



**Discovery Holiday Parks**  
Woodman Point Caravan Park Expansion - Environmental  
Studies  
Flora and Fauna Survey

May 2020

# Executive summary

GHD was commissioned by Discovery Parks to undertake a detailed flora and vegetation survey and Level 1 fauna survey of the proposed Woodman Point Caravan Park expansion, located off Cockburn Road, Munster. The purpose of the survey is to delineate key flora, vegetation and fauna values and potential impact to areas of sensitivity. The outcomes of the assessment will be used to inform the project design and viability and for environmental approvals process.

The survey methodology and reporting was undertaken with reference to the Environmental Protection Authority (EPA) *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a), EPA Technical Guidance – Sampling methods for terrestrial vertebrate fauna (EPA 2016b) and Technical Guidance – Terrestrial Fauna Surveys (EPA 2016c).

This report is subject to, and must be read in conjunction with, the limitations set out in Section 1.6 and the assumptions and qualifications contained throughout the Report.

## **Key findings for the survey area:**

- Five vegetation types, not including cleared/highly degraded areas, have been mapped and described across the survey area. The survey area consists of a mix of remnant and revegetated coastal vegetation. Remnant vegetation in the survey area is dominated by *Acacia rostellifera* closed shrubland and *Melaleuca systena* shrubland over an understorey dominated by weedy herbs and grasses.
- No Threatened Ecological Communities (TEC's) listed under the EPBC Act and/or BC Act or Priority Ecological Communities (PEC's) listed by the DBCA were identified within the survey area during the field survey.
- The vegetation within the survey area ranged from *Good* to *Completely Degraded* condition and has been subject to a long history of disturbances including clearing, activity associated with the Munitions Magazines, weed invasion, introduced fauna (rabbits and foxes) and edge effects from adjacent land uses (caravan park and roads). Tree and shrub plantings are evident across the survey area.
- Sixty-three taxa (including subspecies and varieties) representing 31 families and 51 genera were recorded from the survey area during the field survey. This total comprised 31 native taxa and 32 introduced/weed flora taxa.
- Extensive weed invasion, which has replaced much of the ground layers, has occurred throughout the survey area. One weed species identified in the survey area, *\*Asparagus asparagoides* (Bridal Creeper), is listed as a Declared Pest under the *Biosecurity and Management Act 2007* and a Weed of National Significance (WoNS).
- No flora of conservation significance was recorded within the survey area. The likelihood of occurrence assessment for the survey area concluded that no conservation significant flora are likely to occur within the survey area.
- The survey area comprises of three main habitat types consisting of grassland, shrublands and scattered trees/mixed shrubs (revegetation/planted).
- During the field survey 25 fauna species were recorded within the survey area, including 20 bird, two mammal and three reptile species. Three of the species recorded are introduced.
- One conservation significant fauna species was recorded within the survey area during the field survey: Carnaby's Cockatoo (*Calyptorhynchus latirostris*) – listed as Endangered

under the EPBC Act and BC Act. A small flock of approximately 15 Carnaby's Cockatoos were observed feeding on the *Callitris preissii* (Rottnest Pine) trees in the north-east corner of the survey area.

- The survey area contains some suitable foraging habitat for black cockatoos. Suitable species include tuarts (*E. gomphocephala*) and Rottnest Pines (*Callitris preissii*).
- One potential Black Cockatoo breeding tree (tuart) with a DBH greater than 500 mm was recorded within the survey area. This tree did not contain any hollows. The majority of the tuarts in the survey area are young trees.
- No suitable black cockatoo roosting habitat is currently present in the survey area.

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# 1. Introduction

## 1.1 Project background

GHD has been engaged by Discovery Parks to undertake a range of environmental studies for the proposed expansion of Woodman Point Caravan Park located off Cockburn Road, Munster. The project will increase the current caravan park by 3.19 ha.

This report has been prepared by GHD to assess the potential impacts of the project on terrestrial flora and fauna.

## 1.2 Purpose of this report

GHD was commissioned by Discovery Parks to undertake a detailed flora and vegetation survey and Level 1 fauna survey of the proposed Woodman Point Caravan Park expansion. The purpose of the survey is to delineate key flora, vegetation and fauna values and potential impact to areas of sensitivity. The outcomes of the assessment will be used to inform the project design and viability and for environmental approvals process.

## 1.3 Location

The survey area for the project is located adjacent to Woodman Point Caravan Park, 132 Cockburn Road, Munster on Crown reserve R 49220.

The survey area is shown on Figure 1, Appendix A.

## 1.4 Scope of works

The scope of this report is as follows:

- A review of relevant databases including the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (PMST) and the Department of Biodiversity Conservation and Attractions (DBCA) NatureMap and FloraBase
- Undertake a biological survey to verify / ground truth the desktop assessment findings through a detailed flora and vegetation survey and a Level 1 fauna survey (reconnaissance survey)
- Conservation significant flora and fauna species were actively searched for based on habitat requirements and previous records.
- Vegetation types, condition, and conservation significant species were mapped where present
- The presence and significance of any Threatened Ecological Communities (TEC), Priority Ecological Communities (PEC) and any other areas of ecological importance was identified, mapped and discussed based on the results of the field survey
- An inventory of plant taxa (including weed species) was compiled
- An inventory of vertebrate fauna species was compiled through opportunistic recording of species, tracks, scats, bones, diggings and feeding areas
- A concise report (this document) on the findings of the biological survey

This report is subject to, and must be read in conjunction with, the limitations set out in Section 1.6 and the assumptions and qualifications contained throughout the report.

