidae		24383	grey plover	IA	26/01/2004		1	2004		BIRDATLAS2			Sighting	1	FRANÇOIS PERON NATIONAL PARK	Eagle Bluff lagoon	100
Animalia	BIRD	Charadriidae	Pluvialis squatarola Pluvialis squatarola	24383	grey plover	IA IA	27/01/2004		1	2004		BIRDATLAS2	Moderately Certain Moderately Certain	Observational Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	Little Lagoon Inlet	100
Animalia	BIRD	Charadriidae	Pluvialis squatarola	24383	grey plover	IA	11/10/2004		10	2004	435441   136		Moderately Certain	Observational	Sighting	1	DENHAM	Little Lagoon	100
Animalia	BIRD	Charadriidae	Pluvialis squatarola	24383	grey plover	IA	12/10/2004		10	2004		BIRDATI AS2	Moderately Certain	Observational	Sighting	1	DENHAM	Lookout	100
Animalia	BIRD	Charadriidae	Pluvialis squatarola	24383	Grey Plover	IA	16/10/2007		10	2007		BIRDATA	woodrately ourtain	Obder vational	Oigning		DEITINA	Little Lagoon	0
Animalia	BIRD	Charadriidae	Pluvialis squatarola	24383	Grey Plover	IA	16/10/2007		10	2007	1783608   136							Big Lagoon	0
Animalia	BIRD	Charadriidae	Pluvialis squatarola	24383	grey plover	IA	11/08/2007	11	8	2007	491086 136	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	FRANÇOIS PERON NATIONAL PARK	Eagle Bluff	100
Animalia	BIRD	Charadriidae	Pluvialis squatarola	24383	Grey Plover	IA	22/12/2014		12	2014	1553375 136							Little Lagoon, Denham	0
Animalia	BIRD	Charadriidae	Pluvialis squatarola	24383	Grey Plover	IA	18/02/2015	18	2	2015	1783599   136	BIRDATA						Little Lagoon	0
Animalia	BIRD	Charadriidae	Pluvialis squatarola	24383	Grey Plover	IA	20/02/2015	20	2	2015	1783611   136	BIRDATA						Big Lagoon	0
Animalia	BIRD	Hydrobatidae	Oceanites oceanicus	24497	Wilson's storm-petrel	IA	12/11/2008	12 1	11	2008	780870   63	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	SHARK BAY	Shark Bay	0
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	6/08/1977	6	8	1977	3401   112	BIRDATLAS1							18000
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	12/05/1980	12	5	1980		BIRDATLAS1							18000
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	26/06/1980	26	6	1980	89432   112	BIRDATLAS1							18000
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	30/06/1980	30	6	1980	89660   112	BIRDATLAS1							18000
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	15/06/1999		6	1999		BIRDATLAS2						Near Little Lagoon	100
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	10/09/1999		9	1999		BIRDATLAS2						Little Lagoon Beach, Denham	100
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	13/12/1999		12	1999		BIRDATLAS2						Denham	500
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	29/03/2002		3	2002	275788   112							Nicholson Point	100
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA.	28/09/2003		9	2003		BIRDATLAS2						Nicholson Point	100
Animalia	BIRD BIRD	Laridae	Hydroprogne caspia	48587 48587	Caspian Tern Caspian Tern	IA.	29/01/2004		1	2004		BIRDATLAS2						Coastal Quarry	100
Animalia Animalia	BIRD	Laridae	Hydroprogne caspia	48587 48587	Caspian Tern Caspian Tern	IA IA	9/10/2004		10	2004	432839   112	BIRDATLAS2 BIRDATLAS2						Lagoon inlet	100
Animalia	BIRD	Laridae Laridae	Hydroprogne caspia	48587 48587	Caspian Tern Caspian Tern	IA IA	12/10/2004		10	2004		BIRDATLAS2						Litle Lagoon	100
Animalia	BIRD	Laridae	Hydroprogne caspia Hydroprogne caspia	48587	Caspian Tern	IA IA	14/10/2004		10	2004		BIRDATLAS2						Denham	100
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	16/10/2004		10	2004		BIRDATA						Little Lagoon	0
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	16/10/2007		10	2007	1792336 112							Eagle Bluff Lagoon	0
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	16/10/2007		10	2007		BIRDATA						Eagle Bluff Lagoon	0
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	16/10/2007		10	2007		BIRDATA						Little Lagoon	0
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	11/08/2007		8	2007		BIRDATLAS2						Eagle Bluff	100
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	4/04/2008		4	2008	498551   112	BIRDATLAS2						<u> </u>	100
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	11/11/2008		11	2008		BIRDATLAS2						Little Lagoon	100
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	14/06/2011	14	6	2011	1405950   112	BIRDATA						Little Lagoon at 25 54 13S 113 32 11E	100
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	14/07/2011	14	7	2011	1218966   112	BIRDATA						eagle bluff	0
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	12/07/2013		7	2013	1783596   112							Little Lagoon	0
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	17/10/2013	17 1	10	2013	1498704 112	BIRDATA						Eagle Bluff, Shark Bay	0
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	4/08/2014	4	8	2014	1318063   112	BIRDATA						Eagle Bluff SB	0
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	15/08/2014	15	8	2014	1318064   112	BIRDATA						Eagle Bluff SB	0
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	18/02/2015	18	2	2015	1783599   112	BIRDATA						Little Lagoon	0
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	20/02/2015		2	2015	1783611 112							Big Lagoon	0
Animalia	BIRD	Laridae	Hydroprogne caspia	48587	Caspian Tern	IA	19/06/2017		6	2017	1995059   112							Shark Bay Eagle Bluff Lagoon	0
Animalia	BIRD	Laridae	Onychoprion anaethetus	41347	Bridled Tern	IA	4/02/2013		2	2013	1364796   121							Eagle Bluff	500
Animalia	BIRD	Laridae	Sterna hirundo	25642	Common Tern	IA	28/09/2014		9	2014	1558530 953							Little Lagoon, Denham	0
Animalia	BIRD	Laridae	Sterna hirundo	25642	Common Tern	IA	18/02/2015		2	2015	1783599   953							Little Lagoon	0
Animalia	BIRD	Laridae	Thalasseus bergii	0	crested tern	IA	14/03/1977	14	3	1977	3470   115	BIRDATLAS1	Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	FRANCOIS PERON NATIONAL PARK	18000



KINGDOM	CLASS	FAMILY	NAME COL	CURCECIEC	MANUE ID	NAME COM	COME CODE	DATE DA	V MONTH	VEAD	COLUDOR ID	COLUDOR	CERTAINITY	METHOD	TVDE /	COUNT LOCALITY	SITE	ACCURACY M
Animalia	BIRD	Laridae	NAME_SCI Thalasseus bergii	SUBSPECIES	NAME_ID	crested tern	CONS CODE	DATE DA 17/03/1977 17	Y MONTH	YEAR 1977		SOURCE BIRDATLAS1	CERTAINTY  Moderately Certain	METHOD Observational	TYPE ( Sighting	1 FRANCOIS PERON NATIONAL PARK		18000
Animalia	BIRD	Laridae	Thalasseus bergii		0	crested tern	IA	14/10/1998 14		1998		BIRDATLAS2	Moderately Certain	Observational	Sighting	1 DENHAM	Fowlers Camp	5000
Animalia	BIRD	Laridae	Thalasseus bergii		0	crested tern	IA	30/03/1999 30		1999		BIRDATLAS2	Moderately Certain	Observational	Sighting	1 FRANÇOIS PERON NATIONAL PARK	Shark Bay, via Denham	5000
Animalia	BIRD	Laridae	Thalasseus bergii		0	crested tern	IA	10/09/1999 10		1999	67951   115	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 DENHAM	Little Lagoon Beach, Denham	100
Animalia	BIRD	Laridae	Thalasseus bergii		0	crested tern	IA	29/03/2002 29	3	2002	275788 115	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 DENHAM	Nicholson Point	100
Animalia	BIRD	Laridae	Thalasseus bergii		0	crested tern	IA	1/11/2002 1	11	2002	283680   115	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 DENHAM	Denham	1000
Animalia	BIRD	Laridae	Thalasseus bergii		0	crested tern	IA	27/01/2004 27		2004	427822   115	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 FRANCOIS PERON NATIONAL PARK	Little Lagoon Inlet	100
Animalia	BIRD	Laridae	Thalasseus bergii		0	crested tern	IA	12/05/2004 12	2 5	2004	438364   115	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 FRANCOIS PERON NATIONAL PARK	Eagles Bluff	100
Animalia	BIRD	Laridae	Thalasseus bergii		0	crested tern	IA	9/10/2004 9	10	2004	432839   115	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 SHARK BAY	Lagoon inlet	100
Animalia	BIRD	Laridae	Thalasseus bergii		0	crested tern	IA	11/10/2004 11	10	2004	435441   115	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 DENHAM	Litle Lagoon	100
Animalia	BIRD	Laridae	Thalasseus bergii		0	crested tern	IA	14/10/2004 14	10	2004	435445   115	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 DENHAM	Denham	100
Animalia	BIRD	Laridae	Thalasseus bergii		48597	Crested Tern	IA	16/10/2007 16		2007	1792556   115						Little Lagoon	0
Animalia	BIRD	Laridae	Thalasseus bergii		0	crested tern	IA	11/08/2007 11		2007	491086   115		Moderately Certain	Observational	Sighting	1 FRANCOIS PERON NATIONAL PARK	Eagle Bluff	100
Animalia	BIRD	Laridae	Thalasseus bergii		0	crested tern	IA	12/11/2008 12	2 11	2008	5032854   115	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 SHARK BAY	Big Lagoon	100
Animalia	BIRD	Laridae	Thalasseus bergii		48597	Crested Tern	IA	4/02/2013 4		2013	1364796   115						Eagle Bluff	500
Animalia	BIRD	Laridae	Thalasseus bergii		48597	Crested Tern	IA	18/02/2015 18		2015	1783599   115						Little Lagoon	0
Animalia	BIRD	Laridae	Thalasseus bergii		48597	Crested Tern	IA	20/02/2015 20	_	2015	1783611   115						Big Lagoon	0
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	0		0		MCB UP FAUN					PE2	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	0		0	13596	MCB UP FAUN					PE3	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	0		0	13597	MCB UP FAUN					PE4	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis	1	25648	Thick-billed Grasswren	P4	0		0	13598	MCB UP FAUN	A				PE5	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648 25648	Thick-billed Grasswren Thick-billed Grasswren	P4 P4	14/06/1977 14		1977		BIRDATLAS1			<del>                                     </del>			18000 18000
Animalia Animalia	BIRD	Maluridae Maluridae	Amytornis textilis textilis	textilis	25648 24541	Nestern grasswren	P4 P4	11/08/1977 11 20/11/1982 20		1977 1982		BIRDATLAS1 WAM BIRDS	WAM Vouchered	Collection	Caraina	1 FRANÇOIS PERON NATIONAL PARK	Denham, 6 km NNE of	18000
Animalia	BIRD	Maluridae Maluridae	Amytornis textilis textilis	_	24541	western grasswren western grasswren	P4 P4	20/11/1982 20		1982		WAM BIRDS	WAM Vouchered WAM Vouchered	Collection	opecimen	1 FRANCOIS PERON NATIONAL PARK 1 FRANCOIS PERON NATIONAL PARK	Denham, 6 km NNE of Denham, 6 km NNE of	10000
Animalia	DIHD	iviaiuridae	Amytornis textilis textilis	textilis	24541	Western grasswren Western Grasswren, Thick-billed	P4	20/11/1982 20	11	1982	Avil:17/04	WAIN BIRDS	vvAIVI vouchered	Collection	Specimen	I PHANCOIS PERON NATIONAL PARK	Dennam, 6 km NNE of	10000
Animalia	BIRD	Maluridae	Amytornis textilis textilis	textilis	24541	Grasswren (western)	P4	20/11/1982 20	11	1982	onomy.org au	WAM BIRDS					Denham, 6 km NNE of	10000
. ummana		TVIGIGITIGAC	. wity so that to to the	SCOTE III	2-10-11	Western Grasswren, Thick-billed												
Animalia	BIRD	Maluridae	Amytornis textilis textilis	textilis	24541	Grasswren (western)	P4	20/11/1982 20		1982		A WAM_BIRDS					Denham, 6 km NNE of	10000
Animalia	BIRD	Maluridae	Amytornis textilis textilis	textilis	24541	western grasswren	P4	30/01/1985 30	1	1985	AVIF:19358	WAM BIRDS	WAM Vouchered	Collection	Specimen	1 FRANCOIS PERON NATIONAL PARK	Denham, 5 km E of	10000
						Western Grasswren, Thick-billed						1						
Animalia	BIRD	Maluridae	Amytornis textilis textilis	textilis	24541	Grasswren (western)	P4	30/01/1985 30		1985		WAM_BIRDS					Denham, 5 km E of	10000
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	10/10/1998 10		1998		BIRDATLAS2					Peron Peninsula	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	11/10/1998 11		1998		BIRDATLAS2					Peron Peninsula	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	11/10/1998 11		1998		BIRDATLAS2					Peron Peninsula	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648 25648	Thick-billed Grasswren	P4	12/06/1999 12		1999		BIRDATLAS2					Big Lagoon	100
Animalia		Maluridae	Amytornis textilis textilis			Thick-billed Grasswren Thick-billed Grasswren	P4	27/08/1999 27		1999		BIRDATLAS2					Denham Road, Peron Peninsula	5000
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren Thick-billed Grasswren	P4	27/08/1999 27		1999	84421   512	BIRDATLAS2					François Peron Homestead	5000
Animalia		Maluridae	Amytornis textilis textilis		25648		P4	10/09/1999 10		1999		BIRDATLAS2					Little Lagoon, Denham	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648 25648	Thick-billed Grasswren Thick-billed Grasswren	P4	11/09/1999 11		1999		BIRDATLAS2					3km NE of Denham	100
Animalia Animalia	BIRD	Maluridae Maluridae	Amytornis textilis textilis Amytornis textilis textilis		25648 25648	Thick-billed Grasswren Thick-billed Grasswren	P4 P4	1/04/2002 1 28/09/2003 28	_	2002 2003		BIRDATLAS2 BIRDATLAS2					Peron Stn North Heath	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	25/01/2004 25		2003		BIRDATLAS2					Tip Boad	100
Animalia	BIRD	Maluridae			25648	Thick-billed Grasswren	P4	26/01/2004 25		2004		BIRDATLAS2					Tip Rd - Denham	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	28/01/2004 28		2004		BIRDATLAS2					Cape Peron	500
Animalia	BIRD	Maluridae			25648	Thick-billed Grasswren	P4	29/01/2004 29		2004	427830 512	+					Coastal Quarry	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	4/04/2004 4		2004		BIRDATLAS2					Peron Homestead	500
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	5/04/2004 5		2004		BIRDATLAS2					Homestead West	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	17/07/2004 17		2004		BIRDATLAS2					Peron Visitors Centre	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	18/07/2004 18		2004		BIRDATLAS2					Peron Visitors Centre	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	19/07/2004 19		2004		BIRDATLAS2					Peron Homestead	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	21/07/2004 21		2004		BIRDATLAS2					Peron Homestead	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	7/10/2004 7		2004		BIRDATLAS2					Peron	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	11/10/2004 11		2004		BIRDATLAS2					Peron Homestead	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	12/10/2004 12		2004		BIRDATLAS2					Peron Homestead	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	14/10/2004 14		2004		BIRDATLAS2					Denham	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	14/10/2004 14		2004		BIRDATLAS2					Peron Homestead	100
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	17/05/2006 17		2006		BIRDATLAS2					Peron Hstd	0
Animalia	BIRD	Maluridae	Amytomis textilis textilis		25648	Thick-billed Grasswren	P4	25/05/2006 25		2006		BIRDATLAS2					Peron Stn, Shark Bay	0
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	16/10/2013 16	10	2013	1498705   512	BIRDATA					Little Lagoon, Denham	0
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	17/08/2015 17	8	2015	1576246   512	BIRDATA					National Park25.8647x113.5513 - 1	0
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	17/08/2015 17		2015	1576253   512						National Park25.8219x113.5454 - 1	0
Animalia	BIRD	Maluridae	Amytornis textilis textilis		25648	Thick-billed Grasswren	P4	26/08/2015 26	8	2015	1326387   512	BIRDATA					Shark Bay: DenhamLittle Lagoon	0
Animalia	BIRD	Megapodiidae	Leipoa ocellata		24557	malleefowl	VU	28/01/2004 28	3 1	2004	427829 7	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 FRANCOIS PERON NATIONAL PARK	Cape Peron	500
Animalia	BIRD	Megapodiidae	Leipoa ocellata		24557	malleefowl	VU	19/07/2004 19	7	2004	424917 7	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 FRANCOIS PERON NATIONAL PARK	Peron Homestead	100
Animalia	BIRD	Megapodiidae	Leipoa ocellata	<u> </u>	24557	malleefowl	VU	21/07/2004 21		2004	424922   7	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 FRANCOIS PERON NATIONAL PARK	Peron Homestead	100
Animalia	BIRD	Megapodiidae	Leipoa ocellata		24557	malleefowl	VU	7/10/2004 7		2004	432840 7	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 FRANCOIS PERON NATIONAL PARK	Peron	100
Animalia	BIRD	Megapodiidae	Leipoa ocellata		24557	malleefowl	VU	11/10/2004 11		2004	435431   7		Moderately Certain	Observational	Sighting	1 FRANCOIS PERON NATIONAL PARK	Peron Homestead	100
Animalia	BIRD	Megapodiidae	Leipoa ocellata		24557	malleefowl	VU	12/10/2004 12		2004	435433   7	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 FRANCOIS PERON NATIONAL PARK	Peron Homestead	100
Animalia	BIRD	Megapodiidae	Leipoa ocellata		24557	malleefowl	VU	14/10/2004 14		2004	435446 7	BIRDATLAS2	Moderately Certain	Observational	Sighting	1 FRANCOIS PERON NATIONAL PARK	Peron Homestead	100
Animalia	BIRD	Megapodiidae	Leipoa ocellata		24557	Malleefowl	VU	23/08/2017 23		2017	1984358 7	+					Denham-Monkey Mia Road	500
Animalia	BIRD	Scolopacidae	Actitis hypoleucos	1	41323	Common Sandpiper	IA	25/01/2004 25		2004		BIRDATLAS2					Denham Waterworks	0
Animalia	BIRD	Scolopacidae	Actitis hypoleucos		41323	Common Sandpiper	IA	25/01/2004 25		2004		BIRDATLAS2					Little Lagoon	100
Animalia	BIRD	Scolopacidae	Actitis hypoleucos	1	41323	Common Sandpiper	IA	26/01/2004 26		2004		BIRDATLAS2					Eagle Bluff	100
Animalia	BIRD	Scolopacidae	Actitis hypoleucos		41323	Common Sandpiper	IA	27/01/2004 27		2004		BIRDATLAS2					Little Lagoon Inlet	100
Animalia	BIRD	Scolopacidae	Actitis hypoleucos	1	41323	Common Sandpiper	IA	9/10/2004 9		2004		BIRDATLAS2					Lagoon inlet	100
Animalia	BIRD	Scolopacidae	Actitis hypoleucos		41323	Common Sandpiper	IA	11/10/2004 11		2004	435441   157						Litle Lagoon	100
Animalia	BIRD	Scolopacidae	Actitis hypoleucos	1	41323	Common Sandpiper	IA	16/10/2007 16		2007	1783592   157						Little Lagoon	0
Animalia	BIRD	Scolopacidae	Actitis hypoleucos		41323	Common Sandpiper	IA	11/11/2008 11		2008		BIRDATLAS2					Little Lagoon	100
Animalia	BIRD	Scolopacidae	Actitis hypoleucos	1	41323	Common Sandpiper	IA	11/11/2008 11		2008		BIRDATLAS2					LITTLE IAGOON	100
Animalia	BIRD	Scolopacidae	Actitis hypoleucos		41323	Common Sandpiper	IA	13/11/2008 13		2008	5032860   157						Denham Lookout	100
Animalia	BIRD	Scolopacidae	Actitis hypoleucos	1	41323	Common Sandpiper	IA	8/09/2013 8		2013		BIRDATA					Little Lagoon, Denham	0
Animalia	BIRD	Scolopacidae	Actitis hypoleucos	+	41323	Common Sandpiper	IA	28/09/2014 28		2014		BIRDATA					Little Lagoon, Denham	0
Animalia	BIRD	Scolopacidae	Actitis hypoleucos	1	41323	Common Sandpiper	IA	28/09/2014 28	9	2014	1558531   157	BIRDATA					Little Lagoon, Denham	0