## **1.5 Relevant legislation, conservation codes and background information**

In Western Australia (WA) some communities, flora and fauna are protected under both Federal and State Government legislation. In addition, regulatory bodies also provide a range of guidance and information on expected standards and protocols for environmental surveys.

An overview of key legislation and guidelines, conservation codes and background information relevant to this biological survey is provided in Appendix B.

## **1.6 Report limitations and assumptions**

This report has been prepared by GHD for Discovery Parks and may only be used and relied on by Discovery Parks for the purpose agreed between GHD and Discovery Parks as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Discovery Parks arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report (including species listings). GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Discovery Parks and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of access tracks, operational works, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions may change after the date of the field survey. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

This report has assessed the flora and fauna within the survey area (Figure 1, Appendix A). Should the survey area change or be refined, further assessment may be required.

## 2. Methodology

### 2.1 Desktop assessment

Prior to the commencement of the field survey, a desktop assessment was undertaken to identify relevant environmental information pertaining to the survey area and to assist in survey design. This included a review of:

- The Department of the Environment and Energy (DotEE) Protected Matters Search Tool (PMST) to identify communities and species listed under the EPBC Act potentially occurring within the survey area (DotEE 2019a) (Appendix C)
- The DBCA TEC and PEC database to determine the potential for conservation significant communities to be present within the survey area (DBCA 2019a)
- The DBCA *NatureMap* database for flora and fauna species previously recorded within the survey area (DBCA 2007-2019) (Appendix D)
- The DBCA Threatened and Priority Flora (TPFL) database and the WA Herbarium database (WAHERB) for Threatened flora listed under the *Biodiversity Conservation Act 2016* (BC Act) and listed as Priority by the DBCA, previously recorded within the survey area (DBCA 2019b)
- Existing datasets including previous pre-European vegetation mapping of the survey area (Beard 1979; Heddle et al. 1980, Mattiske and Havel 1998 and Webb (DBCA) 2016), aerial photography, hydrology information to provide background information on the variability of the environment, likely vegetation units and fauna habitats and to identify areas that potentially contain TECs and PECs

### 2.2 Field survey

#### 2.2.1 Flora and vegetation

GHD ecologist Erin Lynch (flora licence no. SL012374) completed a single-season detailed flora and vegetation survey of the survey area on the 9 September 2019. The field survey was undertaken to identify and describe the dominant vegetation units, assess vegetation condition, and identify and record vascular flora taxa present at the time of survey. Searches for conservation significant or other significant ecological communities and flora taxa were also undertaken during the field survey.

The survey methods involved a combination of sampling quadrats, relevés and photographic reference points located in identified vegetation units and walking traverses. Quadrats (measuring 10 m x 10 m – area of 100 m<sup>2</sup>) were located within each identified vegetation unit. A minimum of three quadrats were located within each identified vegetation unit, where possible. Quadrats were not established in vegetation units that had been significantly altered by clearing and weeds. Relevés (unmarked area) were performed to supplement quadrat data and in areas where the vegetation was highly modified or size of the vegetation type was restricted. Field data at each quadrat was recorded on a pro-forma data sheet and included the parameters detailed in Table 1.

**Table 1 Data collected during the field survey**

Aspect	Measurement
Collection attributes	Site code, personnel/recorder; date, quadrat dimensions, photograph of the quadrat.
Physical features	Aspect, slope, landform, soil attributes, ground surface cover, leaf and wood litter.

Aspect	Measurement
Location	Coordinates recorded in GDA94 datum using a hand-held GPS tool to accuracy approximately $\pm 5$ m.
Vegetation condition	Vegetation condition was assessed using the condition rating scale adapted by EPA (2016a) for the South West Botanical Province.
Disturbance	Level and nature of disturbances (e.g. weed presence, fire and time since last fire, impacts from grazing, exploration activities).
Flora	List of dominant flora from each structural layer. List of all species within the quadrat including average height and cover (using NVIS)

A flora inventory was compiled from taxa listed in described quadrats and relevés and from opportunistic floristic records throughout the survey area.

The survey methodology employed by GHD was undertaken with reference to the Environmental Protection Authority (EPA) *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a).

### **Vegetation condition**

The vegetation condition was assessed and mapped in accordance with the vegetation condition rating scale for the South West and Interzone Botanical Provinces of Western Australia (IBRA) (devised by Keighery (1994) and adapted by EPA (2016a)). The scale recognises the intactness of vegetation and consists of six rating levels. The vegetation condition rating scale is located in Appendix B.

### **Flora identification and nomenclature**

Species well known to the survey botanist were identified in the field; all other species were collected and assigned a unique collection number to facilitate tracking. All specimens collected during the field assessment were dried and processed in accordance with the requirements of the WA Herbarium. Species were identified by the use of taxonomic literature, electronic keys and online electronic databases.