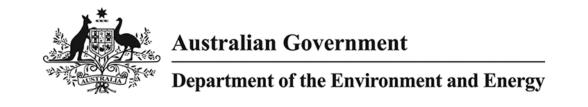
KINODOM	OLAGO	FAMILY	NAME SCI	SUBSPECIES NAME I	D NAME COM	CONS CODE	DATE	DAY	MONTH	YEAR	SOURCE ID	SOURCE	CERTAINTY	METHOD	TVDE	COLIN	IT LOCALITY	SITE	ACCUBACY M
Animalia	BIRD		Actitis hypoleucos	41323		IA	17/11/2014				1319492   157		CERTAINTY	METHOD	TYPE	COOR	II EOCALITY	Denham	0
Animalia	BIRD	Scolopacidae	Actitis hypoleucos	41323	Common Sandpiper	IA IA	22/12/2014		12	2014	1553375   157							Little Lagoon, Denham	0
Animalia	BIRD	Scolopacidae	Arenaria interpres	25736	ruddy turnstone	IA	6/08/1977	6	0	1977	3401   129	BIRDATLAS1	Moderately Certain	Observational	Sighting	1	FRANÇOIS PERON NATIONAL PARK	FRANCOIS PERON NATIONAL PARK	18000
Animalia	BIRD	Scolopacidae	Arenaria interpres	25736	ruddy turnstone	IA	12/05/1980	12	5	1980	89430   129	BIRDATI AS1		Observational	Sighting	1	FRANÇOIS PERON NATIONAL PARK		18000
Animalia	BIRD	Scolopacidae	Arenaria interpres	25736	ruddy turnstone	IA	26/06/1980			1980	89432   129		Moderately Certain	Observational		1		FRANCOIS PERON NATIONAL PARK	
Animalia	BIRD	Scolopacidae	Arenaria interpres	25736	ruddy turnstone	IA	30/06/1980		6	1980	89660   129	BIRDATI AS1	Moderately Certain	Observational	Sighting	1		FRANCOIS PERON NATIONAL PARK	18000
Animalia	BIRD	Scolopacidae	Arenaria interpres	25736	ruddy turnstone	IA	14/10/1998		10	1998	1981   129	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Fowlers Camp	5000
Animalia	BIRD	Scolopacidae	Arenaria interpres	25736	ruddy turnstone	IA	30/03/1999	30	3	1999	25583   129	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	Shark Bay, via Denham	5000
Animalia	BIRD	Scolopacidae	Arenaria interpres	25736	ruddy turnstone	IA	1/11/2002	1	11	2002	283680   129	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Denham	0
Animalia	BIRD	Scolopacidae	Arenaria interpres	25736	ruddy turnstone	IA	27/01/2004	27	1	2004	427822   129	BIRDATLAS2	Moderately Certain	Observational		1	FRANCOIS PERON NATIONAL PARK	Little Lagoon Inlet	100
Animalia	BIRD	Scolopacidae	Calidris acuminata	24779	sharp-tailed sandpiper	IA	1/11/2002	1	11	2002	283680   163	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Denham	0
Animalia	BIRD	Scolopacidae	Calidris acuminata	24779	Sharp-tailed Sandpiper	IA	18/02/2015	18	2	2015	1783599   163	BIRDATA			T T			Little Lagoon	0
Animalia	BIRD	Scolopacidae	Calidris alba	24780	sanderling	IA	8/05/1979	8	5	1979	59665   166	BIRDATLAS1	Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	FRANCOIS PERON NATIONAL PARK	18000
Animalia	BIRD	Scolopacidae	Calidris alba	24780	sanderling	IA	9/09/2001	9	9	2001	190594   166	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Little lagoon	500
Animalia	BIRD	Scolopacidae	Calidris alba	24780	Sanderling	IA	14/08/2014	14	8	2014	1318066   166	BIRDATA						Eagle Bluff SB	0
Animalia	BIRD	Scolopacidae	Calidris canutus	25738	red knot	EN & IA	27/01/2004	27	1	2004	427822   164	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	Little Lagoon Inlet	100
Animalia	BIRD	Scolopacidae	Calidris canutus	25738	red knot	EN & IA	16/10/2007	16	10	2007	1792556   164	BIRDATA						Little Lagoon	0
Animalia	BIRD	Scolopacidae	Calidris canutus	25738	red knot	EN & IA	18/02/2015	18	2	2015	1783599   164	BIRDATA						Little Lagoon	0
Animalia	BIRD	Scolopacidae	Calidris ferruginea	24784	curlew sandpiper	CR & IA	12/03/1964		3	1964	AVIF:9554	WAM BIRDS	WAM Vouchered	Collection	Specimen	1	DENHAM	nham, 0.5 km N of; Entrance to Little Lag	go O
Animalia	BIRD	Scolopacidae	Calidris ferruginea	24784	curlew sandpiper	CR & IA	12/03/1964		3	1964	AVIF:9555	WAM BIRDS		Collection	Specimen	1		nham, 0.5 km N of; Entrance to Little Lag	
Animalia	BIRD	Scolopacidae	Calidris ferruginea	24784	curlew sandpiper	CR & IA	12/03/1964	12	3	1964	AVIF:9556	WAM BIRDS	WAM Vouchered	Collection	Specimen	1	DENHAM	nham, 0.5 km N of; Entrance to Little Lag	go O
Animalia	BIRD	Scolopacidae	Calidris ferruginea	24784	Curlew Sandpiper	CR & IA	12/03/1964		3	1964	xonomy.org.au:	WAM BIRDS						nham, 0.5 km N of; Entrance to Little Lag	
Animalia	BIRD	Scolopacidae	Calidris ferruginea	24784	Curlew Sandpiper	CR & IA	12/03/1964		3	1964		WAM_BIRDS						nham, 0.5 km N of; Entrance to Little Lag	
Animalia	BIRD	Scolopacidae	Calidris ferruginea	24784	Curlew Sandpiper	CR & IA	12/03/1964		3	1964		WAM_BIRDS						nham, 0.5 km N of; Entrance to Little Lag	-
Animalia	BIRD	Scolopacidae	Calidris ferruginea	24784	curlew sandpiper	CR & IA	13/12/1999			1999	60148   161	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Denham	500
Animalia	BIRD	Scolopacidae	Calidris ferruginea	24784	Curlew Sandpiper	CR & IA	16/10/2007		10	2007	1783609   161							Big Lagoon	0
Animalia	BIRD	Scolopacidae	Calidris ferruginea	24784	Curlew Sandpiper	CR & IA	20/02/2015		2	2015	1783611   161	BIRDATA		1				Big Lagoon	0
Animalia	BIRD	Scolopacidae	Calidris ruficollis	24788	red-necked stint	IA	30/06/1980		6	1980	89660   162	BIRDATLAS1	Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK		18000
Animalia	BIRD	Scolopacidae	Calidris ruficollis	24788	red-necked stint	IA	14/10/1998			1998	1981   162	BIRDATLAS2	,	Observational	Sighting	1	DENHAM	Fowlers Camp	5000
Animalia	BIRD	Scolopacidae	Calidris ruficollis	24788	red-necked stint	IA	1/11/2002		11	2002		BIRDATLAS2		Observational	0 0	1	DENHAM	Denham	0
Animalia	BIRD	Scolopacidae	Calidris ruficollis	24788	red-necked stint	IA	27/06/2003		6	2003	416862 162	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Little Lagoon	100
Animalia	BIRD	Scolopacidae	Calidris ruficollis	24788	red-necked stint	IA	26/01/2004		1	2004	427835   162			Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	Eagle Bluff	100
Animalia	BIRD	Scolopacidae	Calidris ruficollis	24788	red-necked stint	IA	26/01/2004			2004		BIRDATLAS2		Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	Eagle Bluff lagoon	100
Animalia Animalia	BIRD	Scolopacidae	Calidris ruficollis Calidris ruficollis	24788 24788	red-necked stint red-necked stint	IA IA	27/01/2004		1	2004	42/822 162	BIRDATLAS2 BIRDATLAS2	Moderately Certain  Moderately Certain	Observational Observational	55	1	FRANCOIS PERON NATIONAL PARK FRANCOIS PERON NATIONAL PARK	Little Lagoon Inlet	100
		Scolopacidae							5	-		+	,		Sighting	1		Eagles Bluff	
Animalia Animalia	BIRD	Scolopacidae	Calidris ruficollis	24788 24788	red-necked stint Red-necked Stint	IA IA	9/10/2004		10	2004	432839   162 1468567   162		Moderately Certain	Observational	Sighting	- 1	SHARK BAY	Lagoon inlet	100
Animalia	BIRD	Scolopacidae Scolopacidae	Calidris ruficollis Calidris ruficollis	24/88	Red-necked Stint	IA IA	16/10/2007			2007	1468567   162	+			-			Eagle tidal lake	0
Animalia	BIRD		Calidris ruficollis  Calidris ruficollis	24788	red-necked stint	IA IA	11/08/2007		8	2007	491086 162	BIRDATLAS2	M. I. and O. dai	01	0:1:::		FRANÇOIS PERON NATIONAL PARK	Big Lagoon Eagle Bluff	100
Animalia	BIRD	Scolopacidae Scolopacidae	Calidris ruficollis	24788	red-necked stint	IA IA	11/11/2008			2007		BIRDATLAS2		Observational Observational	Sighting	1	DENHAM	Little Lagoon	100
Animalia	BIRD	Scolopacidae	Calidris ruficollis	24788	red-necked stint	IA IA	13/11/2008			2008		BIRDATLAS2		Observational	Sighting Sighting	1	DENHAM	Denham Lookout	100
Animalia	BIRD	Scolopacidae	Calidris ruficollis	24788	Red-necked Stint	IA IA	21/08/2012			2012	1783610   162		Moderately Certain	Observational	Signting		DENHAM	Big Lagoon	0
Animalia	BIRD	Scolopacidae	Calidris ruficollis	24788	Red-necked Stint	IA IA	18/02/2015		2	2012	1783599 162							Little Lagoon	0
Animalia	BIRD	Scolopacidae	Calidris ruficollis	24788	Bed-necked Stint	IΔ	20/02/2015		2	2015	1783611   162	+						Big Lagoon	0
Animalia	BIRD	Scolopacidae	Calidris tenuirostris	24790	great knot	CR & IA	8/05/1979		-	1979	59665   165		Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK		18000
Animalia	BIRD	Scolopacidae	Calidris tenuirostris	24790	great knot	CR & IA	13/12/1999			1999	60148   165			Observational		1	DENHAM	Denham	500
Animalia	BIRD	Scolopacidae	Calidris tenuirostris	24790		CR & IA	1/04/2002		4	2002	275809 165		Moderately Certain	Observational	Sighting	1	DENHAM	Mangrove beach	100
Animalia	BIRD	Scolopacidae	Calidris tenuirostris	24790	great knot	CR & IA	28/09/2003		9	2002	444424   165		Moderately Certain	Observational	Sighting	1	SHARK BAY	Nicholson Point	100
Animalia	BIRD	Scolopacidae	Calidris tenuirostris	24790	great knot	CR & IA	26/01/2004		1	2004	427836 165			Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	Eagle Bluff lagoon	100
Animalia	BIRD	Scolopacidae	Calidris tenuirostris	24790	great knot	CR & IA	27/01/2004			2004		BIRDATLAS2	,	Observational		1	FRANÇOIS PERON NATIONAL PARK	Little Lagoon Inlet	100
Animalia	BIRD	Scolopacidae	Calidris tenuirostris	24790	great knot	CR & IA	11/10/2004		10	2004	435441   165	BIRDATLAS2		Observational	Sighting	1	DENHAM	Litle Lagoon	100
Animalia	BIRD	Scolopacidae	Calidris tenuirostris	24790	Great Knot	CR & IA	16/10/2007		10	2007	1792556   165	+			99			Little Lagoon	0
Animalia	BIRD	Scolopacidae	Calidris tenuirostris	24790	Great Knot	CR & IA	16/10/2007	16	10	2007	1783591   165	BIRDATA						Little Lagoon	0
Animalia	BIRD	Scolopacidae	Calidris tenuirostris	24790	Great Knot	CR & IA	18/02/2015	18	2	2015	1783599   165	BIRDATA						Little Lagoon	0
Animalia	BIRD	Scolopacidae	Calidris tenuirostris	24790	Great Knot	CR & IA	20/02/2015		2	2015	1783611   165	BIRDATA						Big Lagoon	0
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	6/08/1977	6	8	1977	3401   153	BIRDATLAS1	Moderately Certain	Observational	Sighting	1	FRANÇOIS PERON NATIONAL PARK		18000
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	8/05/1979	8	5	1979	59665   153	BIRDATLAS1		Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	FRANCOIS PERON NATIONAL PARK	18000
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	12/05/1980	12	5	1980	89430   153	BIRDATLAS1		Observational		1	FRANCOIS PERON NATIONAL PARK	FRANCOIS PERON NATIONAL PARK	18000
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	26/06/1980		6	1980	89432   153	BIRDATLAS1	Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	FRANCOIS PERON NATIONAL PARK	18000
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	14/10/1998	14	10	1998	1981   153	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Fowlers Camp	5000
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	30/03/1999	30	3	1999	25583   153	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	Shark Bay, via Denham	5000
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	13/12/1999			1999	60148   153		Moderately Certain	Observational	Sighting	1	DENHAM	Denham	500
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	29/03/2002		3	2002	275788   153	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Nicholson Point	100
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	1/04/2002		4	2002	275809   153		Moderately Certain	Observational	Sighting	1	DENHAM	Mangrove beach	100
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	1/11/2002			2002	283680   153	+		Observational	Sighting	1	DENHAM	Denham	0
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	26/01/2004		1	2004		BIRDATLAS2		Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	Eagle Bluff	100
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	26/01/2004		1	2004	427836   153	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	Eagle Bluff lagoon	100
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	27/01/2004		1	2004	427822   153	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	Little Lagoon Inlet	100
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	12/05/2004			2004	438364 153			Observational	Sighting	- 1	FRANCOIS PERON NATIONAL PARK	Eagles Bluff	100
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	9/10/2004			2004		BIRDATLAS2		Observational	Sighting	1	SHARK BAY	Lagoon inlet	100
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	bar-tailed godwit	IA	11/10/2004		10	2004	435441   153		Moderately Certain	Observational	Sighting	1	DENHAM	Litle Lagoon	100
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	Bar-tailed Godwit	IA	16/10/2007		10	2007	1792556   153	BIRDATA						Little Lagoon	0
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932		IA	16/10/2007			2007	1792554   153	+						Big Lagoon	0
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932		IA	16/10/2007			2007	1783591   153			1				Little Lagoon	0
Animalia	BIRD	Scolopacidae	Limosa Iapponica	30932	Bar-tailed Godwit	IA	16/10/2007		10	2007	1468567   153							Eagle tidal lake	0
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	Bar-tailed Godwit	IA	16/10/2007	16	10	2007	1783609   153	BIRDATA		1				Big Lagoon	0
Animalia	BIRD	Scolopacidae	Limosa Iapponica	30932	Bar-tailed Godwit	IA	14/07/2011			2011	1218966   153			1				eagle bluff	0
Animalia	BIRD	Scolopacidae	Limosa Iapponica	30932	bar-tailed godwit	IA	14/07/2011		7	2011	5096597   153		Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	eagle bluff	100
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	Bar-tailed Godwit	IA	12/07/2013		7	2013	1783596   153	+					+	Little Lagoon	0
Animalia	BIRD	Scolopacidae	Limosa lapponica	30932	Bar-tailed Godwit	IA	28/09/2014		9	2014	1558530   153	BIRDATA			1			Little Lagoon, Denham	0
Animalia	BIRD	Scolopacidae	Limosa Iapponica	30932	Bar-tailed Godwit	IA	18/02/2015			2015	1783599   153			-			+	Little Lagoon	0
Animalia	BIRD	Scolopacidae	Limosa lapponica Limosa limosa	30932 25741	Bar-tailed Godwit black-tailed godwit	IA IA	20/02/2015			2015	1783611   153	BIRDATA BIRDATLAS2	Matanaka	Observational	0		DENHAM	Big Lagoon	0
Animalia	BIRD	Scolopacidae					1/11/2002	1	11	2002			Moderately Certain		Siahtina		DENHAM	Denham	



KINDDOM	CLASS	FAMILY	NAME OOL	OLIDODEOUE	NAME OF	NAME COM C	ONO COM	E DATE	D 41/6	MONTH	\#E4P	COLUDOD-12	COLUDOR	OFFICE	METHOD	TO COE	COLIN	T LOONITY	SITE	ACCURACY M
KINGDOM	BIRD	FAMILY Scolopacidae	NAME_SCI	SUBSPECIES	25741	NAME_COM C	ONS CODE	11/11/2008			YEAR 2008	SOURCE ID	SOURCE BIRDATLAS2	CERTAINTY Moderately Certain	METHOD Observational	TYPE	COUN	T LOCALITY DENHAM	SITE Little Lagoon	100
Animalia	BIRD	Scolopacidae	Limosa limosa Limosa limosa		25741	black-tailed godwit	IA IA	11/11/2008			2008		BIRDATLAS2		Observational	Sighting Sighting	1	DENHAM	LITTLE IAGOON	100
Animalia	BIRD	Scolopacidae	Limosa limosa		25741	black-tailed godwit	IA	13/11/2008			2008		BIRDATLAS2	Moderately Certain	Observational		1	DENHAM	Denham Lookout	100
Animalia	BIRD	Scolopacidae	Limosa limosa		25741	Black-tailed Godwit	IA	15/08/2014		8	2014	1318064   152	BIRDATA						Eagle Bluff SB	0
Animalia	BIRD	Scolopacidae	Limosa limosa		25741	Black-tailed Godwit	IA	18/02/2015	18	2	2015	1783599   152	BIRDATA						Little Lagoon	0
Animalia	BIRD	Scolopacidae	Numenius madagascariensis		24798	Eastern Curlew	CR	18/02/2015	18	2	2015	1783599   149							Little Lagoon	0
Animalia	BIRD	Scolopacidae	Numenius phaeopus		25742	whimbrel	IA	9/10/2004			2004		BIRDATLAS2	Moderately Certain	Observational	Sighting	1	SHARK BAY	Lagoon inlet	100
Animalia	BIRD	Scolopacidae	Tringa brevipes		24803	Grey-tailed Tattler	IA	8/05/1979		5	1979	59665   155	BIRDATLAS1							18000
Animalia	BIRD	Scolopacidae	Tringa brevipes		24803	Grey-tailed Tattler	IA	30/03/1999		3	1999	25583   155	BIRDATLAS2						Shark Bay, via Denham	5000
Animalia Animalia	BIRD	Scolopacidae Scolopacidae	Tringa brevipes Tringa brevipes		24803 24803	Grey-tailed Tattler Grey-tailed Tattler	IA IA	11/09/1999		9	1999 2002	32691   155 275809   155	BIRDATLAS2 BIRDATLAS2						Denham Managana hasah	100
Animalia	BIRD	Scolopacidae	Tringa brevipes		24803	Grey-tailed Tattler	IA	26/01/2004		1	2002	427835   155	BIRDATLAS2						Mangrove beach Eagle Bluff	100
Animalia	BIRD	Scolopacidae	Tringa brevipes		24803	Grey-tailed Tattler	IA	27/01/2004		1	2004	427822 155	BIRDATLAS2						Little Lagoon Inlet	100
Animalia	BIRD	Scolopacidae	Tringa brevipes		24803	Grey-tailed Tattler	IA	11/10/2004		10	2004		BIRDATLAS2						Litle Lagoon	100
Animalia	BIRD	Scolopacidae	Tringa brevipes		24803	Grey-tailed Tattler	IA	16/10/2007		10	2007	1783609   155	BIRDATA						Big Lagoon	0
Animalia	BIRD	Scolopacidae	Tringa brevipes		24803	Grey-tailed Tattler	IA	4/04/2008		4	2008	498551   155	BIRDATLAS2							100
Animalia	BIRD	Scolopacidae	Tringa brevipes		24803	Grey-tailed Tattler	IA	28/09/2014			2014	1558530   155	BIRDATA						Little Lagoon, Denham	0
Animalia	BIRD	Scolopacidae	Tringa brevipes		24803	Grey-tailed Tattler	IA	18/02/2015			2015	1783599   155							Little Lagoon	0
Animalia	BIRD	Scolopacidae	Tringa brevipes		24803	Grey-tailed Tattler	IA	20/02/2015		2	2015	1783611   155	BIRDATA						Big Lagoon	0
Animalia Animalia	BIRD	Scolopacidae Scolopacidae	Tringa glareola		24806 24806	wood sandpiper wood sandpiper	IA IA	24/01/2004 25/01/2004		1 1	2004 2004	415437   154	BIRDATLAS2 BIRDATLAS2	Moderately Certain  Moderately Certain	Observational Observational	Sighting	1	DENHAM DENHAM	Sewage ponds Denham Waterworks	100
Animalia	BIRD	Scolopacidae	Tringa glareola Tringa glareola		24806	wood sandpiper wood sandpiper	IA IA	3/04/2004			2004		BIRDATLAS2	,	Observational	Sighting Sighting	1	DENHAM	Dennam Waterworks  Denham Water Supply	100
Animalia	BIRD	Scolopacidae	Tringa glareola		24806	wood sandpiper wood sandpiper	IA	6/10/2004	6	10	2004		BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Water Corp.	100
Funnana	DIIID	Осолорионии	Tringa giarcoia		1-1000			0, 10, 2004	-	10	2004	402042   104	DITIDATE	woodcrately oction	ODUCI VALIDINAI	Oigning		DETTIME	Water Gorp.	100
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	common greenshank, greenshank	IA	8/05/1979	8	5	1979	59665   158	BIRDATLAS1	Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	FRANCOIS PERON NATIONAL PARK	18000
Animalia	BIRD	Scolopacidae	Towns to be to		24808	common greenshank, greenshank	IA	15/10/1998	15	10	1998	2137   158	BIRDATI AS2	Made and Control	Observational	On Land		SHARK BAY	D: I	500
Animalia	BIHD	Scolopacidae	Tringa nebularia		24808	common greensmank, greensmank	IA	15/10/1998	15	10	1998	2137   158	DINDATLAS2	Moderately Certain	Observational	Sighting		SHARK BAY	Big Lagoon	500
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	common greenshank, greenshank	IA	13/12/1999	13	12	1999	60148   158	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Denham	500
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	common greenshank, greenshank	IA	28/09/2003	28	9	2003	444425   158	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Little Lagoon	100
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	common greenshank, greenshank	IA	27/01/2004	27	1	2004	427822 158	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	FRANÇOIS PERON NATIONAL PARK	Little Lagoon Inlet	100
																			-	
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	common greenshank, greenshank	IA	9/10/2004	9	10	2004	432839   158	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	SHARK BAY	Lagoon inlet	100
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	common greenshank, greenshank	IA	11/10/2004	11	10	2004	435441 158	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Litle Lagoon	100
Politicalia	DIIID	Ocolopacidae	Tringa nebulana		24000	common greenanam, greenanam	IA.				2004	433441 130	BINDATEAGE	Woder ately Certain	Observational	Oigning		DENIM	Little Lagoon	100
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	common greenshank, greenshank	IA	12/10/2004	12	10	2004	435443   158	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	DENHAM	Lookout	100
Animalia	BIRD	Scolopacidae	Towns to be to		24808	Common Greenshank, greenshank	IA	16/10/2007	16	10	2007	1792554 158	BIRDATA						D: I	0
Animalia	BIHD	Scolopacidae	Tringa nebularia		24808	Common Greensnank, greensnank	IA	16/10/2007	16	10	2007	1/92554 158	BIRDATA						Big Lagoon	U
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	Common Greenshank, greenshank	IA	16/10/2007	16	10	2007	1783591   158	BIRDATA						Little Lagoon	0
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	Common Greenshank, greenshank	IA	16/10/2007	16	10	2007	1783608   158	BIRDATA						Big Lagoon	0
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	Common Greenshank, greenshank	IA	16/10/2007	16	10	2007	1468567   158	BIRDATA						Eagle tidal lake	0
		, i																		-
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	Common Greenshank, greenshank	IA	16/10/2007	16	10	2007	1468572   158	BIRDATA						Little Lagoon	0
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	Common Greenshank, greenshank	IA	16/10/2007	16	10	2007	1783593   158	BIRDATA						Little Lagoon	0
Ariimalia	BIND	Scolopacidae	Tringa nebulana		24000	Common Greenshank, greenshank	IM	16/10/2007	10	10	2007	1763393 136	BINDATA						Little Lagoon	U
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	Common Greenshank, greenshank	IA	16/10/2007	16	10	2007	1783609   158	BIRDATA						Big Lagoon	0
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	Common Greenshank, greenshank	IA	28/09/2014	28	9	2014	1558530   158	BIRDATA						Little Lagoon, Denham	0
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	Common Greenshank, greenshank	IA	17/11/2014	17	11	2014	1319492 158	BIRDATA						Denham	0
						·														
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	Common Greenshank, greenshank	IA	18/02/2015	18	2	2015	1783599   158	BIRDATA						Little Lagoon	0
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	Common Greenshank, greenshank	IA	20/02/2015	20	2	2015	1783611 158	BIRDATA						Rig Laggon	0
Ariinalia	DIND	Scolopacidae	rringa nebularia		24000	Common Greenshank, greenshank	IM	20/02/2015	20	- 2	2015	1703011 130	BINDATA						Big Lagoon	U
Animalia	BIRD	Scolopacidae	Tringa nebularia		24808	Common Greenshank, greenshank	IA	26/08/2015	26	8	2015	1326387   158	BIRDATA						Shark Bay: DenhamLittle Lagoon	0
A	BIBD	Caulanteid	Triang at a control		24809	marsh sandpiper, little greenshank	IA	26/01/2004	26	1	2004	427836 159	BIRDATI AS2	Madagat Cont.	Obassa	C:l.···		FRANÇOIS PERON NATIONAL PARK	Early District	100
Animalia	RIKD	Scolopacidae	Tringa stagnatilis		24809	marsn sandpiper, little greenshank	IA	26/01/2004	26	1	2004	42/836 159	DIHDATLAS2	Moderately Certain	Observational	Sighting	1	PHANCOIS PERON NATIONAL PARK	Eagle Bluff lagoon	100
Animalia	BIRD	Scolopacidae	Tringa stagnatilis		24809	marsh sandpiper, little greenshank	IA	27/01/2004	27	1	2004	427822   159	BIRDATLAS2	Moderately Certain	Observational	Sighting	1	FRANCOIS PERON NATIONAL PARK	Little Lagoon Inlet	100
Animalia	BIRD	Scolopacidae	Xenus cinereus		41351	Terek Sandpiper	IA	13/12/1999	13	12	1999	60148   160	BIRDATLAS2						Denham	500
Animalia	BIRD	Scolopacidae	Xenus cinereus		41351	Terek Sandpiper	IA	16/10/2007			2007	1783609   160	BIRDATA						Big Lagoon	0
Animalia	BIRD		Amytornis textilis textilis		0	western grasswren	P4	1/01/1917			1917	12773	TFAUNA	Certain	Historical (written)			Francois Peron National Park		50000
Animalia	BIRD		Amytornis textilis textilis		0	western grasswren	P4	1/01/1921	1	1	1921	12774	TFAUNA	Certain	Historical (written)		0	François Peron National Park		50000
Animalia Animalia	BIRD		Amytornis textilis textilis		0	western grasswren western grasswren	P4 P4	1/01/1958	1	1	1958 1972	12775 12776	TFAUNA TFAUNA	Certain Certain	Historical (written)		0	François Peron National Park		50000
Animalia Animalia	BIRD		Amytornis textilis textilis Amytornis textilis textilis		0	western grasswren western grasswren	P4 P4	1/01/1972			1972 1972	12776	TFAUNA	Certain Certain		Day sighting ught or trap	1	Francois Peron National Park Francois Peron National Park		50000 50000
Amilliana	טותט		Amytornia textilis textilis		J	Dirk Hartog Island rufous	1.49			0	1912	12/30		Certain	Gurvey	agiir di tidb		i rancolo i eroll National Park		30000
Animalia	BIRD		Calamanthus campestris hartogi		0	fieldwren	VU	1/01/1917	1	1	1917	12769	TFAUNA	Certain	Historical (written)	Day sighting	0	Francois Peron National Park		50000
A .: 1:	DIES		Out-out-out-out-out-out-out-out-out-out-o		-	Dirk Hartog Island rufous		4 (0: (::::::	I , T	1	4.00		TEA:	0	Here was the second	D	_	E		50555
Animalia	BIRD		Calamanthus campestris hartogi		0	fieldwren Dirk Hartog Island rufous	VU	1/01/1921	1	1	1921	12770	TFAUNA	Certain	Historical (written)	Day sighting	0	Francois Peron National Park		50000
Animalia	BIRD		Calamanthus campestris hartogi		0	fieldwren	VU	1/01/1944	1	1	1944	12771	TFAUNA	Certain	Historical (written)	Day sighting	0	Francois Peron National Park		50000
						Dirk Hartog Island rufous										, , ,				
Animalia	BIRD		Calamanthus campestris hartogi		0	fieldwren	VU	1/01/1959	1	1	1959	12740	TFAUNA	Certain	Historical (written)	Day sighting	0	Francois Peron National Park		50000
Animalia	BIRD		Calamanthus campestris hartogi		0	Dirk Hartog Island rufous fieldwren	VU	1/01/1972	1	1	1972	12772	TFAUNA	Certain	Survey	Day sighting	0	Francois Peron National Park		50000
Animalia	BIRD		Leipoa ocellata		0	malleefowl	VU	1/01/1917	1	1	1972	12772	TFAUNA	Certain	Historical (written)		0	Francois Peron National Park Francois Peron National Park		50000
Animalia	BIRD		Leipoa ocellata		0	malleefowl	VU	1/01/1917		1	1917	91544	TFAUNA	Moderately certain	Historical (written)		4	FRANCOIS PERON NATIONAL PARK		10000
Animalia	BIRD		Leipoa ocellata		0	malleefowl	VU	1/01/1917	1	1	1917	91546	TFAUNA	Moderately certain			1	FRANCOIS PERON NATIONAL PARK		50000
Animalia	BIRD		Leipoa ocellata		0	malleefowl	VU	1/01/1917	1	1	1917	91549	TFAUNA	Moderately certain	pportunistic sightin	Sighting	1	FRANCOIS PERON NATIONAL PARK		50000
Animalia	BIRD		Leipoa ocellata		0	malleefowl	VU	1/01/1921	1	1	1921	91545	TFAUNA	Moderately certain	pportunistic sightin	Sighting	1	FRANCOIS PERON NATIONAL PARK		50000
Animalia	BIRD		Leipoa ocellata		0	malleefowl	VU	1/01/1921	1	1	1921	91547	TFAUNA	Moderately certain				FRANCOIS PERON NATIONAL PARK		50000



KINGDOM	CLASS	FAMILY	NAME SCI	SUBSPECIES	NAME ID	NAME COM	CONS CODE	DATE	DAY M	4ONTH	YEAR	SOURCE ID	SOURCE	CERTAINTY	METHOD	TVDE	COUN	T LOCALITY	SITE	ACCURACY M
Animalia	BIRD	I AWIET	Leipoa ocellata	OODO! LOILO	0	malleefowl	VU	1/01/1921	1	1	1921	91550	TFAUNA	Moderately certain	Opportunistic sighti	-		FRANÇOIS PERON NATIONAL PARK	OHE	50000
Animalia	BIRD		Leipoa ocellata		0	malleefowl	VU	1/01/1921	4	1	1943	12745	TFAUNA	Certain	Historical (written			Francois Peron National Park		50000
	BIRD				0	malleefowl	VU		-	1	1943	91548	TFAUNA				ig U	FRANCOIS PERON NATIONAL PARK		
Animalia	BIRD		Leipoa ocellata		0	malleerowi		1/01/1943	1	1				Moderately certain	Opportunistic sighti		1			50000
Animalia			Leipoa ocellata		0		VU	1/01/1943	1	-	1943	91551	TFAUNA	Moderately certain	Opportunistic sighti			FRANCOIS PERON NATIONAL PARK		1000
Animalia	BIRD		Leipoa ocellata			malleefowl	VU	15/10/1997		10	1997	3611	TFAUNA	Certain	Translocation	Released		Francois Peron National Park		10000
Animalia	BIRD		Leipoa ocellata		0	malleefowl	VU	15/10/1998	15	10	1998	3612	TFAUNA	Certain	Translocation	Released	31	Francois Peron National Park		10000
Animalia	BIRD		Leipoa ocellata		0	malleefowl	VU	4/05/2012	4	5	2012	96767	TFAUNA	Certain	Opportunistic sighti	-	1	Francoi Peron NP		1000
Animalia	BIRD		Numenius madagascariensis		0	eastern curlew	CR	1/01/1917	1	1	1917	12757	TFAUNA	Certain	Historical (written			Francois Peron National Park		50000
Animalia	BIRD		Numenius madagascariensis		0	eastern curlew	CR	1/01/1917	1	1	1917	12757	TFAUNA	Certain	Historical (written	n) Day sighti	ng 0	Francois Peron National Park		50000
Animalia	BIRD		Numenius madagascariensis		0	eastern curlew	CR	1/01/1917	1	1	1917	12757	TFAUNA	Certain	Historical (written			Francois Peron National Park		50000
Animalia	BIRD		Numenius madagascariensis		0	eastern curlew	CR	1/01/1917	1	1	1917	12757	TFAUNA	Certain	Historical (written	n) Day sighti	ng 0	Francois Peron National Park		50000
Animalia	BIRD		Numenius madagascariensis		0	eastern curlew	CR	1/01/1921	1	1	1921	12758	TFAUNA	Certain	Historical (written	n) Day sighti	ng 0	Francois Peron National Park		50000
Animalia	BIRD		Numenius madagascariensis		0	eastern curlew	CR	1/01/1921	1	1	1921	12758	TFAUNA	Certain	Historical (written	n) Day sighti	ng 0	Francois Peron National Park		50000
Animalia	BIRD		Numenius madagascariensis		0	eastern curlew	CR	1/01/1921	1	1	1921	12758	TFAUNA	Certain	Historical (written	n) Day sighti	ng O	Francois Peron National Park		50000
Animalia	BIRD		Numenius madagascariensis		0	eastern curlew	CR	1/01/1921	1	1	1921	12758	TFAUNA	Certain	Historical (written	n) Day sighti	ng O	Francois Peron National Park		50000
Animalia	BIRD		Numenius madagascariensis		0	eastern curlew	CR	1/01/1959	1	1	1959	12739	TFAUNA	Certain	Historical (written	n) Day sighti	ng O	Francois Peron National Park		50000
Animalia	BIRD		Numenius madagascariensis		0	eastern curlew	CR	1/01/1959	1	1	1959	12739	TFAUNA	Certain	Historical (written	) Day sighti	nn ()	François Peron National Park		50000
Animalia	BIRD		Numenius madagascariensis		0	eastern curlew	CR	1/01/1959	1	1	1959	12739	TFAUNA	Certain	Historical (written			François Peron National Park		50000
Animalia	BIRD		Numenius madagascariensis		0	eastern curlew	CR	1/01/1959	1	1	1959	12739	TFAUNA	Certain	Historical (written			François Peron National Park		50000
Animalia	MAMMAL	Dasvuridae	Dasyurus geoffroii		24092	chuditch, western auoll	VU	5/05/2011	5	5	2011	535047	FAUNASURVE'	Certain	Survey	Unknow	-	FRANÇOIS PERON NATIONAL PARK	SharkBay, Peron Peninsula	25000
Animalia	MAMMAL	Dugongidae	Dugong dugon		24084	dugong	OS	8/08/1966	8	8	1966	MAMM-M7075	VAM MAMMAL	WAM Vouchered	Collection	Specime		SHARK BAY	SHARK BAY	10000
Animalia	MAMMAI	Peramelidae	Macrotis lagotis		24168	bilby, dalgyte, ninu	VU	16/04/2010	16	4	2010	534968	FAUNASURVE	Certain	Survey	Unknow	. 1	FRANÇOIS PERON NATIONAL PARK	SharkBay, Peron Peninsula	25000
Animalia	MAMMAI	i eraniendae	Bettongia penicillata ogilbyi		0	wovlie, brush-tailed bettong	CB	25/09/1997		9	1997	12272	TFAUNA	Certain	anslocation monito		- 1	François Peron National Park	Oliai Kbay, Feloli Felilisula	1000
Animalia	MAMMAI		Bettongia penicillata ogilbyi		0	woylie, brush-tailed bettong	CR	11/10/1997	11	10	1997	12278	TFAUNA	Certain	anslocation monito		1	Francois Peron National Park		1000
Animalia	MAMMAL		Bettongia penicillata ogilbyi		0	woylie, brush-tailed bettong	CR	4/11/1997	4	11	1997	12282	TFAUNA	Certain	anslocation monito		4	Francois Peron National Park		1000
Animalia	MAMMAI		9 1 9 3		0	woyle, brush-tailed bettong wovlie, brush-tailed bettong	CR	5/11/1997	4	11	1997	12282	TFAUNA	Certain	ansiocation monito		-	François Peron National Park		1000
Animalia	MAMMAI		Bettongia penicillata ogilbyi		0	woyle, brush-tailed bettong	CR	5/11/1997	5	11	1997	12281	TFAUNA	Certain	ansiocation monito		1	Francois Peron National Park Francois Peron National Park		1000
			Bettongia penicillata ogilbyi						5				1				-			
Animalia	MAMMAL		Bettongia penicillata ogilbyi		0	woylie, brush-tailed bettong	CR	6/11/1997	6	11	1997	12279	TFAUNA	Certain	anslocation monito	_	1	Francois Peron National Park		1000
Animalia	MAMMAL		Bettongia penicillata ogilbyi		0	woylie, brush-tailed bettong	CR	8/11/1997	8	11	1997	12280	TFAUNA	Certain	anslocation monito		1	Francois Peron National Park		1000
Animalia	MAMMAL		Bettongia penicillata ogilbyi		0	woylie, brush-tailed bettong	CR	11/11/1997		11	1997	12277	TFAUNA	Certain	anslocation monito		1	Francois Peron National Park		1000
Animalia	MAMMAL		Bettongia penicillata ogilbyi		0	woylie, brush-tailed bettong	CR	16/11/1997	16	11	1997	12284	TFAUNA	Certain	anslocation monito	ori Dead	1	Francois Peron National Park		1000
Animalia	REPTILE	Boidae	Aspidites ramsayi (southwest subpop.)		25236	woma (southwest subpop.)	P1	13/03/1996		3	1996		WAM REPTILE:	WAM Vouchered	Collection	Specime	1	DENHAM	DENHAM	10000
Animalia	REPTILE	Boidae	Aspidites ramsayi (southwest subpop.)		25236	woma (southwest subpop.)	P1	18/05/1998		5	1998		WAM REPTILE:	WAM Vouchered	Collection	Specime	1 1	FRANCOIS PERON NATIONAL PARK	DENHAM	10000
Animalia	REPTILE	Boidae	Aspidites ramsayi (southwest subpop.)		25236	woma (southwest subpop.)	P1	24/09/2001	24	9	2001		WAM REPTILE:	WAM Vouchered	Collection	Specime	1 1	FRANCOIS PERON NATIONAL PARK	MONKEY MIA	200000
Animalia	REPTILE	Cheloniidae	Caretta caretta		25335	loggerhead turtle	EN		0	0	0		WAM REPTILE:	WAM Vouchered	Collection	Specime	1 1	DENHAM	Shark Bay	200000
Animalia	REPTILE	Cheloniidae	Caretta caretta		25335	loggerhead turtle	EN		0	0	0	REPT:R324	WAM REPTILE:	WAM Vouchered	Collection	Specime	1	DENHAM	Shark Bay	200000
Animalia	REPTILE	Cheloniidae	Caretta caretta		25335	Loggerhead Turtle	EN		0	0	0	conomy.org.au:f	WAM REPTILES						Shark Bay	200000
Animalia	REPTILE	Cheloniidae	Caretta caretta		25335	Loggerhead Turtle	EN		0	0	0	conomy.org.au:f	WAM REPTILES						Shark Bay	200000
Animalia	REPTILE	Cheloniidae	Chelonia mydas		25336	green turtle	VU	14/02/2014	14	2	2014	775915	FAUNASURVE'	Certain	Survey	Unknow	1	SHARK BAY	SharkBay, EasternGulf	100
Animalia	REPTILE	Pygopodidae	Pletholax gracilis edelensis	edelensis	25006	keeled legless lizard (Shark Bay)	P3	14/10/1994	14	10	1994	REPT:R120973	WAM REPTILE:	WAM Vouchered	Collection	Specime	1 1	FRANCOIS PERON NATIONAL PARK	PERON	200000
	DEDTU E		8			K													050011	
Animalia	REPTILE	Pygopodidae	Pletholax gracilis edelensis	edelensis	25006	Keeled Legless Lizard (Shark Bay)	P3	14/10/1994		10	1994		WAM REPTILES			_			PERON	200000
Animalia	REPTILE	Scincidae	Egernia stokesii badia	badia	25107	western spiny-tailed skink	VU	22/04/1900		4	1900		WAM REPTILE:	WAM Vouchered	Collection	Specime		DENHAM	DENHAM	50000
Animalia	REPTILE	Scincidae	Egernia stokesii badia	badia	25107	western spiny-tailed skink	VU	11/08/2003	11	8	2003	REPT:R152995	WAM REPTILE:	WAM Vouchered	Collection	Specime	1 1	FRANCOIS PERON NATIONAL PARK	MONKEY MIA	200000
Animalia	REPTILE	Caiaaidaa	Eis atalianii badia	hadia	05107	Western Spiny-tailed Skink, Gidgee Skink	VU	11 /00 /2002	11	8	2002		WAM REPTILES						MONKEY MIA	200000
		Scincidae	Egernia stokesii badia	DeGla	25107 0	woma (southwest subpop.)	P1	11/08/2003	4	0	2003 1981			Certain	0	da		Dona Davisa Is	IVIOINEY MIA	
Animalia	REPTILE		Aspidites ramsayi (southwest subpop.)					1/01/1981	1	1		12054	TFAUNA		Survey	ught or tra	_	Peron Peninsula		50000
Animalia	REPTILE		Aspidites ramsayi (southwest subpop.)		0	woma (southwest subpop.)	P1	1/03/1993	1	3	1993	12055	TFAUNA	Certain	Targeted survey			Denham		1000
Animalia	REPTILE		Aspidites ramsayi (southwest subpop.)		0	woma (southwest subpop.)	P1	1/01/1996	1	1	1996	12059	TFAUNA	Certain	Targeted survey			Denham		1000
Animalia	REPTILE		Aspidites ramsayi (southwest subpop.)		0	woma (southwest subpop.)	P1	1/01/1998	1	1	1998	12060	TFAUNA	Certain	Survey	ught or tra		Denham		1000
Animalia	REPTILE		Aspidites ramsayi (southwest subpop.)		0	woma (southwest subpop.)	P1	1/12/1998	1	12	1998	12058	TFAUNA	Certain	Targeted survey			Peron Peninsula		10000
Animalia	REPTILE		Aspidites ramsayi (southwest subpop.)		0	woma (southwest subpop.)	P1	5/10/2000	5	10	2000	3184	TFAUNA	Certain	Opportunistic sighti		ng 1	Shark Bay		1000
Animalia	REPTILE		Aspidites ramsayi (southwest subpop.)		0	woma (southwest subpop.)	P1	9/04/2012	9	4	2012	19589	TFAUNA	Certain	Opportunistic sighti	in Sighting	1	DENHAM		1000
Animalia	REPTILE		Egernia stokesii badia		0	western spiny-tailed skink	VU	1/08/1992	1	8	1992	4952	TFAUNA	Certain	Survey	ught or tra	p 1	Francois Peron National Park		50000
Animalia	REPTILE		Egernia stokesii badia		0	western spiny-tailed skink	VU	11/08/2003	11	8	2003	8694	TFAUNA	Certain	Survey	ught or tra	р 1	Francois Peron National Park		1000
			•			*						•			*					



# **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 <u>Environment Assessments</u> and the EPBC Act including significance guidelines, forms and application process details.

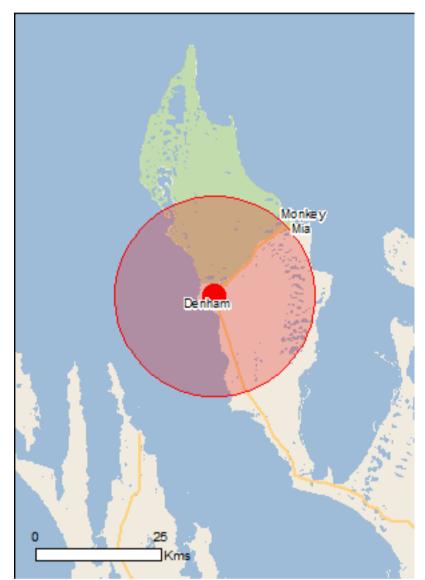
Report created: 17/07/19 17:28:32

Summary Details

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

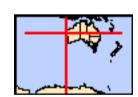
Caveat

<u>Acknowledgements</u>



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 20.0Km



## **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 <u>Administrative Guidelines on Significance</u>.

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	33
Listed Migratory Species:	51

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	79
Whales and Other Cetaceans:	10
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

#### **Extra Information**

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

State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	9
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

# Details

## Matters of National Environmental Significance

World Heritage Properties		[ Resource Information ]
Name	State	Status
Shark Bay, Western Australia	WA	Declared property
National Heritage Properties		[ Resource Information ]
Name	State	Status
Natural		
Shark Bay, Western Australia	WA	Listed place

Listed Threatened Species		[ Resource Information ]
Name	Status	Type of Presence
Birds		
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris		
Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii		
Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Diomedea amsterdamensis		
Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea exulans		
Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata		
Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica baueri		
Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica menzbieri		
Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus		
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli		
Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pterodroma mollis Soft plumaged Petrol [1026]	Vulnorable	Chasias ar angeige habitat
Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis  Avetralian Faire Tara [22050]	Villa a rala la	Drooding troous to coose
Australian Fairy Tern [82950]	Vulnerable	Breeding known to occur within area
Thalassarche carteri		
Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta cauta Shy Albetroes Teamonian Shy Albetroes [92245]	Vulnerable	Chasias ar anasias habitat
Shy Albatross, Tasmanian Shy Albatross [82345]	vuinerable	Species or species habitat may occur within area
Thalassarche cauta steadi	Vivila a nale la	
White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campball Albatross, Campball Black browned Albatross	Vulnorabla	Species or species habitat
Campbell Albatross, Campbell Black-browed Albatross [64459]	vumerable	Species or species habitat may occur within area
Thalassarche melanophris	V. do o no le lo	On a sing our own a sing habitat
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Mammals		
Bettongia penicillata ogilbyi		
Woylie [66844]	Endangered	Species or species habitat known to occur within area
Dasyurus geoffroii		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area
		Known to cood! Within area
Eubalaena australis		
Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
		intoly to occur within area
Macrotis lagotis	Vivila a rala la	On a sing on an arise helitat
Greater Bilby [282]	Vulnerable	Species or species habitat known to occur within area
Megaptera novaeangliae	Vulnerable	Congregation or
Humpback Whale [38]	vuinerable	Congregation or aggregation known to occur
Dionto		within area
Plants <u>Eucalyptus beardiana</u>		
Beard's Mallee [18933]	Vulnerable	Species or species habitat
		may occur within area
Reptiles		
<u>Caretta caretta</u>		
Loggerhead Turtle [1763]	Endangered	Breeding known to occur
<u>Chelonia mydas</u>		within area
Green Turtle [1765]	Vulnerable	Breeding known to occur
Dormocholya acricaca		within area
<u>Dermochelys coriacea</u> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat
Loan or back Tarno, Loan ory Turno, Lun [1700]	Lindarigorod	known to occur within area
Egorpio etalessii hadia		
Egernia stokesii badia Western Spiny-tailed Skink, Baudin Island Spiny-tailed	Endangered	Species or species habitat
Skink [64483]		known to occur within area

Name	Status	Type of Presence
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
Sharks		
Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		[ Resource Information ]
* Species is listed under a different scientific name on	the FPBC Act - Threatened	
Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus		
Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Diomedea amsterdamensis		
Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Hydroprogne caspia Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Onychoprion anaethetus Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area
Sterna dougallii Roseate Tern [817]		Breeding likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Species or species habitat likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]  Chelonia mydas	Endangered	Breeding known to occur within area
Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea  Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat known to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		

Name	Threatened	Type of Presence
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
<u>Limosa lapponica</u> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<u>Limosa limosa</u> Black-tailed Godwit [845]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species

	habitat known to occur within area
Xenus cinereus	
Terek Sandpiper [59300]	Species or species habitat
	known to occur within area

Threatened

Type of Presence

### Other Matters Protected by the EPBC Act

Name

Other Matters Protected by the EPBC Act		
Listed Marine Species		[ Resource Information ]
* Species is listed under a different scientific name on t	he EPBC Act - Threatened	Species list.
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat known to occur within area
<u>Calidris ruficollis</u>		
Red-necked Stint [860]		Species or species habitat known to occur within area
<u>Calidris tenuirostris</u>		
Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Catharacta skua		
Great Skua [59472]		Species or species habitat may occur within area
Charadrius leschenaultii		
Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius ruficapillus		
Red-capped Plover [881]		Species or species habitat known to occur within area
Chrysococcyx osculans		
Black-eared Cuckoo [705]		Species or species habitat known to occur within area
Diomedea amsterdamensis		
Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
<u>Diomedea exulans</u>		
Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Fregata ariel		
Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Heteroscelus brevipes		
Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area
<u>Larus pacificus</u> Pacific Gull [811]		Foraging, feeding or related
Limosa Japanica		behaviour known to occur within area
<u>Limosa lapponica</u> Bar-tailed Godwit [844]		Species or species habitat
		known to occur within area
Limosa limosa  Plack tailed Codwit [945]		Charina ar angaine habitat
Black-tailed Godwit [845]		Species or species habitat known to occur within area
Macronectes giganteus	е	0
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli	\	
Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Sterna anaethetus Bridled Tern [814]		Foraging, feeding or related behaviour likely to occur within area
Sterna bengalensis Lesser Crested Tern [815]		Breeding known to occur within area
Sterna caspia Caspian Tern [59467]		Foraging, feeding or related behaviour known to occur within area
Sterna dougallii Roseate Tern [817]		Breeding likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Tringa nebularia		_
Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Xenus cinereus		
Terek Sandpiper [59300]		Species or species habitat
		known to occur within area
Fish		
Campichthys galei		
Gale's Pipefish [66191]		Species or species habitat may occur within area
Choeroichthys suillus		
Pig-snouted Pipefish [66198]		Species or species habitat
		may occur within area
Festucalex scalaris		Charles or angeles habitat
Ladder Pipefish [66216]		Species or species habitat may occur within area
Filicompus tieris		•
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat
· · · · · · · · · · · · · · · · · · ·		may occur within area
Halicampus brocki		
Brock's Pipefish [66219]		Species or species habitat
		may occur within area
Haliichthys taeniophorus		
Ribboned Pipehorse, Ribboned Seadragon [66226]		Species or species habitat
		may occur within area
Hippocampus angustus		On a single service of the state of
Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
		, <del></del>
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat
		may occur within area
Hippocampus planifrons		
Flat-face Seahorse [66238]		Species or species habitat
		may occur within area
Hippocampus trimaculatus		
Three-spot Seahorse, Low-crowned Seahorse, Flat-		Species or species habitat
faced Seahorse [66720]		may occur within area
<u>Lissocampus fatiloquus</u> Prophot's Pinofish [66250]		Species or appoint habitat
Prophet's Pipefish [66250]		Species or species habitat may occur within area
Nannocampus subossous		-
Nannocampus subosseus  Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat
, , , , , , , , , , , , , , , , , , ,		may occur within area
Solegnathus lettiensis		
Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat
		may occur within area
Solenostomus cyanopterus		_
Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
		may occur within alea
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish		Species or species babitat
Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Syngnathoides biaculeatus  Double-end Pipehorse, Double-ended Pipehorse,		Species or species habitat
Alligator Pipefish [66279]		may occur within area

Name	Threatened	Type of Presence
Trachyrhamphus bicoarctatus  Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Mammals		
Dugong dugon  Dugong [28]		Species or species habitat known to occur within area
Reptiles		
Aipysurus laevis		
Olive Seasnake [1120]		Species or species habitat may occur within area
Aipysurus pooleorum Shark Bay Seasnake [66061]		Species or species habitat may occur within area
<u>Caretta caretta</u>		
Loggerhead Turtle [1763]  Chelonia mydas	Endangered	Breeding known to occur within area
Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea  Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Disteira major		
Olive-headed Seasnake [1124]		Species or species habitat may occur within area
Emydocephalus annulatus Turtle-headed Seasnake [1125]		Species or species habitat may occur within area
Ephalophis greyi		
North-western Mangrove Seasnake [1127]		Species or species habitat may occur within area
<u>Hydrophis elegans</u>		
Elegant Seasnake [1104]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area
Whales and other Cetaceans		[ Resource Information ]
Name	Status	Type of Presence
Mammals		<b>7</b> 1
Balaenoptera acutorostrata		
Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area

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

#### **Extra Information**

Oryctolagus cuniculus

Rabbit, European Rabbit [128]

State and Territory Reserves	[ Resource Information ]
Name	State
Francois Peron	WA
Monkey Mia Reserve	WA

Invasive Species

[ Resource Information ]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The

following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Landoupe Hount Hojoot, National Land and	vator recodecto radit, 2001	•
Name	Status	Type of Presence
Birds		
Streptopelia senegalensis		
Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris		
Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus		
Goat [2]		Species or species habitat likely to occur within area
Felis catus		
Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus		
House Mouse [120]		Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Name	Status	Type of Presence
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
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
Nationally Important Wetlands Name		[ Resource Information ] State
Shark Bay East		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 gualifications 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

-25.91088 113.54934

## 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.



## **NatureMap Species Report**

#### Created By Colleen McDonald on 17/07/2019

Kingdom Plantae

**Current Names Only** Yes

Core Datasets Only Yes

Method 'By Circle'

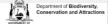
Centre 113° 32' 58" E,25° 54' 39" S

Buffer 20km

Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon Priority 1 Priority 2 Priority 3 Priority 4	434 2 7 9 1	1376 3 23 38 1
TOTAL	453	1441

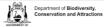
	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
Priority 1					
1.	18132	Dicrastylis sp. Denham (M. Lewis 42/92)		P1	Υ
2.	19192	Grevillea sp. Shark Bay (N.H. Speck 24/09/1953)		P1	Υ
Priority 2					
3.	14112	Abutilon sp. Hamelin (A.M. Ashby 2196)		P2	
4.	14114	Abutilon sp. Quobba (H. Demarz 3858)		P2	
5.	12616	Chthonocephalus muellerianus		P2	
6.	7934	Chthonocephalus tomentellus		P2	
7.	5945	Melaleuca oldfieldii		P2	
8.	12639	Olearia occidentissima		P2	
9.	12730	Sondottia glabrata		P2	
Priority 3					
10.	3309	Acacia drepanophylla		P3	
11.	1207	Acanthocarpus parviflorus		P3	
12.	6948	Anthocercis intricata		P3	
13.	30232	Bossiaea calcicola		P3	
14.	2083	Grevillea rogersoniana (Rogersons' Grevillea)		P3	
15.	3020	Lepidium biplicatum		P3	
16.	17208	Physopsis chrysophylla		P3	
17.	14241	Stenanthemum divaricatum		P3	
18.	694	Triodia plurinervata		P3	
Priority 4					
19.	13544	Eucalyptus zopherophloia (Blackbutt Mallee)		P4	
Non-conse	rvation ta	axon			
20.	4889	Abutilon cryptopetalum			
21.		Abutilon geranioides			
22.	43020	Abutilon oxycarpum subsp. Prostrate (A.A. Mitchell PRP 1266)			
23.	3208	Acacia amblyophylla			
24.	13072	Acacia chartacea			
25.	13500	Acacia coriacea subsp. coriacea			
26.	3323	Acacia ericifolia			
27.	3344	Acacia galeata			
28.	3355	Acacia grasbyi (Miniritchie)			
29.	11448	Acacia leptospermoides subsp. leptospermoides			
30.	3419	Acacia ligulata (Umbrella Bush, Watarka)			
31.	3510	Acacia ramulosa (Horse Mulga)			
32.	19499	Acacia ramulosa var. ramulosa			
33.	3525	Acacia rostellifera (Summer-scented Wattle)			
34.	3534	Acacia sclerosperma (Limestone Wattle)			
35.	13078	Acacia sclerosperma subsp. sclerosperma	, Seine .		