The conservation status of all recorded flora was compared against the current lists available on *FloraBase* (WA Herbarium 1998–2019) and the EPBC Act Threatened species database provided by DotEE (2019b). Nomenclature used in this report follows that used by the WA Herbarium as reported on *FloraBase* (WA Herbarium 1998–2019).

## **2.2.2 Fauna**

GHD ecologist Erin Lynch undertook a level 1 fauna survey (reconnaissance survey) in conjunction with the flora and vegetation survey. The survey area was traversed on foot over the course of the survey to identify and describe the dominant fauna habitat types present and their condition, assess habitat connectivity, and identify and record fauna species within the survey area. An assessment of the likelihood of conservation significant fauna and their habitats occurring within the survey area was also undertaken.

The survey methodology employed by GHD was undertaken in accordance with the EPA Technical Guidance – Sampling methods for terrestrial vertebrate fauna (EPA 2016b) and Technical Guidance – Terrestrial Fauna Surveys (EPA 2016c).

### **Opportunistic fauna searches**

Opportunistic fauna searches were also conducted across the survey area. Opportunistic searches involved:

- Searching the survey area for tracks, scats, bones, diggings and feeding areas for both native and feral species

- Searching through microhabitats including turning over logs or rocks, turning over leaf litter and examining tree hollows and hollow logs
- Visual and aural surveys, which accounted for many bird species potentially utilising the survey area
- Recording GPS locations of any conservation significant fauna species observed.

### **Targeted Black Cockatoo habitat assessment**

A Black Cockatoo habitat assessment (for Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo) was undertaken for the survey area to assess the presence, quality and extent of habitat. The assessment involved visual and aural assessment of the survey area, identifying breeding habitat (presence/absence of actual and potential breeding trees), foraging habitat, roosting areas, current activity and any other signs of use by Black Cockatoos. For the purpose of this assessment, the DSEWPaC (2012) Black Cockatoo referral guidelines were used to define breeding, foraging and night roosting habitat.

Information collected during the field survey included:

- Identification of suitable foraging habitat
- Record the location of suitable breeding trees - suitable breeding habitat for Black Cockatoos is defined by DSEWPaC (2012) as trees of species known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable Diameter at Breast Height (DBH) to develop a nest hollow. For most tree species on the Swan Coastal Plain, suitable DBH is 500 mm. On average, Carnaby's Black Cockatoos are known to nest in hollows with an entrance diameter greater than 20 - 30 cm (Johnstone and Storr 1998; Groom 2011). While the Forrest Red-tailed Black Cockatoo is known to nest in hollows with an entrance of greater than 12 cm (Johnstone and Storr 1998). Therefore, during the field survey hollows were graded into small (up to 6 cm) medium (6 to 10 cm) and large (10+ cm).
- Identification of night roosting habitat - suitable roosting habitat is defined by DSEWPaC (2012). Suitable roosting habitat was identified based on the presence of suitable tall trees, evidence of roosting (feathers, twig clips etc.) and proximity of known roosting sites in the survey area.
- Opportunistic observations - both visual and aural observations of Black Cockatoos within the survey area and surrounding region were noted during the survey.

### **Fauna species identification**

Identification of fauna species was made in the field using available field guides and electronic guides (e.g. Morcombe 2014). Where identification was not possible, photographs of specimens were collected to be later identified.

Nomenclature used in this report follows that used by the WA Museum as reported on *NatureMap*. This nomenclature is deemed the most up-to-date species information for WA fauna, with the exception of birds, which follows Christidis and Boles (2008).

## **2.3 Limitations**

### **2.3.1 Desktop limitations**

The EPBC Act PMST is based on bioclimatic modelling for the potential presence of species. As such, this does not represent actual records of the species within the area. The records from the DBCA searches of Threatened fauna provide more accurate information for the general area



and local occurrence. However, some collection, sighting or trapping records cannot be dated and often misrepresent the current range of Threatened species.

### 2.3.2 Field survey limitations

The EPA (2016a and 2016c) Technical Guide states flora and fauna survey reports for environmental impact assessment in WA should contain a section describing the limitations of the survey methods used. The limitations and constraints associated with this field survey are discussed in Table 2. Based on this assessment, the present survey effort has not been subject to any constraints which affect the thoroughness of the assessment and the conclusions which have been formed.