	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
36.	3549	Acacia spathulifolia			
37.	13070	Acacia synchronicia			
38.	3577	Acacia tetragonophylla (Kurara, Wakalpuka)			
39.	3595	Acacia victoriae (Bramble Wattle, Ngatunpa)			
40.	3606	Acacia xiphophylla			
41.		Acanthocarpus preissii			
42.		Acanthocarpus robustus			
43.		Acanthocarpus verticillatus			
44.		Acanthophora spicifera			
45.		Acetabularia caliculus			
46.		Actinolole condensation			
47. 48.		Actinobole condensatum Actinobole uliginosum (Flannel Cudweed)			
49.		Adriana tomentosa var. tomentosa			
50.		Aerva javanica (Kapok Bush)	Υ		
51.		Agave americana (Century Plant)	Y		
52.		Aglaothamnion cordatum			
53.		Aizoon pubescens	Υ		
54.		Alectryon oleifolius	•		
55.		Alectryon oleifolius subsp. oleifolius			
56.		Alyogyne cuneiformis (Coastal Hibiscus)			
57.		Alyogyne pinoniana (Sand Hibiscus)			
58.		Alyogyne pinoniana var. pinoniana			
59.		Amaranthus clementii			
60.	2369	Amyema benthamii			
61.	13266	Amyema miraculosa subsp. miraculosa			
62.	2383	Amyema preissii (Wireleaf Mistletoe)			
63.	40914	Androcalva gaudichaudii			
64.	7822	Angianthus acrohyalinus (Hook-leaf Angianthus)			
65.	7827	Angianthus cunninghamii (Coast Angianthus)			
66.	7832	Angianthus milnei (Cone-spike Angianthus)			
67.	26469	Anotrichium tenue			
68.	2332	Anthobolus foveolatus			
69.	6949	Anthocercis littorea (Yellow Tailflower)			
70.		Anthocercis sp. Shark Bay (T.E.H. Aplin 3335)			
71.		Argemone ochroleuca subsp. ochroleuca	Y		
72.		Aristida contorta (Bunched Kerosene Grass)			
73.	210	Aristida holathera			
74.	20400	Aristida sp.			
75. 76.		Asparagopsis taxiformis  Asparagopsis taxiformis  Asparagopsis taxiformis	V		
76. 77.		Asphodelus fistulosus (Onion Weed) Atriplex amnicola (Swamp Saltbush)	Υ		
78.		Atriplex bunburyana (Silver Saltbush)			
79.		Atriplex cinerea (Grey Saltbush)			
80.		Atriplex holocarpa (Pop Saltbush)			
81.		Atriplex paludosa (Marsh Saltbush)			
82.		Atriplex paludosa subsp. moquiniana			
83.		Atriplex semilunaris (Annual Saltbush)			
84.		Atriplex vesicaria (Bladder Saltbush)			
85.		Austrostipa crinita			
86.	17237	Austrostipa elegantissima			
87.	17246	Austrostipa nitida			
88.	17251	Austrostipa scabra			
89.		Austrostipa sp.			
90.	6828	Avicennia marina (White Mangrove)			
91.	14555	Avicennia marina subsp. marina			
92.		Banksia ashbyi (Ashby's Banksia)			
93.		Beaufortia sprengelioides (Shark Bay Beaufortia)			
94.		Beyeria cinerea			
95.		Beyeria cinerea subsp. borealis			
96.		Bossiaea walkeri			
97.		Bostrychia tenella subsp. tenella  Prochupiton gragorii (Deport Kurraiana, Nicelta)			
98.		Brachychiton gregorii (Desert Kurrajong, Ngalta)			
99.		Brachyscome iberidifolia	V		
100. 101.		Brassica tournefortii (Mediterranean Turnip)  Bromus arenarius (Sand Brome)	Y		
101.		Bromus arenarius (Sand Brome) Bromus diandrus (Great Brome)	Υ		
102.		Bulbostylis barbata	1		
104.		Bursaria occidentalis			
105.		Calandrinia liniflora (Parakeelya)			
			Departmer	nt of Biodiversity,	WESTERN







	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
106.	2860	Calandrinia polyandra (Parakeelya)			
107.	31132	Calandrinia sp. Truncate capsules (A. Markey & S. Dillon 3474)			
108.	30396	Calandrinia translucens			
109.	7891	Calocephalus francisii (Fine-leaf Beauty-heads)			
110.		Caloglossa monosticha			Υ
111.		Calothamnus formosus			
112.		Calothamnus glaber			
113.		Calothamnus oldfieldii			
114.		Calotis multicaulis (Many-stemmed Burr-daisy)			
115.		Calytrix strigosa Carpobrotus rossii (Karkalla)			
116. 117.		Cassytha aurea			
117.		Cassytha aurea var. aurea			
119.		Cassytha aurea var. hirta			
120.		Cassytha nodiflora			
121.		Caulerpa cupressoides			
122.		Caulerpa lentillifera			
123.	258	Cenchrus ciliaris (Buffel Grass)	Υ		
124.	259	Cenchrus echinatus (Burrgrass)	Υ		
125.	7916	Centaurea melitensis (Maltese Cockspur, Malta Thistle)	Υ		
126.	7922	Cephalipterum drummondii (Pompom Head)			
127.		Ceramium isogonum			
128.		Chenopodium gaudichaudianum (Cottony Saltbush)			
129.		Chenopodium murale (Nettle-leaf Goosefoot)	Y		
130.		Chondria succulenta			
131.		Charirana raamaaya			
132. 133.		Chrizema racemosum Chthonocephalus pseudevax (Woolly Groundheads)			
134.		Codonocarpus cotinifolius (Native Poplar, Kundurangu)			
135.		Commicarpus australis (Perennial Tar Vine)			
136.		Conostylis candicans subsp. flavifolia			
137.	6612	Convolvulus clementii			
138.	13560	Corchorus crozophorifolius			
139.	3137	Crassula colorata (Dense Stonecrop)			
140.	11563	Crassula colorata var. colorata			
141.		Cynanchum viminale subsp. australe			
142.		Cyperus rigidellus			
143. 144.		Dampiera incana var. incana Daucus glochidiatus (Australian Carrot)			
145.		Daviesia benthamii			
146.		Dianella revoluta (Blueberry Lily)			
147.		Dianella revoluta var. divaricata			
148.	18550	Dicrastylis maritima			
149.	2498	Didymanthus roei			
150.	4456	Diplolaena grandiflora (Wild Rose)			
151.	4746	Diplopeltis huegelii			
152.		Dodonaea aptera (Coast Hop-bush)			
153.		Dodonaea inaequifolia			
154.		Dodonaea viscosa subsp. angustissima			
155. 156		Duperreya sericea  Duperreya sericea			
156. 157.		Dysphania plantaginella Dysphania sphaerosperma			
157.		Ehrharta longiflora (Annual Veldt Grass)	Υ		
159.		Enchylaena tomentosa (Barrier Saltbush)	ľ		
160.		Enchylaena tomentosa var. tomentosa (Barrier Saltbush)			
161.		Eragrostis barrelieri	Υ		
162.	378	Eragrostis dielsii (Mallee Lovegrass)			
163.	380	Eragrostis eriopoda (Woollybutt Grass, Wangurnu)			
164.	392	Eragrostis pergracilis			
165.	13954	Eremaea dendroidea			
166.	2512	Eremophea aggregata			
167.		Eremophila clarkei (Turpentine Bush)			
168.		Eremophila decipiens subsp. decipiens			
169.		Eremophila fraseri subsp. fraseri			
170. 171		Eremophila glabra (Tar Bush)			
171. 172.		Eremophila glabra subsp. albicans Eremophila glabra subsp. glabra			
172.		Eremophila glabra subsp. psammophora			
174.		Eremophila glabra subsp. tomentosa			
175.		Eremophila mackinlayi subsp. mackinlayi			
			Departmen	t of Biodiversity,	WESTERN







	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
176.	7238	Eremophila maitlandii (Shark Bay Poverty Bush)			
177.		Eremophila oldfieldii (Pixie Bush)			
178.	17168	Eremophila oldfieldii subsp. oldfieldii			
179.	7247	Eremophila oppositifolia (Weeooka)			
180.	15155	Eremophila youngii subsp. youngii			
181.		Eriachne pulchella (Pretty Wanderrie)			
182.		Erodium cicutarium (Common Storksbill)	Υ		
183.		Erodium cygnorum (Blue Heronsbill)			
184.		Erymophyllum ramosum subsp. involucratum			
185.		Eucalyptus baiophylla			
186. 187.		Eucalyptus foecunda (Narrow-leaved Red Mallee) Eucalyptus fruticosa			
188.		Eucalyptus mannensis subsp. vespertina			
189.		Eucalyptus obtusiflora (Dongara Mallee)			
190.		Eucalyptus oraria (Ooragmandee)			
191.		Eucalyptus prominens			
192.		Eucalyptus rigidula (Stiff-leaved Mallee)			
193.	5762	Eucalyptus roycei (Shark Bay Mallee)			
194.	11011	Eulalia aurea			
195.	4617	Euphorbia australis (Namana)			
196.	35307	Euphorbia australis var. australis			
197.	4620	Euphorbia boophthona (Gascoyne Spurge)			
198.	4626	Euphorbia drummondii (Caustic Weed, Piwi)			
199.		Euphorbia philochalix			
200.		Euphorbia sharkoensis			
201.		Euphorbia tannensis subsp. eremophila (Desert Spurge)			
202.		Exocarpos aphyllus (Leafless Ballart)			
203.		Exocarpos sparteus (Broom Ballart, Djuk)			
204.		Frankenia pauciflora (Seaheath)			
205. 206.		Frankenia setosa (Bristly Frankenia)			
207.		Gayralia oxysperma Gemmabryum austrosabulosum			
208.		Glycine canescens (Silky Glycine)			
209.		Gnephosis arachnoidea (Cobwebby-headed Gnephosis)			
210.		Gnephosis brevifolia (Short-leaved Gnephosis)			
211.		Gnephosis gynotricha			
212.	8002	Gnephosis tenuissima			
213.	7495	Goodenia berardiana			
214.	7514	Goodenia havilandii			
215.	12554	Goodenia ochracea			
216.	2001	Grevillea eriostachya (Flame Grevillea, Kaliny-kalinypa)			
217.		Grevillea hakeoides subsp. stenophylla			
218.		Grevillea stenobotrya			
219.		Griffithsia heteromorpha			
220.		Gunniopsis septifraga			
221. 222.		Gyrostemon ramulosus (Corkybark)  Hakea recurva subsp. recurva			
223.		Hakea stenophylla			
224.		Hakea stenophylla subsp. notialis			
225.		Hakea stenophylla subsp. stenophylla			
226.		Halgania cyanea var. Allambi Stn (B.W. Strong 676)			
227.	6691	Halgania integerrima			
228.	6693	Halgania littoralis			
229.	26894	Halimeda macroloba			
230.	131	Halodule uninervis			
231.	164	Halophila ovalis (Sea Wrack)			
232.		Haloragis gossei var. inflata			
233.		Haloragis trigonocarpa			
234.		Hannafordia quadrivalvis subsp. quadrivalvis			
235.		Hannafordia quadrivalvis subsp. recurva	V		
236.		Helianthus annuus (Sunflower, Common Sunflower)	Υ		
237. 238.		Heliotropium ammophilum Heliotropium curassavicum (Smooth Heliotrope)			
238.		Hibiscus drummondii (Drummond's Hibiscus)			
240.		Hibiscus sturtii (Sturt's Hibiscus)			
241.		Hibiscus sturtii var. truncatus			
242.		Hordeum leporinum (Barley Grass)	Υ		
243.		Hyalosperma glutinosum subsp. venustum			
244.	26970	Hypnea pannosa			
245.	3971	Indigofera boviperda			
			Department Conservati	t of Biodiversity,	WESTERN







	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
246.		Indigofera georgei (Bovine Indigo)			
247.		Indigofera melanosticta			
248.		Ipomoea pes-caprae subsp. brasiliensis			
249. 250.		Isotropis sp. Shark Bay (M.E. Trudgen 7170)  Jasminum calcareum			
250. 251.		Jasminum sp. Exmouth (G. Marsh 77)			
252.		Kennedia prostrata (Scarlet Runner)			
253.		Labichea cassioides			
254.		Lamarchea hakeifolia			
255.	11772	Lamarchea hakeifolia var. hakeifolia			
256.	48408	Laurencia dendroidea			
257.	13289	Lawrencella davenportii			
258.	4953	Lawrencia densiflora			
259.	4960	Lawrencia viridigrisea			
260.		Lechenaultia linarioides (Yellow Leschenaultia)			
261.		Lechenaultia subcymosa (Wide-branching Leschenaultia)			
262.		Lepidium linifolium			
263.		Lepidium rotundum (Veined Peppercress)			
264. 265.		Lobelia heterophylla (Wing-seeded Lobelia)  Lobelia heterophylla subsp. heterophylla			
266.		Lobelia heterophylla subsp. pilbarensis			
267.		Lomandra collina (Pale Mat Rush)			
268.		Lomandra maritima			
269.		Lotus australis (Austral Trefoil)			
270.		Lotus cruentus (Redflower Lotus)			
271.		Lysiana casuarinae			
272.		Lysiana linearifolia			Υ
273.	2535	Maireana appressa			
274.	2537	Maireana brevifolia (Small Leaf Bluebush)			
275.		Maireana planifolia (Low Bluebush)			
276.		Maireana stipitata			
277.		Maireana tomentosa (Felty Bluebush)			
278.		Maireana tomentosa subsp. tomentosa			
279. 280.		Maireana trichoptera (Downy Bluebush)  Malleostemon pedunculatus			
281.		Marsdenia australis			
282.		Marsdenia graniticola			
283.		Melaleuca acuminata subsp. acuminata			
284.	5887	Melaleuca cardiophylla (Tangling Melaleuca)			
285.	5908	Melaleuca eleuterostachya			
286.	19452	Melaleuca eulobata			
287.	19525	Melaleuca keigheryi			
288.	5930	Melaleuca leiopyxis			
289.		Microbryum davallianum			
290.		Millotia myosotidifolia			
291.		Minuria leptophylla (Minnie Daisy)			
292.		Mirbelia balsiformis			
293. 294.		Mirbelia ramulosa  Muellerolimon salicorniaceum			
294. 295.		Myoporum insulare (Blueberry Tree, boobialla)			
296.		Nicotiana glauca (Tree Tobacco)	Υ		
297.		Nicotiana occidentalis (Native Tobacco)			
298.		Nicotiana occidentalis subsp. hesperis			
299.		Nicotiana occidentalis subsp. obliqua			
300.	11856	Nicotiana occidentalis subsp. occidentalis			
301.	4366	Nitraria billardierei (Nitre Bush)			
302.	16390	Oenothera drummondii subsp. drummondii	Υ		
303.		Olearia axillaris (Coastal Daisybush)			
304.		Olearia pimeleoides (Pimelea Daisybush, Burrobunga)			
305.		Olearia sp. Kennedy Range (G. Byrne 66)			
306.		Opercularia spermacocea			
307.		Ophioglossum gramineum	.,		
308.		Orobanche minor (Lesser Broomrape)	Υ		
309. 310.		Paractaenum novae-hollandiae (Reflexed Panic Grass)			
310. 311.		Paractaenum novae-hollandiae subsp. novae-hollandiae Parietaria debilis (Pellitory)			
311.		Paspalidium reflexum			
313.		Passiflora foetida (Stinking Passion Flower)	Υ		
314.		Pembertonia latisquamea	-		
315.	27121	Penicillus nodulosus			
			Department Conservation	of Biodiversity,	WESTERN







1916.   1917   Projections acquired field Society		Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
1318.   17.02   Pilopotentus creatives			· · · · · · · · · · · · · · · · · · ·			
1915						
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2011						
1922						
323. 5500 Pilospecimen philipsockies (Weigring Pilospecimen, Valid) 325. 45200 Pilospecimen philipsockies (Weigring Pilospecimen, Valid) 326. 45200 Pilospecimen philipsockies (Weigring Pilospecimen, Valid) 327. 8170 Pilospecimen apparation (Weigring Pilospecimen) 328. 8171 Pilospecimen apparation (Weigring Valid) 329. 81812 Pilospecimen apparation (Weigring Valid) 330. 81812 Pilospecimen apparation (Weigring Valid) 331. 81812 Pilospecimen apparation (Weigring Valid) 332. 27178 Pilospecimen apparation (Weigring Valid) 333. 27178 Pilospecimen apparation (Weigring Valid) 335. 4800 Pilospecimen (Weigring Valid) 336. 4800 Pilospecimen (Weigring Valid) 337. 27179 Pilospecimen (Weigring Valid) 338. 2727 Pilospecimen (Weigring Valid) 339. 2727 Pilospecimen (Weigring Valid) 339. 2727 Pilospecimen (Weigring Valid) 339. 2727 Pilospecimen (Weigring Valid) 340. 2747 Pilospecimen (Weigring Valid) 341. 11136 Pilospecimen (Weigring Valid) 342. 2747 Pilospecimen (Weigring Valid) 343. 2747 Pilospecimen (Weigring Valid) 344. 47414 Open period (Weigring Valid) 345. 47414 Open period (Weigring Valid) 346. 47414 Open period (Weigring Valid) 347. 8107 Review (Weigring Valid) 348. 2748 Pilospecimen (Weigring Valid) 349. 7841 Open period (Weigring Valid) 340. 7841 Open period (Weigring Valid) 341. 11137 Open period (Weigring Valid) 342. 2741 Open period (Weigring Valid) 343. 2741 Open period (Weigring Valid) 344. 47414 Open period (Weigring Valid) 345. 47414 Open period (Weigring Valid) 346. 47414 Open period (Weigring Valid) 347. 8107 Review (Weigring Valid) 348. 27410 Pilospecime (Weigring Valid) 349. 7841 Pilospecime (Weigring Valid) 340. 7841 Open period (Weigring Valid) 341. 1113 Open period (Weigring Valid) 342. 47414 Open period (Weigring Valid) 343. 1741 Open period (Weigring Valid) 344. 1741 Open period (Weigring Valid) 345. 1741 Open period (Weigring Valid) 346. 1741 Open period (Weigring Valid) 347. 1741 Open period (Weigring Valid) 348. 1741 Open period (Weigring Valid) 349. 1741 Open period (Weigring Valid) 349. 1741 Open						
25.						
326.         B173 Publiships introceptables           228.         B176 Publiships introceptables           229.         B178 Publiships introceptables           230.         B1814 Publiships any publishiotists (Galders Long Headel)           331.         Publishioso graphatiotists (Galders Long Headel)           331.         Publishioso graphatiotists (Galders Long Headel)           334.         2716 Publishioso exposition           335.         2717 Publishioso exposition (Galders) (Auto Multiply)           336.         4602 Publishio exposition (Galders) (Auto Multiply)           337.         2727 Publishio gardistribusia (Galders) (Auto Multiply)           338.         2727 Publishio gardistribusia (Auto Multiply)           340.         2727 Publishio gardistribusia (Auto Multiply)           341.         1316 Publishio decimates (Carders)           342.         2727 Publishio gardistribusia (Auto Multiply)           343.         2727 Publishio gardistribusia (Auto Multiply)           344.         2727 Publishio gardistribusia (Auto Multiply)           345.         2727 Publishio gardistribusia (Auto Multiply)           346.         2727 Publishio gardistribusia (Auto Multiply)           347.         1817 Publishio gardistribusia (Auto Multiply)           348.         2727 Publishio gardistribusia (Auto Multiply)     <	324.	41300	Pittosporum phillyreoides (Weeping Pittosporum, Yaliti)			
327.         B174 Polichapies genetically           329.         8182 Polichapies angusticinis (Singis Lamyhenda)           331.         Policharies angusticinis (Singis Lamyhenda)           332.         Polymeria D           332.         Polymeria D           333.         27178 Polypachorus espositions           334.         27178 Polypachorus respositions           335.         2717 Policharia delorantial (Christophy Moles Molle)           336.         2717 Policha delorantia (Christophy Moles Molle)           337.         2721 Policha evaluation (Family Moles Molle)           338.         2727 Policha polymeria (Policharia)           348.         2727 Policha polymeria (Policharia)           349.         2728 Policha evaluation (Family Moles Policharia)           341.         41101 Guya estriptions           342.         2737 Policha polymeria (Policharia)           343.         2748 Policha evaluation (Family Moles Policharia)           344.         4101 Guya estriptions           345.         2102 Dolicha polymeria (Policharia)           346.         2103 Dolicha polymeria (Policharia)           347.         274 Policha polymeria (Policharia)           348.         225 Policha (Policharia)           349.         225 Policha (Policharia)	325.	45240	Podolepis aristata subsp. auriculata			
328.   817   Protections proportionally	326.	8173	Podolepis capillaris (Wiry Podolepis)			
339.         819.E. Podothreca any, authorise (Carledon Long-headed)           331.         Podothreca ap.           332.         Polymenta ap.           333.         2717E Polymenta ap.           334.         2717E Polymenta ap.           335.         2717 Polluca deversible (Circling Maller Mulle)           336.         4980 Polluca constitution (Sala Mulle)           337.         2727 Polluca grandiflorus           338.         2728 Polluca grandiflorus           341.         11300 Polluca contention (Table Mulle)           341.         11300 Polluca contention variety (Prince of Water Feeder)           341.         11300 Polluca (Saladon)           342.         2727 Polluca grandiflorus           343.         2769 Polluca pollucation (Circling Muller Feeders)           343.         2769 Polluca pollucation (Circling Muller Feeders)           344.         14104 Curya antenna           345.         14104 Curya antenna           346.         14104 Curya antenna           347.         1517 Pollucation antenna (Thorny Saladon)           348.         24104 Pollucation antenna (Thorny Saladon)           349.         2250 Pollucation antenna (Thorny Saladon)           340.         2526 Pollucation antenna (Thorny Saladon)           340.<	327.		1 - 1			
301.   814 Acchance preparationis (Golden Long heads)			· · · · · ·			
331. Podorhora sp.           332. Polymenia Socialisma           333. 27178 Polypiphonia socialisma           334. 2717 Polisis deliverabile (Climbing Malie Mullia)           336. 48100 Polisis comorate           337. 2721 Polisis socialisma (Talinisma Mullia Mullia)           338. 2727 Polisis socialisma (Talinisma Mullia Mullia)           339. 2728 Polisis socialisma           340. 2727 Polisis socialisma           341. 11306 Polisis domenia via colventia           342. 2726 Polisis socialisma           343. 2726 Polisis socialisma           344. 4114 Curya carente           345. 3726 Polisis socialisma           346. 3103 Polisis domenia via colventia           347. 8117 Polisis socialisma           348. 3103 Polisis domenia via colventia           349. 3104 Curya carente           340. 3104 Curya carente           341. 3105 Polisis domenia via carente           342. 3105 Polisis domenia via carente richinary Socialisma           343. 3107 Polisisma           344. 4104 Curya carente           345. 3107 Polisisma           346. 3107 Polisisma           347. 3117 Polisisma           348. 3220 Polisisma           349. 3221 Polisisma           349. 3222 Polisisma           349. 3223 Polisisma           349. 3224 Polisisma <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>						
332.   Phylyphornia sogularium		8184				
933.         27178 Polysphomis exceptiones           394.         2717 Pillous diversatus (Christing Male Mulle)           395.         2717 Pillous exceptiones           397.         2721 Pillous exceptiones           398.         2727 Pillous exceptiones           399.         2727 Pillous exceptiones           341.         11986 Pillous exceptiones           342.         2747 Pillous exceptiones           243.         2757 Pillous exceptiones           344.         2756 Pillous explanations (Pillous et Weise Feather)           343.         2756 Pillous explanations (Pillous et Weise Feather)           344.         2766 Pillous explanations (Pillous et Weise Feather)           345.         41903 Occype currents           346.         2760 Pillous explanations (Pillous et Weise Feather)           347.         2817 Pillous explanations (Pillous et Weise Feather)           348.         2818 Pillous et Republic et Republic (Pillous et Weise Feather)           349.         2817 Pillous explanation explanations (Pillous et Weise Feather)           340.         2817 Pillous explanation explanations (Pillous et Weise Feather)           341.         2817 Pillous explanation explanations (Pillous et Weise Feather)           342.         2818 Pillous explanation explanations (Pillous et Weise Feather) <t< th=""><th></th><th></th><th>•</th><th></th><th></th><th></th></t<>			•			
334.         2712 Pulsation are regions           335.         43602 Pulsation enviroles           336.         48602 Pulsation enviroles           337.         272 Pulsation generalization           338.         2727 Pulsation generalization           340.         2727 Pulsation generalization           341.         1336 Pulsation deloveration (Control Buch)           342.         2775 Pulsation deloveration (Control Buch)           343.         2776 Pulsation deloveration (Control Buch)           344.         4104 Outry an appointment your (Protect of Males Feather)           345.         4104 Outry an appointment your (Protect of Males Feather)           346.         4104 Outry an appointment your (Protect of Males Feather)           347.         18117 Protectional implicitus (Protect of Males Statistics)         V           348.         2780 Protection control (Protection of Males Statistics)         V           349.         2853 Protection of Implicitus (Protection of Males Statistics)         V           340.         1278 Protection of Implicitus (Protection of Males Statistics)         V           341.         2583 Protection of Implicitus (Protection of Males Statistics)         V           342.         2584 Protection of Implicitus (Protection of Males Statistics)         V           343.         123		27178				
335.         2717 Pibliota diversibate (Climbring Mulle)           337.         2721 Pibliota constitute (Tall Mulls)           338.         2727 Pibliota grandiflores           339.         2727 Pibliota grandiflores           341.         11398 Pibliota obversible (and obversible)           341.         2737 Pibliota obversible (and obversible)           342.         2737 Pibliota obversible (and obversible)           343.         2736 Pibliota obversible (and obversible)           344.         41041 Coursy ampriliciona           345.         41042 Coursy ampriliciona           345.         41043 Coursy ampriliciona           346.         3407 Residentific inciplina (Fried Scheribid)         Y           347.         3517 Residentific inciplina (Fried Scheribid)         Y           348.         2638 Ribagoria (anticla)         Y           349.         2638 Ribagoria (anticla)         Y           351.         2648 Ribagoria (anticla)         Y           352.         11210 Ribagoria (anticla)         Y           353.         11220 Ribagoria (anticla)         Y           354.         1230 Ribagoria (anticla)         Y           355.         1231 Ribagoria (anticla)         Y           356.         1232 Ribagoria (an						
337.   271 Pilotes evaluation (Tab Mulli Mulliu)						
338	336.	48602	Ptilotus eremita			
338.   2728   Pilotos grantifloras   341.   11366   Pilotos polyatalyus (Prince of Wales Feather)   341.   11366   Pilotos polyatalyus (Prince of Wales Feather)   342.   2775   Pilotos polyatalyus (Prince of Wales Feather)   343.   2776   Pilotos polyatalyus (Prince of Wales Feather)   344.   4104   Curya atipicina   345.   41043   Curya atipicina   346.   3051   Raphanus rephraitirum (Wild Radial)   Y   347.   3051   Raphanus rephraitirum (Wild Radial)   Y   348.   2582   Rhagodia oranosa (Tromy Sattoch)   Y   348.   2582   Rhagodia oranosa (Tromy Sattoch)   349.   2583   Rhagodia fatifolia subre, sitrifolia   350.   11728   Rhagodia fatifolia subre, sitrifolia   350.   11728   Rhagodia fatifolia subre, sitrifolia   351.   2584   Rhagodia priesisi subre, opositifolia   352.   11340   Rhagodia priesisi subre, opositifolia   353.   13330   Rhochanthe cuttre   3544.   13391   Rhochanthe cuttre   3544.   13391   Rhochanthe expression   3545.   13338   Rhochanthe maponisi   3555.   13338   Rhochanthe maponisi   3565.   13338   Rhochanthe maponisi   3574   13328   Rhochanthe maponisi   3574   13328   Rhochanthe maponisi   3584   13328   Rhochanthe polyeophasia   3584   13328   133	337.	2721	Ptilotus exaltatus (Tall Mulla Mulla)			
340						
11306   Pillotus obreatus var. obreatus var. obreatus						
342 275 Pilotus polystochrus (Prince of Water Feather) 343. 2766 Pilotus villedizotus 344. 14141 Outrya artipicitus 345. 41043 Outrya artipicitus 346. 340. 3016 Raphanis raphanistrum (Wild Radeh) V 347. 8197 Rechtardis ingistiums (False Southistie) V 348. 2582 Rhappolia setholia 349. 2582 Rhappolia setholia villedizolia 350. 11728 Rhappolia setholia villedizolia 351. 2564 Rhappolia preissi villedizolia 351. 1256 Rhappolia preissi villedizolia 352. 1120 Rhappolia preissi villedizolia 353. 31300 Rhodanthe coliria 354. 1321 Rhodanthe coliria 354. 1321 Rhodanthe coliria 355. 13238 Rhodanthe murboiditana 356. 13238 Rhodanthe murboiditana 357. 1328 Rhodanthe murboiditana 358. 1326 Rhodanthe murboiditana 358. 1326 Rhodanthe murboiditana 359. 81234 Rhodanthe murboiditana 350. Rocus abdul 361. 4514 Robauboidia chilacorapa var. cheliboarpa 362. 4638 Roopen bilariforoi 363. 46388 Roopen soviat 364. 41111 Rostanta pumile 365. 46438 Rumer kynogenus 370. 4705 Surropus grotulus (Fartochrood, Wildrak) 370. 4705 Surropus crassificius 371. 4705 Surropus crassificius 372. 7605 Suevola crassificius (Tinck-leaved Fan-flower) 373. 774 Surropus crassificius (Firer Pop Bush) 374. 4764 Surropus crassificius (Firer Pop Bush) 375. 41600 Schenica aussifica (Cirron Bush, Marono) 376. 44690 Sulcoria cassifica (Firer Pop Bush) 377. 1002 Schenica aussifica (Cirron Bush, Marono) 378. 41600 Schenica aussifica (Cirron Bush, Marono) 379. 44690 Schenica aussifica (Cirron Bush, Marono) 370. 4705 Scaevola transcribicia (Firer Pop Bush) 370. 4625 Schenica aussifica (Cirron Bush, Marono) 371. 5705 Scaevola transcribicia (Firer Pop Bush) 372. 5705 Scaevola transcribicia (Firer Pop Bush) 373. 44690 Schenica aussifica (Cirron Bush, Marono) 374. 4506 Schenica aussifica (Cirron Bush, Marono) 375. 46400 Scaevola transcribicia (Firer Pop Bush) 376. 46400 Scaevola transcribicia (Firer Pop Bush) 377. 5705 Scaevola transcribicia (Firer Pop Bus						
343.   2766 Pilotus villosafinorus   344.   41041 Outoya stripotaria   345.   3461						
344.         41041         Queya cripatina           345.         41043         Queya crinasta           346.         3016         Parkartunis raphanistrum (Wild Radish)         Y           347.         8197         Reichardia tingiliana (Falles Sowthistale)         Y           348.         2582         Rhappodia tertificial scale (Falles)         Y           349.         2583         Rhappodia tertificial scale (Falles)         Y           351.         2584         Rhappodia tertificial scale (Falles)         Y           351.         2584         Rhappodia priessi scale (Falles)         Y           352.         11240         Rhappodia priessi scale (Falles)         Y           353.         13000         Rhoctenthe civine         X           354.         13234         Rhoctenthe contentes (Falles)         Y           355.         13234         Rhoctenthe amount of package (Falles)         Y           366.         13234         Rhoctenthe amount of package (Falles)         Y           367.         4343         Rhoctenthe amount of package (Falles)         Y           368.         1369         Rhoctenthe amount of package (Falles)         Y           368.         2436         Rhoctenthe amount of package (Falle						
346.         41043         Quyya cuneata           347.         8197         Raphranz raphraistum (Wild Radish)         Y           348.         2582         Rhagodia erramea (Tromy Satturah)         Y           348.         2583         Rhagodia latifolia         Y           349.         2583         Rhagodia latifolia         Y           351.         2584         Rhagodia preissii         Y           352.         11240         Rhagodia preissii subsp. obovate         Y           353.         13300         Rhoddinthe curlomate         Y           354.         12301         Rhodenthe curlomate         Y           355.         13246         Rhodenthe bodienta         Y           356.         13238         Rhodenthe polycephale         Y           357.         13249         Rhodenthe sincia         Y           361.         48154         Robubelella chelikorape var. cheliccarpe         Y           362.         48837         Rooper a billiordirei           363.         48430         Salcoura pumilo         Y           364.         11151         Rostraria pumilo         Y           365.         46434         Ruram krypopeur         Y						
346.         3011 Raphanus raphanistrum (Milk Radish)         Y           347.         8167 Reichards ingitana (False Southiste)         Y           348.         2528 Phagodia normaea (Thomy Satibush)           350.         11728 Phagodia Isalifolis subsp. Infolis           351.         2594 Phagodia prisissi subsp. obovata           351.         2594 Phagodia prisissi subsp. obovata           352.         11240 Rhagodia prisissi subsp. obovata           353.         1300 Phichatinite oritina           354.         13391 Phichatinite oritina           355.         13248 Phichatinite oritina           356.         13248 Phichatinite opositifolia subsp. oppositifolia           357.         13249 Phichatinite opositifolia subsp. oppositifolia           358.         13289 Phichatinite atricia           360.         Riccia alticia           361.         45154 Poebuckiello chellicaripa var. cheliocarpa           362.         44887 Prospera bullirdiarei           363.         48988 Rospera ovata           364.         11151 Rostoria pumila         Y           365.         2443 Rumes vesicaria (Ruby Dock)         Y           366.         2443 Rumes vesicaria (Ruby Dock)         Y           367.         46440 Shationing upringelloria      3						
348.   2582   Rhagodia termaea (Thorry Seltbush)   349.   2583   Rhagodia termaea (Thorry Seltbush)   350.   3517.   2584   Rhagodia prelasii subsp. deviolia   351.   2584   Rhagodia prelasii subsp. deviata   353.   1320   Rhodanthe cirina   353.   1330   Rhodanthe cirina   354.   1323   Rhodanthe cirina   355.   3246   Rhadonthe humbolidana   355.   3246   Rhodanthe mayorii   357.   3248   Rhodanthe appositiolia subsp. oppositifolia   358.   13298   Rhodanthe popositifolia subsp. oppositifolia   358.   13298   Rhodanthe sprincia   358.   3298   Rhodanthe sprincia   359.   3254   Rhodanthe sprincia   359.   3				Υ		
349.   2583   Rhagodia latifolia   350.   11728   Rhagodia latifolia   350.   11728   Rhagodia   11728   R	347.	8197	Reichardia tingitana (False Sowthistle)	Υ		
350.         11728 Rhagodia Infolias subsp. Initiolia           351.         2584 Rhagodia preissii subsp. obovata           352.         11240 Rhagodia preissii subsp. obovata           353.         13300 Rhodanthe clinine           354.         13291 Rhodanthe humboklitiana           355.         13248 Rhodanthe humboklitiana           356.         13238 Rhodanthe appositifolia subsp. oppositifolia           357.         13248 Rhodanthe appositifolia subsp. oppositifolia           358.         13266 Rhodanthe spricis           360.         Riccia albida           361.         45154 Roebuckleifa cheliocarpa var. cheliocarpa           362.         48887 Roepara billiardiarei           363.         48898 Roepara ovata           364.         41151 Roesarria pumila         Y           365.         48434 Rumex vesicanius (Ruby Dock)         Y           366.         2443 Rumex vesicanius (Ruby Dock)         Y           367.         4868 Roepara autuminatum (Ouandong, Warnga)           368.         2350 Santalum sacurimatum (Ouandong, Warnga)           369.         2455 Santalum sacurimatum (Ouandong, Warnga)           370.         4706 Sauropus crassifolius           371.         7668 Seevola aprissolio (Thick-leaved Fan-flower)           372. <th>348.</th> <th>2582</th> <th>Rhagodia eremaea (Thorny Saltbush)</th> <th></th> <th></th> <th></th>	348.	2582	Rhagodia eremaea (Thorny Saltbush)			
351.         2584 Rhagodia preissii sibsp. obovata           352.         11240 Rhagodia preissii sibsp. obovata           353.         13300 Rhodanthe cutime           354.         13291 Rhodanthe modelitana           355.         13248 Rhodanthe maryonii           357.         13249 Rhodanthe maryonii           358.         13268 Rhodanthe propositifolia subsp. oppositifolia           359.         13254 Rhodanthe stricta           360.         Riccia albida           361.         45154 Rebotivchila chelilocarpa var. chelilocarpa           362.         48897 Rospera billierdireirei           363.         48898 Rospera ovata           364.         11151 Rostaria pumila         Y           365.         46434 Rumex kipopagaus         Y           366.         46438 Rumex kipopagaus         Y           367.         48430 Salconia quinquellora         Y           368.         2356 Santalum acuminatum (Quandong, Wanga)         Y           369.         2505 Santalum spicatum (Santalvood, Wilarak)         Y           370.         4706 Sauropus crassifolius         Y           371.         7506 Scaevola crassifolius (Thick-leaved Fan-flower)         Y           372.         7606 Scaevola crassifolia (Ragodilala Fanfower)	349.	2583	Rhagodia latifolia			
11240   Rhagodia preissii subsp. obovata						
353.       1330 Rhodanthe citrina         354.       13291 Rhodanthe condensata         355.       13238 Rhodanthe mayoni         357.       13249 Rhodanthe popositifolia subsp. oppositifolia         358.       13296 Rhodanthe popositifolia subsp. oppositifolia         359.       13254 Rhodanthe popositifolia subsp. oppositifolia         360.       Riccia albúla         361.       45154 Roebuckiella cheilocarpa var. cheilocarpa         362.       48887 Roepera Ovata         363.       48887 Roepera ovata         364.       11151 Rostraria pumila       Y         365.       46434 Rumev kesicanius (Ruby Dock)       Y         366.       2443 Rumev vesicanius (Ruby Dock)       Y         367.       48430 Salicornia quintqueflora         368.       2356 Santalum spicatum (Sandalwood, Wilarak)         370.       4706 Sauropus crassifolia (Thick-leaved Fan-flower)         371.       763 Scaevola archisifolia         372.       7606 Scaevola crassifolia (Thick-leaved Fan-flower)         373.       7644 Scaevola spinseoris (Currart Bush, Maroon)         374.       764 Scaevola tomaticas (Raggedial Fanllower)         375.       41660 Schenkia astralis         376.       4505 Schonius asp. G Broad Sheath (K.L. Wilson 2633)						
354.         13291 Rhodanthe condensata           355.         13246 Rhodanthe humboldiana           356.         13238 Rhodanthe oppositifolia subsp. oppositifolia           357.         13249 Rhodanthe oppositifolia subsp. oppositifolia           359.         13254 Rhodanthe polycephala           359.         13254 Rhodanthe polycephala           360.         Ricoia altiida           361.         45154 Roebuckiella cheliocarpa var. cheliccarpa           362.         48887 Roepera billardireri           363.         48888 Roepera ovata           364.         11151 Rostraria pumila         Y           365.         2443 Rumex veisicarius (Ruby Dock)         Y           366.         2443 Rumex veisicarius (Ruby Dock)         Y           367.         48430 Salicornia quinqueflora           368.         2356 Santalum accumiratum (Ouandorg, Warnga)           369.         2359 Santalum spicatum (Sandalwood, Wilarak)           371.         7595 Scaevola anchusifolia           372.         7606 Scaevola crassifolia (Thick-leaved Fan-flower)           373.         7644 Scaevola signasesses (Currant Bush, Marcon)           374.         7648 Scaevola schoenia cassiriala           375.         41660 Schoenia cassiriala (Schoenia)           377.						
355.         13248         Rhodanthe humbolditiane           356.         13238         Rhodanthe maryonii           357.         13249         Rhodanthe polycephala           359.         13254         Rhodanthe stricte           360.         Riccia albida           361.         45154         Roebuckiella cheliocarpa var. cheliocarpa           362.         48887         Roepera Olitardirei           363.         48881         Roepera Owata           364.         11151         Rostraria pumila         Y           365.         46434         Rumer Verjoageus         Y           366.         4243         Rumer versicarius (Ruby Dock)         Y           367.         48430         Salicornia quinqueflora         Y           368.         2356         Santalum apicatumi (Santalwood, Wilarak)           370.         4706         Sauropus crassifolius           371.         7595         Scaevola anchusifolia           372.         7608         Scaevola crassifolia (Thick-leaved Fan-flower)           373.         7644         Scaevola crassifolia (Thick-leaved Fan-flower)           375.         41600         Schenka isustralia           376.         8200         Schenka isustra						
356.       13288 Rhodanthe maryonii         357.       13249 Rhodanthe oppositifolia subsp. oppositifolia         358.       13296 Rhodanthe polycephale         369.       13254 Rhodanthe stricta         760.       Riccia alticla         361.       45154 Robuckiëlla cheliocarpa var. cheliocarpa         362.       48887 Roepera billardierei         363.       48988 Roepera ovata         364.       11151 Rosteria pumila       Y         365.       46434 Rumex hypogeeus       Y         366.       2443 Rumex vesicarius (Ruby Dock)       Y         367.       4840 Salicomia qiuriqueflora       Y         368.       2356 Santalum acuminatum (Quandong, Warnga)       Y         369.       2359 Santalum spicatum (Sandalwood, Wilarak)       Y         370.       4706 Sauropus crassifolius       Y         371.       7595 Scaevola anchusifolia       Y         372.       7606 Scaevola spinseseens (Currant Bush, Maroon)       Y         373.       7648 Scaevola tomentosa (Raggedieaf Fanflower)       Y         375.       41660 Schenkia australia       Y         377.       1002 Schoenia cassirilara (Schoenia)       Y         378.       16254 Schoenus ap. G Broad Sheath (K.L. Wilson 2633) <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>						
357.         13249         Rhodanthe oppositifolia subsp. oppositifolia           358.         13256         Rhodanthe stricta           360.         Riccia albida           361.         45154         Roebuckiella cheliocarpa var. cheliocarpa           362.         48887         Roepera billardierei           363.         48898         Roepera ovata           364.         11151         Rostraria pumile         Y           365.         46434         Rumex hypogaeus         Y           366.         2443         Rumex vasicarius (Ruby Dock)         Y           367.         48430         Salicomia quinqueflora         Y           368.         2356         Santalum acuminatum (Quandong, Warnga)         Y           369.         2359         Santalum spicatum (Rondalwood, Wilerak)         Y           370.         4706         Sauropus crassifolius         Y           371.         7595         Scaevola anchusifolia         Y           372.         7606         Scaevola spinescens (Currant Eust, Maroon)         Y           374.         7648         Scaevola spinescens (Regeleiaf Fanflower)           375.         4160         Schenkai australia         Y           376. <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th></td<>						
359.   13254   Rhodanthe stricta   Riccia albida   Riccia albida   Riccia albida   A5154   Roebuckiella cheliocarpa var. cheliocarpa   362.   48837   Roepera billardierei   363.   48838   Roepera ovata   7   48838   Roepera ovata   7   48338   Roepera						
360.         Riccia albida           361.         45154 Roebuckiella cheilocarpa var. cheilocarpa           362.         48887 Roepera billardierei           363.         48898 Roepera ovata           364.         11151 Rostraria pumila         Y           365.         46434 Rumex kyhpogeeus         Y           366.         2443 Rumex vesicarius (Ruby Dock)         Y           367.         48430 Salicornia quinqueflora           368.         2355 Santalum acuminatum (Ouandong, Warnga)           369.         2359 Santalum spicatum (Sandalwood, Wilarak)           370.         4706 Sauropus crassifolius           371.         7595 Scaevola anchusifolia           372.         7606 Scaevola crassifolia (Tinck-leaved Fan-flower)           373.         7644 Scaevola spinescens (Currant Bush, Maroon)           374.         7648 Scaevola iomentosa (Ragedleaf Fanflower)           375.         41660 Schoenika australis           376.         8200 Schoenia cassiniana (Schoenia)           377.         1002 Schoenus anus (Tiny Bog Rush)           378.         1625 Schoenus sp. G Broad Sheath (K.L. Wilson 2633)           380.         2609 Sclerolaena elurotioides (Fluffy Bindii)           381.         2612 Sclerolaena eurotioides (Fluffy Bindii)	358.	13296	Rhodanthe polycephala			
361.       45154       Roebuckiella cheilocarpa var. cheilocarpa         362.       48887       Roepera billardierei         363.       48888       Roepera ovata         364.       11151       Rostraria pumila       Y         365.       46434       Rumex hypogaeus       Y         366.       2443       Rumex vesicarius (Ruby Dock)       Y         367.       48430       Salicomia quinqueflora         368.       2356       Santalum acuminatum (Quandong, Warnga)         369.       2359       Santalum spicatum (Sandalwood, Wilarak)         370.       4706       Sauropus crassifolius         371.       7595       Scaevola anchusifolia         372.       7605       Scaevola erassifolia (Thick-leaved Fan-flower)         373.       7644       Scaevola spinescens (Currant Bush, Maroon)         374.       7648       Scaevola tomentosa (Raggedieaf Fanflower)         375.       41660       Schoenia australis         376.       8200       Schoenia spinescens (Currant Bush, Millower)         378.       16254       Schoenus sp. G Broad Sheath (K.L. Wilson 2633)         379.       44567       Scholizia obovata         381.       2612       Sclerolaena diacantha (Grey Copperbur	359.	13254	Rhodanthe stricta			
362.       48887 Roepera billardierei         363.       48898 Roepera ovata         364.       11151 Rostraria pumila       Y         365.       46434 Rumex hypogaeus       Y         366.       2443 Rumex vesicarius (Ruby Dock)       Y         367.       48430 Salicornia quinquelfora       ***         368.       2356 Santalum spicatum (Quandong, Warnga)       ***         369.       2359 Santalum spicatum (Sandalwood, Wilarak)       ***         370.       4706 Sauropus crassifolius       ***         371.       7595 Scaevola anchusifolia       ***         372.       7606 Scaevola crassifolia (Thick-leaved Fan-flower)       ***         373.       7644 Scaevola spinescens (Currant Bush, Maroon)       ***         374.       7648 Scaevola tomentosa (Raggedleaf Fanflower)       ***         375.       41600 Schenkia australis       ***         376.       8200 Schoenus anaus (Tiny Bog Rush)       ***         378.       1625 Schoenus sanus (Tiny Bog Rush)         380.       2609 Sclerolaena diacantha (Grey Copperburr)         381.       2612 Sclerolaena eurotioides (Fluffy Bindii)         382.       2628 Sclerolaena recurvicuspis         383.       2633 Sclerolaena recurvicuspis         3	360.		Riccia albida			
363.         48898         Roepera ovata           364.         11151         Rostraria pumila         Y           365.         46434         Rumex hypogaeus         Y           366.         2443         Rumex vesicarius (Ruby Dock)         Y           367.         48430         Salicomia quinquellora         Y           368.         2356         Santalum acuminatum (Quandong, Warnga)         Y           369.         2359         Santalum spicatum (Sandalwood, Wilarak)         Santalum spicatum (Sandalwood, Wilarak)           370.         4706         Sauropus crassifolius         Santalum spicatum (Sandalwood, Wilarak)           371.         7595         Scaevola archusifolia         Santalum spicatum (Sandalwood, Wilarak)           372.         7606         Scaevola crassifolia (Thick-leaved Fan-flower)         Sandaly (Thick-leaved Fan-flower)           373.         7644         Scaevola spinescens (Currant Bush, Maroon)         Sandaly (Thick-leaved Fan-flower)           374.         7648         Scaevola tomentosa (Raggedleaf Fanflower)           375.         41660         Schoenia a (Raggedleaf Fanflower)           376.         8200         Schoenia a (Schoenia)           379.         44567         Schoenus sp. G Broad Sheath (K.L. Wilson 2633)						
364.       11151       Rostraria pumile       Y         365.       46434       Rumex hypogaeus       Y         366.       2443       Rumex vesicarius (Ruby Dock)       Y         367.       48430       Salicornia quinquellora         368.       2356       Santalum acuminatum (Quandong, Warnga)         369.       2359       Santalum spicatum (Sandalwood, Wilarak)         370.       4706       Sauropus crassifolius         371.       7595       Scaevola anchusifolia         372.       7606       Scaevola crassifolia (Thick-leaved Fan-flower)         373.       7644       Scaevola spinescens (Currant Bush, Maroon)         374.       7648       Scaevola tomentosa (Raggedleaf Fanilower)         375.       41660       Schenkia australis         376.       8200       Schoenia cassiniana (Schoenia)         377.       1002       Schoenus sp. G Broad Sheath (K.L. Wilson 2633)         379.       44567       Scholtzia obovata         380.       2609       Sclerolaena diacantha (Grey Copperburr)         381.       2612       Sclerolaena euratioides (Fluffy Bindii)         382.       2628       Sclerolaena a nuilliora (Two-spined Saltbush)         384.       12276       Senn			·			
365.       46434       Rumex hypogaeus       Y         366.       2443       Rumex vesicarius (Ruby Dock)       Y         367.       48430       Salicornia quinqueflora         368.       2356       Santalum acuminatum (Quandong, Warnga)         369.       2359       Santalum scicatum (Sandalwood, Wilarak)         370.       4706       Sauropus crassifolius         371.       7595       Scaevola anchusifolia         372.       7606       Scaevola crassifolia (Thick-leaved Fan-flower)         373.       7644       Scaevola spinescens (Currant Bush, Maroon)         374.       7648       Scaevola tomentosa (Raggedleaf Fanflower)         375.       41660       Schenkia australis         376.       8200       Schoenia cassiniana (Schoenia)         377.       1002       Schoenus ansus (Tiny Bog Rush)         378.       16254       Schoenus sp. G Broad Sheath (K.L. Wilson 2633)         389.       2609       Sclerolaena diacantha (Grey Copperburr)         381.       2612       Sclerolaena eurotioides (Fluffy Bindii)         382.       2628       Sclerolaena eurotioides (Fluffy Bindii)         383.       2633       Sclerolaena auratemisioides subsp. hilliolia         384.       12276 <th></th> <th></th> <th></th> <th>V</th> <th></th> <th></th>				V		
366.       2443 Rumex vesicarius (Ruby Dock)       Y         367.       48430 Salicomia quinqueflora         368.       2356 Santalum acuminatum (Quandong, Warnga)         369.       2359 Santalum spicatum (Sandalwood, Wilarak)         370.       4706 Sauropus crassifolius         371.       7595 Scaevola anchusifolia         372.       7606 Scaevola crassifolia (Thick-leaved Fan-flower)         373.       7644 Scaevola spinescens (Currant Bush, Maroon)         374.       7648 Scaevola tomentosa (Raggedleaf Fanflower)         375.       41660 Schenkia australis         376.       8200 Schoenia cassiniana (Schoenia)         377.       1002 Schoenia snanus (Tiny Bog Rush)         378.       16254 Schoenus sp. G Broad Sheath (K.L. Wilson 2633)         379.       44567 Scholtzia obovata         380.       2609 Sclerolaena diacantha (Grey Copperburr)         381.       2612 Sclerolaena eurotioides (Fluffy Bindii)         382.       2628 Sclerolaena recurvicuspis         383.       2633 Sclerolaena millora (Two-spined Saltbush)         384.       12276 Senna artemisioides subsp. helmsii						
367. 48430 Salicornia quinqueflora 368. 2356 Santalum acuminatum (Quandong, Warnga) 369. 2359 Santalum spicatum (Sandalwood, Wilarak) 370. 4706 Sauropus crassifolius 371. 7595 Scaevola anchusifolia 372. 7606 Scaevola crassifolia (Thick-leaved Fan-flower) 373. 7644 Scaevola tomentosa (Raggedleaf Fanflower) 375. 41660 Schenkia australis 376. 8200 Schenkia australis 377. 1002 Schoenus nanus (Tiny Bog Rush) 378. 16254 Schoenus sp. G Broad Sheath (K.L. Wilson 2633) 379. 44567 Scholtzia obovata 380. 2609 Sclerolaena eurotioides (Fluffy Bindii) 381. 2612 Sclerolaena eurotioides (Fluffy Bindii) 382. 2628 Sclerolaena eurotioides (Fluffy Bindii) 383. 2633 Sclerolaena eurotioides subsp. fillifolia 384. 12276 Senna artemisioides subsp. fellmsii			** *			
368. 2356 Santalum acuminatum (Quandong, Warnga) 369. 2359 Santalum spicatum (Sandalwood, Wilarak) 370. 4706 Sauropus crassifolius 371. 7595 Scaevola anchusifolia 372. 7606 Scaevola crassifolia (Thick-leaved Fan-flower) 373. 7644 Scaevola spinescens (Currant Bush, Maroon) 374. 7648 Scaevola tomentosa (Raggedleaf Fanflower) 375. 41660 Schenkia australis 376. 8200 Schoenia cassiniana (Schoenia) 377. 1002 Schoenus nanus (Tiny Bog Rush) 378. 16254 Schoenus sp. G Broad Sheath (K.L. Wilson 2633) 379. 44567 Scholtzia obovata 380. 2609 Sclerolaena eurotioides (Fluffy Bindii) 381. 2612 Sclerolaena eurotioides (Fluffy Bindii) 382. 2628 Sclerolaena uniflora (Two-spined Saltbush) 384. 12276 Senna artemisioides subsp. felifolia				·		
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371. 7595 Scaevola anchusifolia 372. 7606 Scaevola crassifolia (Thick-leaved Fan-flower) 373. 7644 Scaevola spinescens (Currant Bush, Maroon) 374. 7648 Scaevola tomentosa (Raggedleaf Fanflower) 375. 41660 Schenkia australis 376. 8200 Schoenia cassiniana (Schoenia) 377. 1002 Schoenus nanus (Tiny Bog Rush) 378. 16254 Schoenus sp. G Broad Sheath (K.L. Wilson 2633) 379. 44567 Scholtzia obovata 380. 2609 Sclerolaena diacantha (Grey Copperburr) 381. 2612 Sclerolaena eurotioides (Fluffy Bindii) 382. 2628 Sclerolaena uniflora (Two-spined Saltbush) 384. 12276 Senna artemisioides subsp. filifolia 385. 12279 Senna artemisioides subsp. helmsii	369.	2359	Santalum spicatum (Sandalwood, Wilarak)			
372. 7606 Scaevola crassifolia (Thick-leaved Fan-flower) 373. 7644 Scaevola spinescens (Currant Bush, Maroon) 374. 7648 Scaevola tomentosa (Raggedleaf Fanflower) 375. 41660 Schenkia australis 376. 8200 Schoenia cassiniana (Schoenia) 377. 1002 Schoenus nanus (Tiny Bog Rush) 378. 16254 Schoenus sp. G Broad Sheath (K.L. Wilson 2633) 379. 44567 Scholtzia obovata 380. 2609 Sclerolaena diacantha (Grey Copperburr) 381. 2612 Sclerolaena eurotioides (Fluffy Bindii) 382. 2628 Sclerolaena recurvicuspis 383. 2633 Sclerolaena uniflora (Two-spined Saltbush) 384. 12276 Senna artemisioides subsp. felinsii	370.	4706	Sauropus crassifolius			
373. 7644 Scaevola spinescens (Currant Bush, Maroon) 374. 7648 Scaevola tomentosa (Raggedleaf Fanflower) 375. 41660 Schenkia australis 376. 8200 Schoenia cassiniana (Schoenia) 377. 1002 Schoenus nanus (Tiny Bog Rush) 378. 16254 Schoenus sp. G Broad Sheath (K.L. Wilson 2633) 379. 44567 Scholtzia obovata 380. 2609 Sclerolaena diacantha (Grey Copperburr) 381. 2612 Sclerolaena eurotioides (Fluffy Bindii) 382. 2628 Sclerolaena recurvicuspis 383. 2633 Sclerolaena uniflora (Two-spined Saltbush) 384. 12276 Senna artemisioides subsp. filifolia 385. 12279 Senna artemisioides subsp. helmsii						
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375.       41660       Schenkia australis         376.       8200       Schoenia cassiniana (Schoenia)         377.       1002       Schoenus nanus (Tiny Bog Rush)         378.       16254       Schoenus sp. G Broad Sheath (K.L. Wilson 2633)         379.       44567       Scholtzia obovata         380.       2609       Sclerolaena diacantha (Grey Copperburr)         381.       2612       Sclerolaena eurotioides (Fluffy Bindii)         382.       2628       Sclerolaena recurvicuspis         383.       2633       Sclerolaena uniflora (Two-spined Saltbush)         384.       12276       Senna artemisioides subsp. filifolia         385.       12279       Senna artemisioides subsp. helmsii						
376. 8200 Schoenia cassiniana (Schoenia) 377. 1002 Schoenus nanus (Tiny Bog Rush) 378. 16254 Schoenus sp. G Broad Sheath (K.L. Wilson 2633) 379. 44567 Scholtzia obovata 380. 2609 Sclerolaena diacantha (Grey Copperburr) 381. 2612 Sclerolaena eurotioides (Fluffy Bindii) 382. 2628 Sclerolaena recurvicuspis 383. 2633 Sclerolaena uniflora (Two-spined Saltbush) 384. 12276 Senna artemisioides subsp. filifolia 385. 12279 Senna artemisioides subsp. helmsii						
377. 1002 Schoenus nanus (Tiny Bog Rush) 378. 16254 Schoenus sp. G Broad Sheath (K.L. Wilson 2633) 379. 44567 Scholtzia obovata 380. 2609 Sclerolaena diacantha (Grey Copperburr) 381. 2612 Sclerolaena eurotioides (Fluffy Bindii) 382. 2628 Sclerolaena recurvicuspis 383. 2633 Sclerolaena uniflora (Two-spined Saltbush) 384. 12276 Senna artemisioides subsp. filifolia 385. 12279 Senna artemisioides subsp. helmsii						
378. 16254 Schoenus sp. G Broad Sheath (K.L. Wilson 2633) 379. 44567 Scholtzia obovata 380. 2609 Sclerolaena diacantha (Grey Copperburr) 381. 2612 Sclerolaena eurotioides (Fluffy Bindii) 382. 2628 Sclerolaena recurvicuspis 383. 2633 Sclerolaena uniflora (Two-spined Saltbush) 384. 12276 Senna artemisioides subsp. filifolia 385. 12279 Senna artemisioides subsp. helmsii			, ,			
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382. 2628 Sclerolaena recurvicuspis 383. 2633 Sclerolaena uniflora (Two-spined Saltbush) 384. 12276 Senna artemisioides subsp. filifolia 385. 12279 Senna artemisioides subsp. helmsii	380.	2609	Sclerolaena diacantha (Grey Copperburr)			
383. 2633 Sclerolaena uniflora (Two-spined Saltbush) 384. 12276 Senna artemisioides subsp. filifolia 385. 12279 Senna artemisioides subsp. helmsii	381.	2612	Sclerolaena eurotioides (Fluffy Bindii)			
384. 12276 Senna artemisioides subsp. filifolia 385. 12279 Senna artemisioides subsp. helmsii			·			
385. 12279 Senna artemisioides subsp. helmsii						
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	385.	12279	осниа аненныющег эшэгр. неннізн	Department	of Biodiversity	MESTERN