**Table 2 Field survey limitations**

Aspect	Constraint	Comment
Sources of information and availability of contextual information	Nil	Adequate information is available for the survey area.
Scope (what life forms were sampled etc.)	Nil	Vascular flora and terrestrial vertebrate fauna were sampled during the survey. Non-vascular flora, invertebrate and aquatic fauna were not surveyed.
Proportion of flora collected and identified (based on sampling, timing and intensity) Proportion of fauna identified, recorded and/or collected	Minor	The vegetation survey was a single season survey and was undertaken over one day in September (Spring). Spring is considered the most optimal time to undertake vegetation surveys in the Swan Coastal Plain bioregion. The vegetation survey was a broad scale and targeted assessment, undertaken to identify and describe the dominant vegetation units and map conservation significant flora and vegetation. The fauna survey (Level 1) was undertaken in conjunction with the flora and vegetation survey.
Flora determination	Minor	Flora determination was undertaken by GHD ecologists in the field and at the WA Herbarium. One taxa could only be identified to family level only, three taxa could be identified to genus level only, due to lack of flowering and/or fruiting material required for identification. None of these species were considered to be potential conservation significant flora. The taxonomy and conservation status of the WA flora is dynamic. This report was prepared with reliance on taxonomy and conservation status current at the time of report development, but it should be noted this may change in response to ongoing research and review of the International Union for Conservation Nature criteria.
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed)	Nil	The survey area was entirely accessible and was accessed by foot. The two Munition Magazines (historic sites) have been fenced off with no access however these areas have previously been cleared and were dominated by weed species.
Mapping reliability	Minor	The vegetation was mapped using high-resolution ESRI aerial imagery obtained from Landgate, topographical features, previous broad scale mapping (Beard 1979) and field data. Data was recorded in the field using hand-held GPS tools (e.g. Samsung tablet and Garmin

Aspect	Constraint	Comment
		GPS). Certain atmospheric factors and other sources of error can affect the accuracy of GPS receivers. The Garmin GPS units used for this survey are accurate to within $\pm 5$ metres on average. Therefore the data points consisting of coordinates recorded from the GPS may contain inaccuracies.
Timing/weather/season/cycle	Minor	The field survey was conducted in September 2019. In the three months prior to the flora survey (June to August), Perth weather station (Bureau of Meteorology (BoM) 2019) recorded a total of 334.8 mm of rainfall. This rainfall total is lower than the long term average for the same period (June-August; 455.7 mm) (BoM 2019). The weather conditions recorded during the survey were considered unlikely to have impacted the survey results. The survey timings were considered appropriate for the flora and fauna field surveys.
Disturbances (e.g. fire, flood, accidental human intervention)	Nil	Much of the survey area has been subjected to historical disturbance events (e.g. clearing, infrastructure, tracks); however, these disturbances did not impact the survey.
Resources	Nil	Adequate resources were employed during the field survey. One person days were spent undertaking the survey using an experienced ecologist.
Access restrictions	Nil	No access problems were encountered during the survey.
Experience levels	Nil	The ecologist who executed the survey is a practitioner suitably qualified and experienced in their respective fields. Erin Lynch has over 12 years' experience undertaking flora and fauna surveys within WA and on the Swan Coastal Plain bioregion.

## 3. Desktop assessment

### 3.1 Regional biogeography

The survey area is situated in the South West Botanical Province of Western Australia (Beard 1990) within the Swan Coastal Plain bioregion and Perth sub-region described by the Interim Biogeographic Regionalisation of Australia (IBRA) (DotEE 2019b).

The Swan Coastal Plain bioregion is a low lying coastal plain, mainly covered with woodlands. The Perth sub-region is characterised by colluvial and aeolian sands, alluvial river flats and coastal limestone. Heath and/or Tuart woodlands occur on limestone, Banksia and Jarrah-Banksia woodlands on Quaternary marine dunes of various ages, and Marri on colluvial and alluvials. The region also includes a complex series of seasonal wetlands (Mitchell *et al.* 2002).

### 3.2 Soils, geology and landforms

The project lies on the Swan Coastal Plain, which is part of the larger Perth Basin. Soil-landscape mapping of South West WA indicates that the project is within the Quindalup South System. This is described as; Coastal dunes, of the Swan Coastal Plain, with calcareous deep sands and yellow sands. Coastal scrub.

### 3.3 Environmentally Sensitive Area

The entirety of the survey area is located within an ESA, with a further five ESAs occurring within the 5 km study area. The majority of these ESAs appear to align with Bush Forever sites and Threatened Ecological Communities.

### 3.4 Vegetation and flora

#### 3.4.1 Broad vegetation association

Broad scale (1:250,000) pre-European vegetation mapping of the Perth area was completed by Beard (1979) at an association level. The mapping indicates that one vegetation association is present within the survey area

- Medium woodland; tuart (association 998).

The pre-European mapping has been adapted and digitised by Shepherd *et al.* (2002). The extent of vegetation associations have been determined by the state-wide vegetation remaining extent calculations maintained by DBCA (latest update December 2019 – GoWA 2019). As shown in Table 3, the current extent remaining of vegetation association 998 is more than 36% at scales, State, IBRA bioregion, IBRA subregion, with the exception of the Local Government Area (LGA) which is less than 20%..

Regional vegetation has also been mapped by Heddle *et al.* (1980) based on major geomorphic units on the Swan Coastal Plain. The Heddle *et al.* (1980) mapping indicates that one vegetation complex is present within the survey area:

- Cottesloe Complex-Central and South: Mosaic of woodland of *Eucalyptus gomphocephala* (Tuart) and open forest of *Eucalyptus gomphocephala* (Tuart) - *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri); closed heath on the Limestone outcrops.