	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
386.	12305	Senna glutinosa subsp. chatelainiana			
387.	12308	Senna glutinosa subsp. x luerssenii			
388.		Senna pleurocarpa			
389.		Senna pleurocarpa var. pleurocarpa			
390.		Senna sp. Meekatharra (E. Bailey 1-26)			
391.		Seringia hermanniifolia (Crinkle-leaved firebush)			
392. 393.		Setaria dielsii (Diels' Pigeon Grass)			
393.		Sida calyxhymenia (Tall Sida) Sida kingii			
395.		Silene gallica var. gallica	Υ		
396.		Sisymbrium erysimoides (Smooth Mustard)	Y		
397.		Solanum hesperium	·		
398.		Solanum lasiophyllum (Flannel Bush, Mindjulu)			
399.	7023	Solanum nummularium (Money-leaved Solanum)			
400.	7025	Solanum oldfieldii			
401.	7026	Solanum orbiculatum (Wild Tomato)			
402.	11241	Solanum orbiculatum subsp. orbiculatum (Round-leaved Solanum)			
403.	8231	Sonchus oleraceus (Common Sowthistle)	Υ		
404.	625	Spinifex longifolius (Beach Spinifex)			
405.	44523	Spongophloea tissotii			
406.		Sporobolus virginicus (Marine Couch)			
407.		Spyridia filamentosa			
408.		Stackhousia sp. Mid west coastal (D. & B. Bellairs 6561)			
409.		Stenanthemum complicatum			
410.		Stenopetalum pedicellare			
411.		Stylobasium spathulatum (Pebble Bush)			
412.		Surreya diandra			
413. 414.		Swainsona canescens (Grey Swainsona) Swainsona kingii			
415.		Swainsona pterostylis			
416.		Swainsona sp. Shark Bay (M.E. Trudgen 7588)			
417.		Synaptantha tillaeacea			
418.		Tamarix aphylla (Athel Tree)	Υ		
419.	31616	Tecticornia auriculata			
420.	33236	Tecticornia halocnemoides (Shrubby Samphire)			
421.	33319	Tecticornia indica subsp. bidens			
422.	31674	Tecticornia peltata			
423.	33220	Tecticornia pterygosperma subsp. denticulata			
424.		Tetragonia diptera			
425.		Threlkeldia diffusa (Coast Bonefruit)			
426.		Thryptomene baeckeacea			
427.		Thryptomene dampieri			
428. 429.		Thysanotus arenarius Thysanotus autimbriatus			
429.		Thysanotus exfimbriatus Thysanotus manglesianus (Fringed Lily)			
430.		Thysanotus patersonii			
431.		Thysanotus patersonii Thysanotus speckii			
433.		Tortula atrovirens			
434.		Trachymene elachocarpa			
435.		Tribulus forrestii			
436.	12652	Trichanthodium skirrophorum			
437.	6727	Trichodesma zeylanicum (Camel Bush, Kumbalin)			
438.	1361	Tricoryne elatior (Yellow Autumn Lily)			
439.		Tricoryne sp. Mullewa (G.J. Keighery 12080)			
440.		Triglochin calcitrapa			
441.		Triodia danthonioides			
442.		Triraphis mollis (Needle Grass)			
443.		Ulva flexuosa			
444.		Ulvella viridis	.,		Y
445. 446		Urospermum picroides (False Hawkbit) Vincetovicum lineare	Y		
446.		Vincetoxicum lineare			
117		Vittadinia carvicularis var carvicularis			
447. 448.	11387	Vittadinia cervicularis var. cervicularis  Wahlenbergia gracilenta (Annual Bluebell)			
448.	11387 7386	Wahlenbergia gracilenta (Annual Bluebell)			
448. 449.	11387 7386 8279	Wahlenbergia gracilenta (Annual Bluebell) Waitzia corymbosa			
448.	11387 7386 8279 13328	Wahlenbergia gracilenta (Annual Bluebell) Waitzia corymbosa Waitzia nitida			
448. 449. 450.	11387 7386 8279 13328 8281	Wahlenbergia gracilenta (Annual Bluebell) Waitzia corymbosa			







Name ID Species Name

Naturalised

Conservation Code <sup>1</sup>Endemic To Query Area

Conservation Codes

- Raire of likely to become extinct

- Raire of likely to become extinct

X - Presumed extinct

IA - Protected under international agreement

S - Other specially protected fauna

- Priority

2 - Priority

3 - Priority

4 - Priority

5 - Priority

5 - Priority

5

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







## **NatureMap Species Report**

#### Created By Colleen McDonald on 17/07/2019

Kingdom Animalia

**Current Names Only** Yes

Core Datasets Only Yes

Method 'By Circle'

Centre 113° 32' 58" E,25° 54' 39" S

Buffer 20km

Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	296	2873
Other specially protected fauna	1	2
Priority 1	1	7
Priority 3	1	1
Priority 4	3	65
Protected under international agreement	20	244
Rare or likely to become extinct	13	120
TOTAL	335	3312

	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Que Area
Rare or likely	y to bed	come extinct			
1.		Bettongia penicillata subsp. ogilbyi (Woylie, Brush-tailed Bettong)		Т	
2.	33999	Calamanthus campestris subsp. hartogi (Dirk Hartog Island rufous fieldwren, Rufous			
		Fieldwren (Dirk Hartog Is))		Т	
3.	24784	Calidris ferruginea (Curlew Sandpiper)		Т	
4.	24790	Calidris tenuirostris (Great Knot)		Т	
5.	25335	Caretta caretta (Loggerhead Turtle)		Т	
6.	25575	Charadrius leschenaultii (Greater Sand Plover)		Т	
7.	25576	Charadrius mongolus (Lesser Sand Plover)		T	
8.	25336	Chelonia mydas (Green Turtle)		T	
9.	24092	Dasyurus geoffroii (Chuditch, Western Quoll)		Т	
10.	25107	Egernia stokesii subsp. badia (Western Spiny-tailed Skink, Gidgee Skink)		T	
11.	24557	Leipoa ocellata (Malleefowl)		T	
12.	24168	Macrotis lagotis (Bilby, Dalgyte, Ninu)		Т	
13.	24798	Numenius madagascariensis (Eastern Curlew)		T	
Protected un	nder inte	ernational agreement			
14.	41323	Actitis hypoleucos (Common Sandpiper)		IA	
15.	25736	Arenaria interpres (Ruddy Turnstone)		IA	
16.	24779	Calidris acuminata (Sharp-tailed Sandpiper)		IA	
17.	24780	Calidris alba (Sanderling)		IA	
18.	25738	Calidris canutus (Red Knot, knot)		IA	
19.	24788	Calidris ruficollis (Red-necked Stint)		IA	
20.	48587	Hydroprogne caspia (Caspian Tern)		IA	
21.	30932	Limosa lapponica (Bar-tailed Godwit)		IA	
22.	25741	Limosa limosa (Black-tailed Godwit)		IA	
23.	25742	Numenius phaeopus (Whimbrel)		IA	
24.	24497	Oceanites oceanicus (Wilson's Storm-petrel)		IA	
25.	41347	Onychoprion anaethetus (Bridled Tern)		IA	
26.	48591	Pandion cristatus (Osprey, Eastern Osprey)		IA	
27.	24383	Pluvialis squatarola (Grey Plover)		IA	
28.	25642	Sterna hirundo (Common Tern)		IA	
29.	48597	Thalasseus bergii (Crested Tern)		IA	
30.	24806	Tringa glareola (Wood Sandpiper)		IA	
31.	24808	Tringa nebularia (Common Greenshank, greenshank)		IA	
32.	24809	Tringa stagnatilis (Marsh Sandpiper, little greenshank)		IA	
33.	41351	Xenus cinereus (Terek Sandpiper)		IA	

Other specially protected fauna

34. 24084 Dugong dugon (Dugong)

**Priority 1** 







	Name ID	Species Name	Naturalised	Conservation Code	Endemic To Que
35.	47673	Aspidites ramsayi subsp. (southwest subpop.) (Woma (southwest subpop.))		P1	
riority 3					
36.	25006	Pletholax gracilis subsp. edelensis (Keeled Legless Lizard (Shark Bay))		P3	
riority 4					
37.		Amytornis textilis (Thick-billed Grasswren)		P4	
38.	24541	Amytornis textilis subsp. textilis (Western Grasswren, Thick-billed Grasswren (western))		P4	
39.	24803	Tringa brevipes (Grey-tailed Tattler)		P4	
on-conser					
40.	valion la	??			
41.		Abudefduf bengalensis			
42.		Abudefduf sp.			
43.		Acanthagenys rufogularis (Spiny-cheeked Honeyeater)			
44.		Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)			
45. 46.		Acanthiza iredalei (Samphire Thornbill, Slender-billed Thornbill)  Acanthiza iredalei subsp. iredalei (Samphire Thornbill, Slender-billed Thornbill)			
47.		Acanthiza uropygialis (Chestnut-rumped Thornbill)			
48.	25535	Accipiter cirrocephalus (Collared Sparrowhawk)			
49.	25536	Accipiter fasciatus (Brown Goshawk)			
50.		Acrocephalus australis (Australian Reed Warbler)			
51. 52.		Aipysurus pooleorum (Shark Bay Seasnake)			
52. 53.	∠5357	Aipysurus tenuis (Brown-lined Seasnake) Amblygobius phalaena			
54.		Amniataba caudavittata			
55.	30833	Amphibolurus longirostris (Long-nosed Dragon)			
56.		Aname mainae			
57.		Anas gracilis (Grey Teal)			
58. 59.	47414	Anhinga novaehollandiae (Australasian Darter)  Apogon rueppellii			
60.		Apogon sp.			
61.		Apogon victoriae			
62.	24285	Aquila audax (Wedge-tailed Eagle)			
63.		Araneus eburneiventris			
64.		Ardea modesta (great egret, white egret)			
65. 66.		Ardea pacifica (White-necked Heron)  Ardeotis australis (Australian Bustard)			
67.	24010	Argiope protensa			
68.	25566	Artamus cinereus (Black-faced Woodswallow)			
69.	25567	Artamus leucorynchus (White-breasted Woodswallow)			
70.		Asadipus phaleratus			
71.	25236	Aspidites ramsayi (Woma)			
72. 73.		Assiculus punctatus Austrammo harveyi			
74.		Backobourkia collina			
75.	42380	Brachyurophis fasciolatus subsp. fasciolatus (Narrow-banded Shovel-nosed Snake)			
76.		Butorides striata (Striated Heron, Mangrove Heron)			
77.		Cacatua sanguinea (Little Corella)			
78. 79.		Cacomantis pallidus (Pallid Cuckoo)			
79. 80.		Calamanthus campestris (Rufous Fieldwren) Calyptorhynchus banksii (Red-tailed Black-Cockatoo)			
81.		Carcharhinus brevipinna			
82.		Carcharhinus sp.			
83.		Centrogenys vaigiensis			
84.	0.4==	Cercophonius granulosus			
85. 86.		Certhionyx variegatus (Pied Honeyeater)  Charadrius ruficapillus (Red-capped Plover)			
86.		Charadrius runcapillus (Red-capped Plover)  Chelodina steindachneri (Flat-shelled Turtle)			
88.		Cheramoeca leucosterna (White-backed Swallow)			
89.		Chiloscyllium punctatum			
90.		Choerodon rubescens			
91.		Chroiseanhalus payrahallandiaa			
92. 93.	24280	Chroicocephalus novaehollandiae Circus assimilis (Spotted Harrier)			
93. 94.	24209	Clubiona laudabilis			
95.		Clynotis albobarbatus			
96.	25675	Colluricincla harmonica (Grey Shrike-thrush)			
97.		Colurodontis paxmani			
		Congrogadus subducens			
98. 99.		Coracina novaehollandiae (Black-faced Cuckoo-shrike)			



	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
100.		Cormocephalus aurantiipes			
101.	24416	Corvus bennetti (Little Crow)			
102.	25592	Corvus coronoides (Australian Raven)			
103.	25593	Corvus orru (Torresian Crow)			
104.	24420	Cracticus nigrogularis (Pied Butcherbird)			
105.	25596	Cracticus torquatus (Grey Butcherbird)			
106.		Craterocephalus pauciradiatus			
107.		Cristiceps sp.			
108.		Cryptoerithus harveyi			
109.		Cryptoerithus occultus			
110.		Cryptoerithus quobba			
111.		Ctenophorus maculatus (Spotted Military Dragon)			
112.		Ctenophorus maculatus subsp. maculatus (Spotted Military Dragon)			
113.		Ctenophorus reticulatus (Western Netted Dragon)			
114.		Ctenophorus scutulatus (Lozenge-marked Dragon)			
115.		Ctenotus fallens			
116.		Ctenotus schomburgkii			
117.	25087	Cyclodomorphus celatus (Western Slender Blue-tongue)			
118. 119.		Cymbacephalus nematophthalmus			
120.		Cynoglossus maculipinnis Dactylopus dactylopus			
120.	24007	Delma butleri			
121.		Delma nasuta			
123.		Demansia calodera (Black-necked Whipsnake)			
124.		Dicaeum hirundinaceum (Mistletoebird)			
125.	20001	Dingosa serrata			
126.	25231	Diplodactylus klugei			
127.		Diplodactylus ornatus			
128.		Diplodactylus pulcher			
129.		Dromaius novaehollandiae (Emu)			
130.		Drombus lepidothorax			
131.	24650	Drymodes brunneopygia (Southern Scrub-robin)			
132.		Egretta novaehollandiae			
133.		Elanus axillaris			
134.		Eolophus roseicapillus			
135.		Epinephelus coioides			
136.	24567	Epthianura albifrons (White-fronted Chat)			
137.	24568	Epthianura aurifrons (Orange Chat)			
138.		Ethmostigmus curtipes			
139.		Euristhmus microceps			
140.		Eviota sp.			
141.	25621	Falco berigora (Brown Falcon)			
142.		Falco cenchroides (Australian Kestrel, Nankeen Kestrel)			
143.		Falco cenchroides subsp. cenchroides (Australian Kestrel, Nankeen Kestrel)			
144.	25623	Falco longipennis (Australian Hobby)			
145.		Favonigobius lateralis			
146.		Favonigobius sp.			
147.	24041	Felis catus (Cat)	Υ		
148.		Festucalex scalaris			
149.	0570-	Festucalex sp.			
150.		Fulica atra (Eurasian Coot)			
151. 152		Gavicalis virescens (Singing Honeyeater)			
152. 153.		Gehyra variegata  Georgelia cureata (Diamond Dove)			
153. 154.		Geopelia cuneata (Diamond Dove) Grallina cyanoleuca (Magpie-lark)			
154.		Haematopus fuliginosus (Sooty Oystercatcher)			
156.		Haematopus longirostris (Pied Oystercatcher)			
157.		Haliaeetus leucogaster (White-bellied Sea-Eagle)			
158.	2 .200	Halichoeres brownfieldi			
159.		Halichoeres sp.			
160.		Heteroclinus sp.			
161.	24961	Heteronotia binoei (Bynoe's Gecko)			
162.		Heteropoda hermitis			
163.		Heteropoda kalbarri			
164.	47965	Hieraaetus morphnoides (Little Eagle)			
165.		Himantopus himantopus (Black-winged Stilt)			
166.		Hippocampus angustus			
167.	24491	Hirundo neoxena (Welcome Swallow)			
168.		Hoggicosa bicolor			
169.		Hoggicosa castanea			
			Departmen	of Biodiversity,	WESTERN