GoWA (2018d) has assessed the vegetation complexes mapped by Heddle *et al.* (1980) against presumed pre-European extents within the Swan Coastal Plain (Table 4) and the City of Gosnells (Table 5). The Cottesloe Complex Central and South has greater than 30% of its pre-

European extent remaining on the Swan Coastal Plain, but less than 30% of its pre-European extent remaining in the City of Cockburn.

**Table 3 Extents of vegetation complexes on the Swan Coastal Plain mapped within the survey area**

Vegetation association	Scale	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	% Current extent in all DBCA managed land (proportion of current extent)
998	State: Western Australia	51,015.33	18,492.63	36.25	48.68
	IBRA Bioregion: Swan Coastal Plain	50,867.50	18,492.32	36.35	48.68
	IBRA Subregion: Perth	50,867.50	18,492.32	36.35	48.68
	LGA: City of Cockburn	4,464.34	845.02	18.93	34.36

**Table 4 Extent of vegetation complexes on the SWA mapped within the survey area (GoWA 2019)**

Vegetation complex	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	% Current extent in all DBCA managed lands
Cottesloe Complex-Central and South	45,299.61	14,567.87	32.16	14.58

**Table 5 Extent of vegetation complexes within the City of Cockburn for the survey area (GoWA 2019)**

Vegetation complex	Pre-European extent (ha)	Current extent (ha)	% of pre-European extent	Proportion of the vegetation complex within the LGA %
Cottesloe Complex-Central and South	4,990.60	961.70	19.27	11.02

### 3.4.2 Conservation significant ecological communities

The EPBC Act PMST (DotEE 2019a) identified the potential presence of two TEC's occurring within the study area:

- Banksia Woodlands of the Swan Coastal Plain TEC. Listed as Endangered under the EPBC Act
- Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain TEC. Listed as Critically Endangered under the EPBC Act

These TECs were also identified in a search of the DBCA TEC/PEC database along with one additional TEC and one PEC:

- *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands, Swan Coastal Plain (FCT30a) –Vulnerable under BC Act

- Northern Spearwood shrublands and woodlands (FCT24) – Priority 3

The extents of TEC and PEC buffers based on the DBCA search results are provided on Figure 2, Appendix A.

The survey area is located within the known occurrence/buffer area of one State-listed TEC. The TEC is identified as *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands (Swan Coastal Plain community type 30a) listed under the *Biodiversity and Conservation Act 2016* (BC Act). The community was endorsed as a TEC with a threat ranking of Vulnerable by the WA Minister for Environment in November 2011.

This TEC is described as a woodland and forest community located on calcareous sandy soils of the Quindalup Dunes between Trigg and Point Peron and on the Swan River in Peppermint Grove. The community is also present on Garden Island and Rottnest Island. Typical and common native taxa in the community are: *Callitris preissii*, *Melaleuca lanceolata*, *Spyridium globulosum*, *Acanthocarpus preissii*, *Rhagodia baccata*, *Austrostipa flavescens* and *Trachymene pilosa* (Gibson et al. 1994). The introduced herbs *\*Galium murale* (small bedstraw), *\*Asparagus asparagoides* (bridal creeper) and *\*Trachyandra divaricata* (dune onion weed) are common in the community (DPaW 2014). The coastal occurrences of this TEC occur on calcareous sandy soils associated with the Quindalup dunes and the Swan River occurrence is on the Aeolian deposits of the Cottesloe complex – central and south. Species richness is naturally quite low in the community. There have not been any detailed groundwater studies completed for this community but it is believed that this community is at least a partially groundwater dependent ecosystem (Department of Parks and Wildlife (DPaW) 2014).

### 3.4.3 Flora diversity

The *NatureMap* database identified 281 flora taxa, representing 79 families and 194 genera previously recorded within the survey area. This total comprised 171 native taxa and 110 naturalised (introduced) taxa. Dominant families recorded included Fabaceae (65 taxa), Poaceae (59 taxa) and Asteraceae (38 taxa).

The *NatureMap* database search is provided in Appendix C.

### 3.4.4 Conservation significant flora

Searches of the EPBC Act PMST, *NatureMap* database and DBCA TPFL and WAHERB databases identified the presence/potential presence of 20 conservation significant flora taxa within the study area. The searches identified six Threatened taxa listed under the EPBC Act and/or BC Act and 14 Priority taxa listed by the DBCA

The locations of conservation significant flora registered on the DBCA databases are mapped on Figure 2, Appendix A.

## 3.5 Fauna

### 3.5.1 Fauna diversity

The *NatureMap* database identified 336 fauna species previously recorded within 5 km of the survey area. This total comprised 172 birds, 35 reptiles, 11 mammals, 4 amphibians, and 52 invertebrates and 62 fish. Of the 336 fauna species previously recorded 327 are native species and 9 are naturalised (introduced) species.

The *NatureMap* database search is provided in Appendix C.

### **3.5.2 Conservation significant fauna**

Searches of the EPBC Act PMST and *NatureMap* database identified the presence/potential presence of 65 conservation significance fauna within the survey area. This total does not include those species that are exclusively marine as no marine habitat is present within the survey area or indirectly impacted by the project.

The desktop searches identified:

- 33 species listed as Threatened under the EPBC Act and/or as Threatened under the BC Act (many are also listed as Migratory under the EPBC Act/BC Act)
- 21 bird species listed as Migratory only (terrestrial and wetland) under the EPBC Act and/or as Migratory species under the BC Act
- One species listed as Other specially protected fauna under the BC Act
- 10 species listed as Priority by DBCA.



## 4. Field survey results

### 4.1 Flora and vegetation

#### 4.1.1 Vegetation types

The survey area consists of a mix of remnant and revegetated coastal vegetation. The landform and soils comprises of a tertiary dune system with grey to brown sandy soils. The survey area has experienced a long history of disturbances and includes the site of old Munitions Magazines (bunkers and blast barriers) from World War II which have been fenced around due to hazardous substances (i.e. asbestos). The area immediately surrounding the munition magazines has previously been cleared or disturbed and it is evident that many of the trees and shrubs have been planted to restore the area, including young tuarts and Rottnest pines. Remnant vegetation in the survey area is dominated by *Acacia rostellifera* closed shrubland and *Melaleuca systena* shrubland over an understorey dominated by weedy herbs and grasses.

Five vegetation types, not including cleared/highly degraded area, have been mapped and described across the survey area:

- *Acacia* closed shrubland (VT01)
- *Melaleuca* shrubland (VT02)
- \**Cenchrus* grassland (VT03)
- Revegetation (VT04)
- Planted (VT05)

The vegetation types are described in further detail in Table 6 and mapped in Figure 3, Appendix A.



#### 4.1.2 Vegetation condition

The vegetation within the survey area ranged from *Good* to *Completely Degraded* condition. The survey area appears to have been subject to a long history of disturbances including clearing, activity associated with the Munitions Magazines, weed invasion, introduced fauna (rabbits and foxes) and edge effects from adjacent land uses (caravan park and roads). A number of trees and shrub species were observed to have plastic plant bags around their bases which may be a result of previous revegetation projects in the area. The ground cover is dominated by weed species including \**Asphodelus fistulosus*, \**Pelargonium capitatum*, \**Briza maxima*, \**Oxalis pes-caprae*, \**Cenchrus setaceus*, \**Fumaria capreolata* and \**Lagurus ovatus*.

The *Acacia* Closed Shrubland and *Melaleuca* Shrubland are generally in good condition however much of the ground cover is dominated by weed species including \**Asphodelus fistulosus*, \**Asparagus asparagoides*, \**Euphorbia paralias* and \**Ammophila arenaria*.



The vegetation condition of the survey area is mapped on Figure 4, Appendix A.

**Table 6 Vegetation types recorded within the survey area**

Vegetation type	Vegetation type description	Landform/substrate	Representative photograph
Acacia Closed Shrubland (VT01)	<i>Acacia rostellifera</i> and <i>Spyridium globulosum</i> closed shrubland with scattered emergent <i>Eucalyptus gomphocephala</i> over <i>*Fumaria capreolata</i> , <i>*Oxalis pes-caprae</i> , <i>Spergularia marina</i> and <i>*Euphorbia</i> spp. herbland over <i>*Asparagus asparagoides</i> and <i>Clematis linearifolia</i> open vineland.	Tertiary dunes and dune swales. White/grey sand.	
Melaleuca Shrubland (VT02)	<i>Melaleuca systema</i> , <i>Spyridium globulosum</i> and <i>*Leptospermum laevigatum</i> shrubland with scattered emergent <i>Eucalyptus gomphocephala</i> over <i>Leucopogon parviflorus</i> , <i>Rhagodia baccata</i> and <i>Acanthocarpus preissii</i> low open shrubland over <i>Austrostipa elegantissima</i> , <i>*Lagurus ovatus</i> and <i>*Avena barbata</i> open grassland over <i>Spergularia marina</i> , <i>*Fumaria capreolata</i> and <i>*Pelargonium capitatum</i> open herbland over <i>*Asparagus asparagoides</i> and <i>Clematis linearifolia</i> open vineland.	Low undulating dunes.	



Vegetation type	Vegetation type description	Landform/substrate	Representative photograph
* <i>Cenchrus</i> Grassland (VT03)	<i>Acanthocarpus preissii</i> , <i>Acacia cochlearis</i> and <i>Spyridium globulosum</i> scattered shrubs over * <i>Cenchrus setaceus</i> , <i>Schoenus grandiflorus</i> and * <i>Lagurus ovatus</i> grassland over * <i>Brassica tournefortii</i> , * <i>Euphorbia terracina</i> and * <i>Pelargonium capitatum</i> open herbland.	Sandy upper dune. White/grey sand.	
Revegetation (VT04)	<p>Previously cleared areas where natural regrowth of some native plant species has occurred. Natural regrowth is scattered with an understorey dominated by introduced grasses and herbs.</p> <p>Evidence of revegetation of native trees and shrubs (plastic plant bags) was present around a number of tree species including <i>Eucalyptus gomphocephala</i> (tuart) and <i>Callitris preissii</i> (Rottneest Pine).</p>	Sandy plain and low undulating dunes. Grey/brown sand.	