	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
170.		Holasteron humphreysi			
171.		Holconia nigrigularis			
172.		Hydrophis elegans (Elegant Seasnake, Bar-bellied Seasnake)			
173.		Hydrophis major (Olive-headed seasnake, greater seasnake)			
174.	43384	Hydrophis platurus (Yellow-bellied Seasnake)			
175.		Hypopterus macropterus			
176.		Isometroides vescus			
177. 178.		Labracinus lineatus Lactoria concatenatus			
178.		Lampona quinqueplagiata			
180.		Lamponina elongata			
181.		Lamponina scutata			
182.	25638	Larus pacificus (Pacific Gull)			
183.	24512	Larus pacificus subsp. georgii (Pacific Gull)			
184.		Latrodectus hasseltii			
185.	25129	Lerista connivens			
186.	25133	Lerista elegans			
187.	25148	Lerista lineopunctulata			
188.		Lerista macropisthopus			
189.		Lerista macropisthopus subsp. fusciceps			
190.		Lerista micra			
191.		Lerista planiventralis			
192. 193.		Lerista planiventralis subsp. decora Lerista praepedita			
194.		Lerista praepeulia Lerista uniduo (Spotted Broad-blazed Slider, skink)			
195.		Lerista varia			
196.		Lethrinus laticaudis			
197.	25005	Lialis burtonis			
198.		Lissocampus fatiloquus			
199.	42414	Lucasium alboguttatum			
200.		Lutjanus fulviflamma			
201.		Mainosa longipes			
202.		Malurus lamberti (Variegated Fairy-wren)			
203.		Malurus lamberti subsp. assimilis (Variegated Fairy-wren)			
204. 205.		Malurus leucopterus (White-winged Fairy-wren)  Malurus leucopterus subsp. leuconotus (White-winged Fairy-wren)			
206.		Malurus splendens (Splendid Fairy-wren)			
207.		Manorina flavigula (Yellow-throated Miner)			
208.		Melanodryas cucullata (Hooded Robin)			
209.	24736	Melopsittacus undulatus (Budgerigar)			
210.		Mene maculata			
211.	25184	Menetia greyii			
212.	25186	Menetia surda subsp. cresswelli			
213.		Microcanthus strigatus			
214. 215.	255.42	Microcarbo melanoleucos			
216.		Milvus migrans (Black Kite) Moloch horridus (Thorny Devil)			
217.	24004	Monacanthus chinensis			
218.	25191	Morethia lineoocellata			
219.		Mugil cephalus			
220.		Mugil sp.			
221.	24223	Mus musculus (House Mouse)	Υ		
222.		Myandra bicincta			
223.		Myiagra ruficollis subsp. mimikae (Broad-billed Flycatcher)			
224.	24739	Neophema petrophila (Rock Parrot)			
225. 226.	25407	Nephila edulis			
227.		Nephrurus levis Nephrurus levis subsp. levis			
228.		Nephrurus levis subsp. occidentalis			
229.		Nicodamus mainae			
230.		Nomindra leeuweni			
231.		Notograptus sp.			
232.	24224	Notomys alexis (Spinifex Hopping-mouse)			
233.		Notsodipus meedo			
234.		Nycticorax caledonicus (Rufous Night Heron)			
235.		Nyctophilus geoffroyi (Lesser Long-eared Bat)			
236. 237.		Nymphicus hollandicus (Cockatiel) Ocyphaps lophotes (Crested Pigeon)			
237.	2 <del>44</del> 07	Ocypnaps reprietes (Crested Pigeon)  Omobranchus retundiceps			
239.		Omobranchus sp.			
			Department of	Biodiversity,	MESTERN

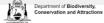






241. 2410 Ownskip spulsarials (Consent February) 242. 2411 Ownskip spulsarials (Consent February) 243. 2411 Ownskip spulsarials (Consent February) 244. 2411 Ownskip spulsarials (Consent February) 244. 2411 Percentage of Spulsarials (Consent February) 245. 2411 Percentage of Spulsarials (Consent February) 246. 2412 Percentage of Spulsarials (Consent February) 247. Percentage of Spulsarials (Consent February) 248. 2412 Percentage of Spulsarials (Consent February) 248. 2412 Percentage of Spulsarials (Consent February) 249. Percentage of Spulsarials (Consent February) 240. 2412 Percentage of Spulsarials (Consent February) 2412 Percentage of Spulsarials (Consent February) 2413 Percentage of Spulsarials (Consent February) 2414 Percentage of Spulsarials (Consent February) 2415 Percentage of Spulsarials (Consent February) 2416 Percentage of Spulsarials (Consent February) 2417 Percentage of Spulsarials (Consent February) 2417 Percentage of Spulsarials (Consent February) 2418 Percentage of Spulsarials (Consent February) 2419 Percentage of Spulsarials (Consent February) 2419 Percentage of Spulsarials (Consent February) 2410 Percentage of Spulsarials (Consent February) 2411 Percentage of Spulsarials (Consent February) 2411 Percentage of Spulsarials (Consent February) 2412 Percentage of Spulsarials (Consent February) 2413 Percentage of Spulsarials (Consent February) 2414 Percentage of Spulsarials (Consent February) 2414 Percentage of Spulsarials (Consent February) 2415 Percentage of Spulsarials (Consent February) 2416 Percentage of Spulsarials (Consent February) 2416 Percentage of Spulsarials (Consent February) 2417 Percentage of Spulsarials (Consent February) 2418 Percentage of Spulsarials (Consent February) 2419 Percentage of S		Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
241.   2011   Oriente grantents solary partners (Centre Debild)   Y	240.		Opisthoncus devexus			
24.0.   20.05   Organization control (Patilitan Winder)	241.	24618	Oreoica gutturalis (Crested Bellbird)			
244.   2609   Perbulyanghan (information (Pallocus Winders)	242.	34012	Oreoica gutturalis subsp. pallescens (Crested Bellbird, central)			
446. Paraseterocognic vergas  447. Polity Completions and biologic  448. 2682 Parabolises are subsidiers  449. Polity Completions and biologic  440. Polity Completions and biologic  450. Polity Completions and Parabolish  450. 2689 Polity Completions and Parabolish  450. 2689 Polity Completions and Parabolish  450. Polity Completions and Parabolish  450. 2689 Polity Complet	243.	24085	Oryctolagus cuniculus (Rabbit)	Υ		
Paraphic promise connection	244.	25680	Pachycephala rufiventris (Rufous Whistler)			
244.   Frampolesson ablables   Parkinson State (Primary Parkinson)						
248.   23/20   Printings carbon (Streets Printings)			· ·			
Pelatis spanishmental  261. 20168 Pelatense conspolational ulusarians Pelatens  262. 26168 Pelatense conspolational ulusarians Pelatens  263. 48000 Personale common common Pelatens  264. 48000 Personale common gratum (Tem Butter)  265. 24100 Pelatense ground sele (Felaty Materia)  266. Pelatense production (Felat Common Pelatens)  267. 24107 Pelatense production (Felat Common Pelatense)  268. 26900 Pelatense substances (Felat Select Common Pelatense)  269. 24400 Pelatense substances (Felat Select Common Pelatense)  269. 24400 Pelatense substances (Felat Select Common Pelatense)  260. 24400 Pelatense substances (Felat Select Common Pelatense)  261. 2620 Pelatense substances (Felat Select Common Pelatense)  262. 2630 Pelatense substances (Felat Select Selec						
2910.   Pelistris southeratus		25682				
251.   24648   Policanous conspicialistas (Autralian Parlacian)						
202.   Permission in elementaria i		0.40.40				
25.5   45000   Petrochelokyn erlor (Family Martin)		24648	, , ,			
25.4.         48091 Perioning-protomoly (Plos-Ingention)           25.5.         2580 Perioning-protomoly (Plos-Ingention)           25.7.         2587 Phalacoccopy wints (Plas Study Companie)           25.8.         2580 Phalacoccopy wints (Plas Occurrent)           25.9.         2580 Phalacoccopy wints (Plas Occurrent)           25.9.         2580 Phalacoccopy wints (Plas Occurrent)           26.1.         Phospophalace indenderborses           26.2.         Psychotrinchia multimitale           26.3.         2580 Phalacoccopy and information (Plant Research Organ)           26.4.         22610 Phalacoccopy stage (Plant Research Organ)           26.5.         24813 Portametorus supervisionas subgra, involve (Plant Research Organ)           26.6.         24825 Portametorus supervisionas subgra, involve (Plant Research Organ)           26.7.         24835 Portametorus supervisionas subgra, involve (Plant Portamet Research Organ)           26.8.         24810 Portametorus supervisionas subgra, involve (Plant Portamet Research Organ)           26.9.         24810 Portametorus supervisionas subgra, involve (Plant Portamet Research Organ)           27.0.         22811 Portametorus supervisionas subgra, involve (Plant Portamet Research Organ)           28.1.         24822 Portametorus variagensis (Sandy Inhard Mouse)           29.2.         24822 Portametorus variagensis (Sandy Inhard Mouse)     <		49060				
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296.       25267       Simoselaps littoralis (West Coast Banded Snake)         297.       Siphamia cuneiceps         298.       24109       Sminthopsis dolichura (Little long-tailed Dunnart)         299.       Spinasteron peron         300.       Spinasteron westi         301.       48594       Sternula nereis (Fairy Tern)         302.       Stigmatopora nigra         303.       25590       Streptopelia senegalensis (Laughing Turtle-Dove)       Y         304.       24936       Strophurus michaelseni         305.       24946       Strophurus strophurus         306.       Suggrundus sp.         307.       Synanceia horrida         308.       Syngnathoides biaculeatus	294.		-			
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298.       24109       Sminthopsis dolichura (Little long-tailed Dunnart)         299.       Spinasteron peron         300.       Spinasteron westi         301.       48594       Sternula nereis (Fairy Tern)         302.       Stigmatopora nigra         303.       25590       Streptopelia senegalensis (Laughing Turtle-Dove)       Y         304.       24936       Strophurus michaelseni         305.       24946       Strophurus strophurus         306.       Suggrundus sp.         307.       Synanceia horrida         308.       Syngnathoides biaculeatus	296.	25267	Simoselaps littoralis (West Coast Banded Snake)			
299. Spinasteron peron 300. Spinasteron westi 301. 48594 Sternula nereis (Fairy Tern) 302. Stigmatopora nigra 303. 25590 Streptopelia senegalensis (Laughing Turtle-Dove) Y 304. 24936 Strophurus michaelseni 305. 24946 Strophurus strophurus 306. Suggrundus sp. 307. Synanceia horrida 308. Syngnathoides biaculeatus	297.		Siphamia cuneiceps			
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301.       48594       Sternula nereis (Fairy Tern)         302.       Stigmatopora nigra         303.       25590       Streptopelia senegalensis (Laughing Turtle-Dove)       Y         304.       24936       Strophurus michaelseni         305.       24946       Strophurus strophurus         306.       Suggrundus sp.         307.       Synanceia horrida         308.       Syngnathoides biaculeatus	299.		Spinasteron peron			
302. Stigmatopora nigra 303. 25590 Streptopelia senegalensis (Laughing Turtle-Dove) Y 304. 24936 Strophurus michaelseni 305. 24946 Strophurus strophurus 306. Suggrundus sp. 307. Synanceia horrida 308. Syngnathoides biaculeatus						
303. 25590 Streptopelia senegalensis (Laughing Turtle-Dove)  304. 24936 Strophurus michaelseni  305. 24946 Strophurus strophurus  306. Suggrundus sp.  307. Synanceia horrida  308. Syngnathoides biaculeatus		48594				
304. 24936 Strophurus michaelseni 305. 24946 Strophurus strophurus 306. Suggrundus sp. 307. Synanceia horrida 308. Syngnathoides biaculeatus						
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NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions and the Western Australian Museur







	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
309.	25705	Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)			
310.	24207	Tachyglossus aculeatus (Short-beaked Echidna)			
311.	24331	Tadorna tadornoides (Australian Shelduck, Mountain Duck)			
312.	30870	Taeniopygia guttata (Zebra Finch)			
313.	30871	Taeniopygia guttata subsp. castanotis (Zebra Finch)			
314.	25203	Tiliqua occipitalis (Western Bluetongue)			
315.	25519	Tiliqua rugosa			
316.	25206	Tiliqua rugosa subsp. palarra			
317.	25549	Todiramphus sanctus (Sacred Kingfisher)			
318.		Torquigener pleurogramma			
319.		Torquigener tuberculiferus			
320.		Torquigener whitleyi			
321.		Trichocyclus nigropunctatus			
322.	30954	Tursiops aduncus (Indo-Pacific Bottlenose Dolphin)			
323.	24069	Tursiops truncatus (Bottlenose Dolphin)			
324.		Tylosurus gavialoides			
325.		Upeneus tragula			
326.		Urodacus hartmeyeri			
327.		Urodacus mckenziei			
328.	24386	Vanellus tricolor (Banded Lapwing)			
329.	25211	Varanus caudolineatus			
330.	25212	Varanus eremius (Pygmy Desert Monitor)			
331.	25218	Varanus gouldii (Bungarra or Sand Monitor)			
332.		Wydundra kennedy			
333.		Yongeichthys nebulosus			
334.	25765	Zosterops lateralis (Grey-breasted White-eye, Silvereye)			
335.	24857	Zosterops luteus (Yellow White-eye)			





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



# **APPENDIX B**

Flora Species List

Family	Species
Acanthaceae	?Acanthaceae sp.
	? Ptilotus divaricatus
Amaranthaceae	Ptilotus obovatus
	Acanthocarpus aff. rupestris
Asparagaceae	Thysanotus ? patersonii
	?*Urospermum picroides
	Gnephosis tenuissima *Hypochaeris glabra
Asteraceae	7.
	Olearia ?occidentissima
	Pembertonia latisquamea
Б.,	*Sonchus oleraceus
Boraginaceae	Halgania littoralis
Brassicaceae	?*Sisymbrium erysimoides
	Atriplex paludosa
	Enchylaena tomentosa
Chenopodiaceae	Maireana trichoptera
Chenopodiaceae	Rhagodia latifolia
	Salsola australis
	Threlkeldia diffusa
Colchicaceae	Wurmbea inframediana
0 1 1	Duperreya commixta
Convolvulaceae	Duperreya sericea
	Euphorbia boophthona
Euphorbiaceae	Euphorbia sharkoensis
	Acacia galeata
	Acacia ligulata
	·
Fabaceae	Acacia tetragonophylla
	Chorizema racemosum
	Indigofera georgei
	Senna glutinosa subsp. ×luerssenii
Geraniaceae	?Erodium sp.
	Goodenia sp.
Goodeniaceae	Goodenia berardiana
Goodomaccac	Scaevola spinescens
	Scaevola tomentosa
Hemerocallidaceae	Dianella revoluta
Juncaginaceae	Triglochin calcitrapa
	Androcalva gaudichaudii
Mak	Hannafordia quadrivalvis
Malvaceae	Hibiscus sturtii var. truncatus
	Sida calyxhymenia
	Melaleuca cardiophylla
Myrtaceae	Melaleuca eulobata
,	Thryptomene dampieri
	?Eulalia aurea
Poaceae	Austrostipa ?crinita
. 545546	Triodia plurinervata
Rhamnaceae	
	Stenanthemum complicatum
Rubiaceae	Opercularia spermacocea
Santalaceae	Exocarpos aphyllus
Sapindaceae	Alectryon oleifolius
Scrophulariaceae	Eremophila glabra
	Anthocercis littorea
	1×1 vaium foraciacimum
Solanaceae	*Lycium ferocissimum
Solanaceae	Solanum lasiophyllum
Solanaceae	·
Solanaceae Stylidiaceae	Solanum lasiophyllum
	Solanum lasiophyllum Solanum orbiculatum subsp. orbiculatum





# **APPENDIX C**

Flora Site Sheet

Denham Detailed Flora and Vegetation Survey SYQ01 MGA 49J Project Name

Site: 755475 **mE** 7132099 **mN** 

Described by: CM, CK Date: 2019-07-24 Quadrat 30x30 Type: Soil Colour: Brown,Orange

Soil Type: Sand Habitat: Dune

Vegetation:

Mid Open Shrubland of Acacia ligulata and Exocarpos aphyllus over a Low Open Shrubland of Chorizema racemosum , Melaleuca eulobata and Thryptomene dampieri over a Low Open Hummock Grassland of *Triodia plurinervata* 



Veg Condition: Excellent

Fire Age: 1-5 years Fire Evidence: Burnt Vegetation

Notes

0 % 0 % Rock Type Rock Cover: Outcropping: Total PFC: 80 % Leaf Litter: 0 % Bareground: 20 % 1 % Logs:

Disturbance Type: Fire Evidence

0. 20.20 2.01			
Name	Height (cm)	Cover	Notes
?Erodium sp.	50	0.1	Sterile
?Eulalia aurea	50	0.1	Burnt previously
?Ptilotus divaricatus	30	0.1	
?*Urospermum picroides	5	0.1	
Acacia ligulata	120	10	
Acanthocarpus aff. rupestris	20	0.1	P2
Dianella revoluta	50	0.1	
Duperreya commixta	30	0.1	
Euphorbia boophthona	10	0.1	
Exocarpos aphyllus	100	1	
Goodenia berardiana	50	0.1	
*Lycium ferocissimum	50	1	
Melaleuca cardiophylla	40	2	
Olearia ?occidentissima	40	0.1	Potential P2 Several plants dead, old flowers
Pembertonia latisquamea	10	0.1	
Pimelea microcephala subsp. microcephala	70	2	
Rhagodia latifolia	30	0.1	
Roepera ?fruticulosa	10	0.1	
Scaevola tomentosa	40	0.1	
Solanum lasiophyllum	10	0.1	
Solanum orbiculatum subsp. orbiculatum	20	0.5	
Stylobasium spathulatum	60	0.1	
Threlkeldia diffusa	40	0.1	
Thysanotus ?patersonii	30	0.1	
Triodia plurinervata	20	60	P3
Wurmbea inframediana	50	0.1	

Denham Detailed Flora and Vegetation Survey SYQ02 MGA 49J Project Name

Site: SYQ02 755388 **mE** 7132013 **mN** 

Described by: CM, CK Date: 2019-07-24 Quadrat 30x30 Туре:

Soil Colour: Brown,Red Soil Type: Sand Habitat: Dune

Vegetation:

Mid Open Shrubland of Acacia ligulata and Exocarpos aphyllus over a Low Open Shrubland of Chorizema racemosum , Melaleuca eulobata and Thryptomene dampieri over a Low Open Hummock Grassland of Triodia plurinervata



Veg Condition: Excellent

Fire Age: 1-5 years Fire Evidence:

Notes

Rock Type Total PFC: 0 % Outcropping: Rock Cover: 0 % 55 % 0 % Bareground: 40 % Leaf Litter: 5 % Logs:

Disturbance Type:

OF LOILS LIST			
Name	Height	Cover	Notes
?Erodium sp.	50	0.1	
?Eulalia aurea	20	0.1	
?Ptilotus divaricatus	40	0.1	
?*Urospermum picroides	50	0.1	
Acacia ligulata	100	5	
Acacia tetragonophylla	70	1	
Acanthocarpus aff. rupestris	30	0.1	P2
Alectryon oleifolius	150	0.1	
Androcalva gaudichaudii	30	0.1	
Austrostipa ?crinita	50	0.1	
Chorizema racemosum	20	1	
Dianella revoluta	30	0.1	
Duperreya commixta	60	0.1	
Duperreya sericea	40	0.1	
Eremophila glabra	70	0.1	
Euphorbia boophthona	10	0.1	
Exocarpos aphyllus	120	1	
Goodenia berardiana	50	0.1	
Hannafordia quadrivalvis	30	0.1	
Hibiscus sturtii var. truncatus	20	0.5	
*Lycium ferocissimum	30	0.1	
Maireana trichoptera	20	0.1	
Melaleuca cardiophylla	50	1	
Olearia ?occidentissima	50	0.1	Potential P2
Pembertonia latisquamea	30	0.5	
Pimelea microcephala subsp. microcephala	70	0.1	
Rhagodia latifolia	50	0.1	
Roepera fruticulosa	30	1	
Scaevola spinescens	50	0.5	
Senna glutinosa subsp. ×luerssenii	50	0.1	
Sida calyxhymenia	30	0.1	
Solanum lasiophyllum	20	0.1	
Solanum orbiculatum subsp. orbiculatum	30	0.1	
Stylobasium spathulatum	50	0.1	
Threlkeldia diffusa	20	0.1	
Thryptomene dampieri	40	5	
Thysanotus ?patersonii	20	0.1	
Triodia plurinervata	20	15	P3

Denham Detailed Flora and Vegetation Survey SYQ03 MGA 49J Project Name

Site: 755197 **mE** 7132028 **mN** 

Described by: CM, CK Date: 2019-07-24 Quadrat 30x30 Туре: Soil Colour: Brown,Orange

Soil Type: Sand Habitat: Dune

Vegetation:

Mid Open Shrubland of Acacia ligulata and Exocarpos aphyllus over a Low Open Shrubland of Chorizema racemosum , Melaleuca eulobata and Thryptomene dampieri over a Low Open Hummock Grassland of Triodia plurinervata



Veg Condition: Excellent

Fire Age: 1-5 years Fire Evidence:

Notes

Rock Type Total PFC: Outcropping: Rock Cover: 0 % 0 % 75 % 22 %

3 % Logs: Leaf Litter: 0 % Bareground:

Disturbance Type: Goat Tracks/Scats

SPECIES LIST			
Name	Height	Cover	Notes
?Erodium sp.	50	0.1	
?Eulalia aurea	40	0.1	
?*Urospermum picroides	50	0.1	
Acacia ligulata	200	10	
Acacia tetragonophylla	50	1	
Acanthocarpus aff. rupestris	10	0.1	P2
Androcalva gaudichaudii	40	0.1	
Chorizema racemosum	40	15	
Dianella revoluta	30	0.1	
Duperreya commixta	40	0.1	
Duperreya sericea	50	0.1	
Enchylaena tomentosa	20	0.1	
Euphorbia boophthona	10	0.1	
Euphorbia sharkoensis	2	0.1	
Exocarpos aphyllus	120	1	
Goodenia berardiana	10	0.1	
Goodenia sp.	0.05	0.1	
Goodenia berardiana	5	0.1	
Halgania littoralis	20	0.1	
Hibiscus sturtii var. truncatus	10	0.1	
*Lycium ferocissimum	40	0.1	
Maireana trichoptera	10	0.1	
Melaleuca cardiophylla	50	0.5	
Olearia ?occidentissima	30	0.1	Potential P2
Opercularia spermacocea	30	0.1	
Pembertonia latisquamea	20	0.1	
Pimelea microcephala subsp. microcephala	70	0.2	
Ptilotus obovatus	20	0.1	
Rhagodia latifolia	30	0.1	
Roepera fruticulosa	50	0.1	
Scaevola spinescens	50	1	
Senna glutinosa subsp. ×luerssenii	30	0.1	
Solanum lasiophyllum	40	0.1	
Solanum orbiculatum subsp. orbiculatum	20	0.2	
Stenanthemum complicatum	40	0.1	
Stylobasium spathulatum	40	0.2	
Threlkeldia diffusa	20	0.1	
Thryptomene dampieri	40	3	
Thysanotus ?patersonii	40	0.1	
Triodia plurinervata	30	40	P3
Wurmbea inframediana	50	0.1	

Denham Detailed Flora and Vegetation Survey SYQ04 MGA 49J Project Name

Site: SYQ04 755366 **mE** 7132151 **mN** 

Described by: CM, CK Date: 2019-07-26 Quadrat 30x30 Type: Soil Colour: Brown,Orange

Soil Type: Sand Habitat: Dune

Vegetation:

Mid Open Shrubland of Acacia ligulata and Exocarpos aphyllus over a Low Open Shrubland of Chorizema racemosum , Melaleuca eulobata and Thryptomene dampieri over a Low Open Hummock Grassland of Triodia plurinervata



Veg Condition: Very Good

Fire Age: 1-5 years Fire Evidence:

Notes

Rock Type Total PFC: 0 % Outcropping: Rock Cover: 0 % 5 % Logs: 55 % 0 % Bareground: 40 % Leaf Litter:

Disturbance Type: Rabbit Tracks/Scats

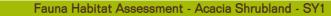
Notes	
P2	
D : :: 1 D0	
Potential P2	
P3	
	P3



# **APPENDIX D**

Fauna Habitat Assessments





 Project:
 3242 Denham Flora & Fauna Survey
 Date:
 2019-07-24
 Quadrat Size:
 50x50
 Latitude:
 -25.905973
 Longitude:
 113.547351