Vegetation type	Vegetation type description	Landform/substrate	Representative photograph
Planted (VT05)	Planted trees and shrubs located along the boundary of the existing caravan park. Species include non-native <i>Eucalyptus</i> , <i>Agonis flexuosa</i> , <i>Adenanthos sericeus</i> and <i>Grevillea</i> sp.	Grey/brown sand. Plain.	
Cleared/ Highly disturbed	Generally completely cleared of native vegetation and consists of roads, tracks, planted non-native vegetation and building structures.	-	

### 4.1.3 Conservation significant ecological communities

No TEC's listed under the EPBC Act or WC Act or PECs listed by the DBCA were identified within the survey area during the field survey.

#### *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands TEC

The survey area is situated within a known occurrence of the *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands TEC (Swan Coastal Plain community type 30a – Gibson et al. 1994). There are small patches/isolated trees of *Callitris preissii* scattered in the survey area in the area mapped as 'Revegetation'. It was evident that these trees had been planted with plastic plant bags remaining around many of the trunks. The vegetation in the survey area has been subject to a long history of disturbances including clearing and the natural structure of the vegetation has been severely altered. Weed species completely dominate the ground layer of the vegetation remaining in the survey area. The vegetation within the survey area does not meet the key diagnostic criteria for this TEC (Department of Parks and Wildlife 2014).

#### *Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain TEC*

Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain has recently been upgraded as a TEC under the EPBC Act and BC Act. A number of young tuart trees are scattered throughout the survey area. It was evident many of these trees had been planted whilst some are likely a result of natural regeneration.

One of the key diagnostic characteristics of this TEC (DotEE 2019d) is the presence of at least two living established tuart trees in the uppermost canopy layer, although they may occur with trees of other species. Additionally there is a gap of no more than 60 m between the outer edges of the canopies of adjacent tuart trees. The survey area contains only two isolated mature tuart trees which are greater than 60 m apart. The tuarts within the survey area are young and scattered and do not form a continuous upper canopy. There is likely to be a patch north of the survey area however this patch does not intersect with the current survey area.

The vegetation within the survey area does not meet the key diagnostic criteria for this TEC (DotEE 2019d).

### 4.1.4 Flora diversity

Sixty-three taxa (including subspecies and varieties) representing 31 families and 51 genera were recorded from the survey area during the field survey. This total comprised 31 native taxa and 32 introduced/weed flora taxa.

Dominant families recorded from the survey area included:

- Poaceae (9 taxa)
- Myrtaceae (7 taxa)
- Fabaceae (5 taxa)
- Asteraceae (5 taxa).

Flora recorded in the survey area is provided in Appendix D.

### 4.1.5 Introduced flora

Extensive weed invasion, which has replaced much of the ground layers, has occurred throughout the survey area. Of the 32 introduced taxa recorded within the survey area, one



species, \**Asparagus asparagoides* (Bridal Creeper), is listed as a Declared Pest under the *Biosecurity and Management Act 2007* and a Weed of National Significance (WoNS).

#### **4.1.6 Conservation significant flora**

No flora of conservation significance was recorded within the survey area.

#### ***Likelihood of occurrence***

A likelihood of occurrence assessment was conducted post-field survey for all conservation significant flora taxa identified in the desktop assessment (Appendix C). This assessment took into account previous records, habitat requirements, efficacy of the survey, intensity of the survey, flowering times and the cryptic nature of species.

The likelihood of occurrence assessment for the survey area concluded that no conservation significant flora are likely to occur within the survey area.

## **4.2 Fauna**



### **4.2.1 Fauna habitat**


The survey area comprises of three main habitat types consisting of grassland, shrublands and scattered trees/mixed shrubs (revegetation/planted). The understorey throughout the survey area is generally sparse and comprised mostly of introduced herbs and grasses. The trees and shrubs provide good value fauna habitat, particularly for bird species, providing shelter and food resources. Some areas have been highly degraded by historical clearing (tracks, old buildings) and provide very little to no habitat value for most fauna species as these areas are generally devoid of vegetation.

The fauna habitat of the survey area is described in further detail in Table 7 and mapped on Figure 5, Appendix A.



**Table 7 Fauna habitat types within the survey area**

Habitat type	Description	Representative photo
Grassland	<p>Grassland dominated by <i>*Cenchrus setaceus</i>, with scattered shrubs of <i>Acanthocarpus preissii</i>, <i>Acacia cochlearis</i> and <i>Spyridium globulosum</i> on sandy upper dunes. Ground cover is relatively low with limited leaf litter and structural diversity. This habitat would be utilised by skinks, burrowing reptiles, small birds and mammal species.</p> <p><b>Conservation significant fauna</b>                      The deep sandy soils provide suitable habitat for <i>Lerista lineata</i> (P3) and <i>Neelaps calonotos</i> (P3). The Peregrine Falcon (OS) would opportunistically utilise this habitat for foraging.</p>	
Mixed Shrublands	<p>Open to closed mixed shrublands dominated by <i>Acacia rostelifera</i>, <i>Spyridium globulosum</i>, <i>Melaleuca systena</i> and <i>*Leptospermum laevigatum</i> on secondary coastal dunes. The understory was generally covered in introduced grasses and herbs or bare sandy soil. Scattered shrubs include <i>Acanthocarpus preissii</i>, <i>Leucopogon parviflorus</i> and <i>Rhagodia baccata</i>. The Acacia thicket provides good fauna habitat, particularly for small bird species, providing shelter and food resources. This habitat would also be utilised by a number of coastal species such as skinks, burrowing reptiles, and mammal species. These areas also provides ideal habitat for burrowing skinks.</p> <p><b>Conservation significant fauna</b>                      The sandy soils provide suitable habitat for <i>Lerista lineata</i> and <i>Neelaps calonotos</i>. The dense shrubs provide suitable habitat for Quenda (P4).</p>	