			Ve	getation							Ground C	over			
Vegetation De	oorintion.	Acacia Ope	en Shrubland,	over Melaleuca,	Botanical Province	ce:	Eremaean and Northern	Pebbles (<0.6cm)	0%	Rocks (20-60cm)	0%	Bare Ground	20-50%	Hummock Grass	<2%
vegetation De	escription:	Thryptomen	e, Chorizema	and mixed shrubs	Vegetation Cond	lition:	Very Good	Small Stones (0.6-2cm)	0%	Big Rocks (60cm-2m)	0%	Leaf Litter	2-10%	Tussock Grass	<2%
Stratum		Vegeta	ation Species		Height (m)	% Cover	Description	Stones (2-6cm)	0%	Boulders (>2m)	0%	Logs >10cm	0%	Herbs	<2%
Overstorey			Acacia		1.5	30	Moderate	Small Rocks (6-20cm)	0%	Outcrop	0%	Woody Debris	2-10%	Other:	0
Midstorey		Acacia	and Melaleuca		0.3	30	Moderate		Micro	habitats			Disturb	ance	
Understorey		Anr	nual Herbs		0.1	2	Sparse	Exfoliating Slabs	None	Caves	None	Last Fire	>5 years	Fire Intensity	Unknown
		Soil			Wa	ter		Rock Crevices	None	Tree Hollows	None	Cattle Disturbance	None	Other Disturbance	Goat and
Soil Texture	Sand	Soil Colour	Light orange	Water Prescence	None	Water Dista	nce 500m-2km	Peeling Bark	Rare	Termite Mounds	Rare				Rabbit

#### Fauna Habitat Assessment - Acacia Shrubland, over triodia - SY2

 Project:
 3242 Denham Flora & Fauna Survey
 Date:
 2019-07-24
 Quadrat Size:
 50x50
 Latitude:
 -25.906522
 Longitude:
 113.547902



			Veg	jetation				Ground Cover								
Vegetation D	Docorintion.	Acacia Op	oen Shrubland, c	over Melaleuca,	Botanical Provinc	e:	Eremaean and Northern	Pebbles (<0.6cm)	0%	Rocks (20-60cm)	0%	Bare Ground	10-20%	Hummock Grass	50-90%	
vegetation L	Jescription:	Thryptomene,	Chorizema and	mixed shrubs, ove	bs, over <b>Vegetation Condition:</b> Very Good			Small Stones (0.6-2cm)	0%	Big Rocks (60cm-2m)	0%	Leaf Litter	2-10%	Tussock Grass	0%	
Stratum		Vege	tation Species		Height (m)	% Cover	Description	Stones (2-6cm)	0%	Boulders (>2m)	0%	Logs >10cm	0%	Herbs	<2%	
Overstorey			Acacia		1.5	20	Moderate	Small Rocks (6-20cm)	0%	Outcrop	0%	Woody Debris	2-10%	Other:	0	
Midstorey		Acacia and Melaleuc	a over Triodia and lo	w Shrubs	0.3	80	Dense		Micro	habitats			Disturb	bance		
Understorey		Ar	nnual Herbs		0.1	2	Sparse	Exfoliating Slabs	None	Caves	None	Last Fire	>5 years	Fire Intensity	Unknown	
	Soil				Water			Rock Crevices	None	Tree Hollows	None	Cattle Disturbance	Mild	Other Disturbance	Goat and	
Soil Texture	Sand	Soil Colour	Light orange	Water Prescence	None	Water Distar	nce 500m-2km	Peeling Bark	Rare	Termite Mounds	Rare				Rabbit	





Project: 3242 Denham Flora & Fauna Survey

Date: 2019-07-24

Quadrat Size: 50x50

Latitude: -25.906776

Longitude: 113.549177



			Veç	getation		Ground Cover									
Vegetation De	oorintion.	Acacia Op	en Shrubland, o	over Melaleuca,	Botanical Provinc	e:	Eremaean and Northern	Pebbles (<0.6cm)	0%	Rocks (20-60cm)	0%	Bare Ground	10-20%	Hummock Grass	2-10%
vegetation De	scription:	Thryptomen	ne, Chorizema a	and mixed shrubs	Vegetation Condition: Excellent		Excellent	Small Stones (0.6-2cm)	0%	Big Rocks (60cm-2m)	0%	Leaf Litter	2-10%	Tussock Grass	<2%
Stratum		Veget	tation Species		Height (m)	% Cover	Description	Stones (2-6cm)	0%	Boulders (>2m)	0%	Logs >10cm	0%	Herbs	<2%
Overstorey			Acacia		1.5	20	Moderate	Small Rocks (6-20cm)	0%	Outcrop	0%	Woody Debris	<2%	Other:	0
Midstorey		Acacia	and Melaleuca		0.4	40	Moderate	Microhabitats Disturbance							
Understorey		An	nual Herbs		0.1	2	Sparse	Exfoliating Slabs	None	Caves	None	Last Fire	>5 years	Fire Intensity	Unknown
		Soil			Wat	er		Rock Crevices	None	Tree Hollows	None	Cattle Disturbance	None	Other Disturbance	Goat and
Soil Texture	Sand	Soil Colour	Light orange	Water Prescence	None	Water Dista	ince 500m-2km	Peeling Bark	Rare	Termite Mounds	Rare				Rabbit

#### Fauna Habitat Assessment - Acacia Shrubland, over triodia - SY4

 Project:
 3242 Denham Flora & Fauna Survey
 Date:
 2019-07-24
 Quadrat Size:
 50x50
 Latitude:
 -25.907017
 Longitude:
 113.550402



			Veg	etation				Ground Cover								
Vegetation De	acrintian.	Acacia Ope	n Shrubland, o	ver Melaleuca,	Botanical Provinc	e:	Eremaean and Northern	Pebbles (<0.6cm)	0%	Rocks (20-60cm)	0%	Bare Ground	10-20%	Hummock Grass	50-90%	
vegetation De	escription:	Thryptomene, C	Chorizema and	mixed shrubs, ove	ed shrubs, over <b>Vegetation Condition</b> : Very Good			Small Stones (0.6-2cm)	0%	Big Rocks (60cm-2m)	0%	Leaf Litter	2-10%	Tussock Grass	<2%	
Stratum		Vegeta	tion Species		Height (m)	% Cover	Description	Stones (2-6cm)	0%	Boulders (>2m)	0%	Logs >10cm	0%	Herbs	<2%	
Overstorey		A	Acacia		1.5	20	Moderate	Small Rocks (6-20cm)	0%	Outcrop	0%	Woody Debris	2-10%	Other:	0	
Midstorey		Acacia and Melaleuca	over Triodia and low	Shrubs	0.3	80	Dense		Microh	abitats			Disturb	ance		
Understorey		Anni	ual Herbs		0.1	2	Sparse	Exfoliating Slabs	None	Caves	None	Last Fire	>5 years	Fire Intensity	Unknown	
	Soil				Water			Rock Crevices	None	Tree Hollows	None	Cattle Disturbance	Mild	Other Disturbance	Goat and	
Soil Texture	Sand	Soil Colour	Light orange	Water Prescence	None	Water Dista	ance 500m-2km	Peeling Bark	Rare	Termite Mounds	Rare				Rabbit	





 Project:
 3242 Denham Flora & Fauna Survey
 Date:
 2019-07-24
 Quadrat Size:
 50x50
 Latitude:
 -25.908175
 Longitude:
 113.548239



			ve	getation				Ground Cover								
Vegetation De	andallan.	Acacia Op	en Shrubland,	over Melaleuca,	Botanical Provinc	e:	Eremaean and Northern	Pebbles (<0.6cm)	0%	Rocks (20-60cm)	0%	Bare Ground	10-20%	Hummock Grass	50-90%	
vegetation De	scription:	Thryptomene,	mixed shrubs, ov	er Vegetation Cond	er Vegetation Condition: Ex		Small Stones (0.6-2cm)	0%	Big Rocks (60cm-2m)	0%	Leaf Litter	2-10%	Tussock Grass	<2%		
Stratum		Veget	ation Species		Height (m)	% Cover	Description	Stones (2-6cm)	0%	Boulders (>2m)	0%	Logs >10cm	0%	Herbs	<2%	
Overstorey			Acacia		1.5	10	Sparse	Small Rocks (6-20cm)	0%	Outcrop	0%	Woody Debris	<2%	Other:	0	
Midstorey		Acacia and Melaleuca	over Triodia and Id	w Shrubs	0.3	80	Dense		Mic	crohabitats			Disturb	ance		
Understorey		Ani	nual Herbs		0.1	2	Sparse	Exfoliating Slabs	None	Caves	None	Last Fire	>5 years	Fire Intensity	Unknown	
	Soil				Water			Rock Crevices	None	Tree Hollows	None	Cattle Disturbance	None	Other Disturbance	Goat and	
Soil Texture	Sand	Soil Colour	Light orange	Water Prescence	None	Water Dista	ince 500m-2km	Peeling Bark	Rare	Termite Mounds	Rare				Rabbit	

#### Fauna Habitat Assessment - Acacia Shrubland, over triodia - SY6

 Project:
 3242 Denham Flora & Fauna Survey
 Date:
 2019-07-24
 Quadrat Size:
 50x50
 Latitude:
 -25.908624
 Longitude:
 113.547135



				etation				Ground Cover								
Vegetation D	Dogoription.	Acacia O	pen Shrubland, c	ver Melaleuca,	Botanical Province: /er Vegetation Condition:		Eremaean and Northern	Pebbles (<0.6cm)	0%	Rocks (20-60cm)	0%	Bare Ground	10-20%	Hummock Grass	20-50%	
vegetation L	bescription:	Thryptomene	, Chorizema and	mixed shrubs, ove			Excellent	Small Stones (0.6-2cm)	0%	Big Rocks (60cm-2m)	0%	Leaf Litter	<2%	Tussock Grass	<2%	
Stratum		Veg		Height (m)	% Cover	Description	Stones (2-6cm)	0%	Boulders (>2m)	0%	Logs >10cm	0%	Herbs	<2%		
Overstorey			Acacia		1.5	10	Sparse	Small Rocks (6-20cm)	0%	Outcrop	0%	Woody Debris	2-10%	Other:	0	
Midstorey		Acacia, Melaleuca and P	Pimelea over Triodia an	d low Shrubs	0.3	50	Moderate	Microhabitats				Disturbance				
Understorey		Δ	Annual Herbs		0.1	2	Sparse	Exfoliating Slabs	None	Caves	None	Last Fire	>5 years	Fire Intensity	Unknown	
		Soil			Wat	er		Rock Crevices	None	Tree Hollows	None	Cattle Disturbance	None	Other Disturbance	Goat and	
Soil Texture	Sand	Soil Colour	Light orange	Water Prescence	None	Water Dista	nce 500m-2km	Peeling Bark	Rare	Termite Mounds	Rare				Rabbit	





Date: 2019-07-24 Quadrat Size: 50x50 Project: 3242 Denham Flora & Fauna Survey Latitude: -25.908717



			ve	getation				Ground Cover									
Venetation De	andation.	Acacia Op	en Shrubland,	over Melaleuca,	Botanical Province:		Eremaean and Northern	Pebbles (<0.6cm)	0%	Rocks (20-60cm)	0%	Bare Ground	10-20%	Hummock Grass	20-50%		
Vegetation De	escription:	Thryptomene,	Chorizema and	d mixed shrubs, ov	er Vegetation Cond	ition:	Excellent	Small Stones (0.6-2cm)	0%	Big Rocks (60cm-2m)	0%	Leaf Litter	<2%	Tussock Grass	<2%		
Stratum		Vegetation Species			Height (m)	% Cover	Description	Stones (2-6cm)	0%	Boulders (>2m)	0%	Logs >10cm	0%	Herbs	<2%		
Overstorey			Acacia		1.5	20	Moderate	Small Rocks (6-20cm)	0%	Outcrop	0%	Woody Debris	2-10%	Other:	0		
Midstorey		Acacia and Melaleuca	over Triodia and lo	ow Shrubs	0.3	40	Moderate	Microhabitats				Disturbance					
Understorey	Annual Herbs				0.1	2	Sparse	Exfoliating Slabs	None	Caves	None	Last Fire	>5 years	Fire Intensity	Unknown		
		Soil			Wat	ter		Rock Crevices	None	Tree Hollows	None	Cattle Disturbance	Mild	Other Disturbance	Goat and		
Soil Texture	Sand	Soil Colour	Light orange	Water Prescence	None	Water Dista	ance 500m-2km	Peeling Bark	Rare	Termite Mounds	Rare				Rabbit		

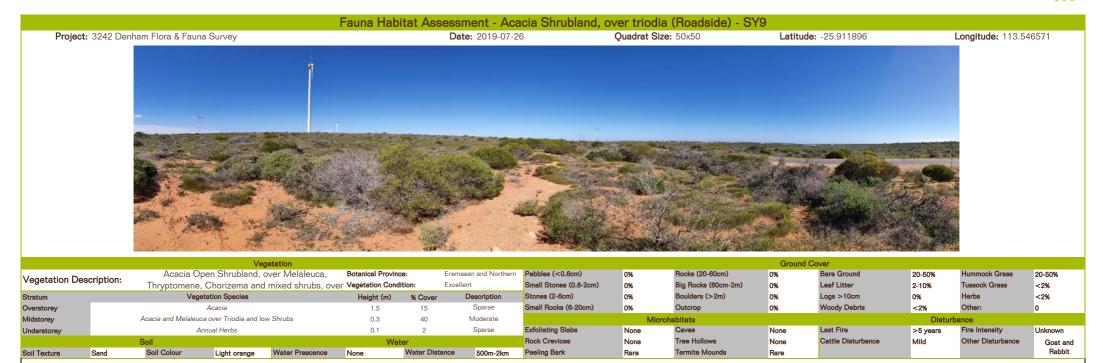
### Fauna Habitat Assessment - Acacia Shrubland, over triodia (Roadside) - SY8

Project: 3242 Denham Flora & Fauna Survey Latitude: -25.909668 Longitude: 113.546765 Date: 2019-07-26 Quadrat Size: 50x50



			Vege	etation				Ground Cover								
Vegetation De	corintian.	Acacia Op	en Shrubland, o	ver Melaleuca,	Botanical Province:		Eremaean and Northern	Pebbles (<0.6cm)	0%	Rocks (20-60cm)	0%	Bare Ground	10-20%	Hummock Grass	20-50%	
vegetation Des	scription:	Thryptomene,	Chorizema and	mixed shrubs, ove	er Vegetation Condition:		Excellent	Small Stones (0.6-2cm)	0%	Big Rocks (60cm-2m)	0%	Leaf Litter	2-10%	Tussock Grass	<2%	
Stratum		Vege	tation Species		Height (m)	% Cover	Description	Stones (2-6cm)	0%	Boulders (>2m)	0%	Logs >10cm	0%	Herbs	<2%	
Overstorey			Acacia		1.5	15	Sparse	Small Rocks (6-20cm)	0%	Outcrop	0%	Woody Debris	2-10%	Other:	0	
Midstorey		Acacia and Melaleuc	a over Triodia and low	Shrubs	0.3	40	Moderate	Microhabitats					Disturbance			
Understorey		Ar	nnual Herbs		0.1	2	Sparse	Exfoliating Slabs	None	Caves	None	Last Fire	>5 years	Fire Intensity	Unknown	
		Soil			Wat	er		Rock Crevices	None	Tree Hollows	None	Cattle Disturbance	Mild	Other Disturbance	Goat and	
Soil Texture	Sand	Soil Colour	Light orange	Water Prescence	None	Water Dista	nce 500m-2km	Peeling Bark	Rare	Termite Mounds	Rare				Rabbit	







# **APPENDIX E**

Flora Statistics

```
# Compare species richness between sites
# Set the working directory to the folder containing the code and array
file
library(rstudioapi)
wd <- setwd(dirname(rstudioapi::getActiveDocumentContext()$path))</pre>
wd
library(vegan)
library(dplyr)
# Import the array csv dataset, then make Site number into a row name
all sites<-read.csv('array.csv', header = T, sep=",")
AllSites community = all sites[3:83]
curve all <- specaccum(AllSites community, method = "random",</pre>
                      permutations = 100)
plot(curve_all, xlab = "Sites", ylab = "Species", lwd=1, col="black")
S#subset each habitat into its own df
all sites %>% filter(Site == "Synergy") -> Synergy
all sites %>% filter(Site == "Water Corporation") -> Water Corporation
all_sites %>% filter(Site == "Shire") -> Shire
#calc species accumulation curve for each habitat
curve Synergy = specaccum(Synergy[, 3:83], method = "random")
curve WC = specaccum(Water Corporation[, 3:83], method = "random")
curve shire = specaccum(Shire[, 3:83], method = "random")
#then plot the rest
plot(curve_Synergy, xlab = "Sites", ylab = "Species", lwd=1, col="blue")
plot(curve_WC, xlab = "Sites", ylab = "Species", lwd=1, col=3)
plot(curve_shire, xlab = "Sites", ylab = "Species", lwd=1, col=2)
#then plot them together rest
plot(curve all, xlab = "Sites", ylab = "Species", lwd=1, col="black")
plot(curve Synergy, add = TRUE, col = 2) #col is COLOUR setting, so
change it to something else if you want
plot(curve WC, add = TRUE, col = 3)
plot(curve shire, add = TRUE, col = 4)
```

```
# Compare species richness between sites
# Set the working directory to the folder containing the code and array
file
library(rstudioapi)
wd <- setwd(dirname(rstudioapi::getActiveDocumentContext()$path))</pre>
wd
# Import the array csv dataset, then make Site number into a row name
array<-read.csv('array.csv', header = T, sep=",")</pre>
library(textshape)
array1<-column to rownames(array,'Site Num')</pre>
# Split the array into species counts and environmental factors using c
to select columns and -c to drop columns
species<-subset(array1, select = -c(Site))</pre>
env<-subset(array, select = c(Site Num, Site))</pre>
# Calculate the number of sites using nrow
nrow(env)
# Calculate the number of species
ncol(species)
# Calculate species richness per site and treatment
library(vegan)
env$Richness<-specnumber(species)</pre>
# Calculate mean/se species richness per site and treatment
library(Rmisc)
mean rich status<-summarySE(data = env, measurevar="Richness",</pre>
groupvars="Site")
# Plot richness per site then produce and export bar plot
library(ggplot2)
mean rich plot<-ggplot(mean rich status, aes(x=Site, y=Richness,</pre>
fill=Site)) +
  geom bar(stat="identity") +
  geom errorbar(aes(ymin=Richness-se, ymax=Richness+se),
                width=.2) +
  theme(axis.title.x=element blank(), legend.position = "none")
mean rich plot
ggsave("mean_richness.png", height=10, width=15, units='cm', dpi=1000)
ggsave("mean richness.svg", height=10, width=15, units='cm', dpi=1000)
# Compare species richness between treatments via boxplot
rich_boxplot<-ggplot(env, aes(x = Site, y = Richness, fill = Site))+</pre>
  geom boxplot()+
  theme(axis.title.x=element blank(), legend.position = "none")
rich boxplot
ggsave("boxplot richness.png", height=10, width=15, units='cm', dpi=1000)
qqsave("boxplot richness.svq", height=10, width=15, units='cm', dpi=1000)
```

```
# Plot some rough species accumulation curve with 95% confidence
intervals across all sites to make an assessment of the data - exact
(sobs), random and rearefaction curves
# From the packages BiodiversityR and vegan
plot(specaccum(species, "exact"), xlab = "Sites", ylab = "Species", lwd=1,
col="blue")
plot(specaccum(species, "random"), xlab = "Sites", ylab = "Species",
lwd=1, col="red")
plot(specaccum(species, "rarefaction"), xlab = "Individuals", ylab =
"Species")
# Estimators for all sites combined
sp1 pool <- poolaccum(species, permutations = 1000)</pre>
summary(sp1 pool, display = c("chao"))
png('all_Site_curve.png')
plot(sp1 pool)
dev.off()
# Estimate of number of species by Site
data(species)
data(env)
attach (env)
pool <- specpool(species, Site)</pre>
print(sp1 pool)
# Examine species extrapolation curves using iNEXT package
library(iNEXT)
richness site<-with(env, split(Richness, Site))
str(richness site)
# Sample-size-based R/E curves, separating by "site"
# Hill numbers of order q: species richness (q = 0), Shannon diversity (q
= 1, the exponential of Shannon entropy) and Simpson diversity (q = 2,
the inverse of Simpson concentration).
# out <- iNEXT(treat matrix, q=c(0, 1, 2), datatype="abundance",</pre>
endpoint=200)
out <- iNEXT(richness site, q=0, datatype="abundance", endpoint=30)
out
# Sample-size-based R/E curve type 1
ggiNEXT(out, type=1, se=TRUE)+
   labs(x="Number of Individuals", y="Species Richness")
ggsave("sac site.png", height=10, width=15, units='cm', dpi=1000)
ggsave("sac site.svg", height=10, width=15, units='cm', dpi=1000)
# Sample completeness curve type 2
ggiNEXT(out, type=2, facet.var="none", se=TRUE)+
  labs(x="Number of Individuals", y="Sample Coverage")
ggsave("sac completeness.png", height=10, width=15, units='cm', dpi=1000)
ggsave("sac completeness.svg", height=10, width=15, units='cm', dpi=1000)
```

# Curve for the number of sampling units (sites)

```
# Claculate the curve - click on the plot to place the legend
library(vegan)
library(BiodiversityR)
c1<-accumcomp(species, y=env, factor='Site', method='rarefaction',</pre>
xlab='Sites', ylab='Species Richness')
# Get the data into a data frame and spread the data into a wide format
df0 <- as.data.frame.table(c1)</pre>
head(df0)
library(tidyr)
df <- spread(data = df0, key = Var3, value = Freq)</pre>
head(df)
# Calculate upper and lower sd and add to the data frame
df$up sd<-df$Richness+df$sd
df$low sd<-df$Richness-df$sd
# Plot onto a prettier plot using ggplot and export
raref plot<-ggplot(df, aes(x=Sites, y=Richness, colour=Site))+</pre>
  geom line(aes(data=Richness), size=2)+
  geom ribbon(aes(ymin=low sd, ymax=up sd,
                   fill=Site, colour=NULL), alpha=0.2)
raref plot
ggsave("rarefaction.png", height=10, width=15, units='cm', dpi=1000)
ggsave("rarefaction.svg", height=10, width=15, units='cm', dpi=1000)
# Calculate dissimilarity and plot divisive clustering:
library(cluster)
distmatrix <- vegdist(species, "bray")</pre>
cluster1 <- diana(distmatrix)</pre>
summary(cluster1)
plot(cluster1, which.plots=2, hang=-1, xlab="Site Number", sub="",
main="")
# grid(col="lightgrey", lty=1)
rect.hclust(cluster1, k=5, border="red")
abline(h = 0.32, lwd = 2, lty = 2, col = 'blue')
ggsave("dendro.png", height=10, width=15, units='cm', dpi=600)
ggsave("dendro.svg", height=10, width=15, units='cm', dpi=600)
# Synergy daya
Synergy data <- array[ which(Site=='Synergy'),]</pre>
# Split the array into species counts and environmental factors using c
to select columns and -c to drop columns
Sd1<-subset(Synergy data, select = -c(Site))</pre>
sd2<-column to rownames(Sd1,'Site Num')</pre>
library(cluster)
distmatrix <- vegdist(sd2, "bray")</pre>
cluster1 <- diana(distmatrix)</pre>
summary(cluster1)
```

```
png('synergy_cluster.png')
windows (10,10)
plot(cluster1, which.plots=2, hang=-1, xlab="Site", sub="", main="")
dev.off()
synergy curves <- poolaccum(sd2, permutations = 100)</pre>
summary(synergy curves, display = c("chao"))
png('synergy curves.png')
plot(synergy_curves)
# WC
WC_data <- array[ which(Site=='Water_Corporation'),]</pre>
# Split the array into species counts and environmental factors using c
to select columns and -c to drop columns
wc1<-subset(WC_data, select = -c(Site))</pre>
wc2<-column to rownames(wc1,'Site Num')</pre>
library(cluster)
distmatrix <- vegdist(wc2, "bray")</pre>
cluster2 <- diana(distmatrix)</pre>
summary(cluster2)
png('wc cluster.png')
plot(cluster2, which.plots=2, hang=-1, xlab="Site", sub="", main="")
dev.off()
wc curves <- poolaccum(wc2, permutations = 100)</pre>
summary(synergy curves, display = c("chao"))
png('wc_curves.png')
plot(wc_curves)
# Shire Cluster
Shire data <- array[ which(Site=='Shire'),]</pre>
# Split the array into species counts and environmental factors using c
to select columns and -c to drop columns
Shire1<-subset(Shire data, select = -c(Site))</pre>
Shire2<-column to rownames(Shire1,'Site Num')</pre>
library(cluster)
distmatrix <- vegdist(Shire2, "bray")</pre>
cluster3 <- diana(distmatrix)</pre>
summary(cluster3)
windows (10,10)
plot(cluster3, which.plots=2, hang=-1, xlab="Site", sub="", main="")
png('shire cluster.png')
dev.off()
shire curves <- poolaccum(Shire2, permutations = 100)</pre>
summary(shire curves, display = c("chao"))
```

png('shire\_curves.png')
windows(10,10)
plot(shire\_curves)



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