Habitat type	Description	Representative photo
Scattered trees/mixed shrubs	<p>Comprises of previously cleared areas where natural regrowth of some native plant species has occurred. Natural regrowth is scattered with an understorey dominated by introduced grasses and herbs. Tree species include <i>Eucalyptus gomphocephala</i> (tuart) and <i>Callitris preissii</i> (Rottnest Pine). Majority of the tuart trees were young with only one tree identified as a potential black cockatoo habitat tree with a DBH greater than 500 mm.</p> <p>Logs and woody debris were scattered and litter was associated to tuarts and shrubs with areas of bare sandy ground present in between vegetation.</p> <p><b>Conservation Significant Fauna</b></p> <p>One conservation significant species were observed utilising this habitat; the Carnaby's Cockatoo (Endangered) was observed feeding on <i>Callitris preissii</i>. This habitat is likely to be used opportunistically by Black Cockatoo species (for foraging) and other mobile species such as the Peregrine Falcon, Masked Owl (P3), Osprey (Mi) and in denser areas the Quenda. <i>Neelaps calanotos</i> is likely to utilise this habitat due to the deep sands but restricted to dense litter areas. <i>Lerista lineata</i> may also utilise the sandy soils in this area.</p>	

#### 4.2.2 Fauna diversity

During the field survey 25 fauna species were recorded within the survey area, including 20 bird, two mammal and three reptile species. Three of the species recorded are introduced.

A full list of fauna recorded during the survey is provided in Appendix D.

#### 4.2.3 Conservation significant fauna

One conservation significant fauna species was recorded within the survey area during the field survey: Carnaby's Cockatoo (*Calyptorhynchus latirostris*) – listed as Endangered under the EPBC Act and BC Act. A small flock of approximately 15 Carnaby's Cockatoos were observed feeding on the *Callitris preissii* (Rottnest Pine) trees in the north-east corner of the survey area.

##### *Likelihood of occurrence*

A likelihood of occurrence assessment was conducted for all conservation significant fauna species identified in the desktop assessment. This assessment was based on species biology, habitat requirements, the likely quality and availability of suitable habitat (based on vegetation associations present within the survey area) and records of the species in the vicinity of the survey area. The assessment is provided in Appendix D.

Of the 65 conservation significant fauna identified in the desktop searches one is identified as present (Carnaby's Cockatoo) and seven are considered likely to occur, including:

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – Vulnerable (EPBC Act and BC Act)
- Peregrine Falcon (*Falco peregrinus*) – Other Specially Protected Fauna (BC Act)
- Osprey (*Pandion cristatus*) – Migratory (EPBC Act and BC Act)
- Masked Owl (*Tyto novaehollandiae* subsp. *novae-hollandiae*) – Priority 3 (DBCA)
- Quenda (*Isodon fusciventer*) – Priority 4 (DBCA)
- Perth Lined Skink (*Lerista lineata*) – Priority 3 (DBCA)
- Black-striped Snake (*Neelaps calonotos*) – Priority 3 (DBCA)

No evidence of these species was recorded in the survey area during the survey. Given the small size and fragmented nature of the survey area and history of disturbances, clearing of the survey area is unlikely to have a significant impact on the above conservation significant fauna species.

#### 4.2.4 Targeted black cockatoo assessment

One species of Black Cockatoo, Carnaby's Cockatoo, was recorded during the survey. The Forest Red-tailed Black Cockatoo was also identified as likely to occur as an opportunistic visitor.

##### *Foraging habitat*

The survey area contains some suitable foraging habitat for black cockatoos. Suitable species include tuarts (*E. gomphocephala*) and Rottnest Pines (*Callitris preissii*). These species were scattered throughout the survey area but mostly associated with VT04 (Revegetation) and VT02 (*Melaleuca* shrubland). VT04 and VT02 are considered to have low to moderate foraging value for black cockatoos. The remaining vegetation types are considered to have nil to negligible foraging value.

### ***Breeding habitat***

One potential breeding tree (tuart) with a DBH greater than 500 mm was recorded within the survey area. This tree did not contain any hollows. The majority of the tuarts in the survey area are young trees.

### ***Roosting habitat***

No suitable black cockatoo roosting habitat is currently present in the survey area.



## 5. References

Beard, JS 1979, *Vegetation Survey of Western Australia: the Vegetation of the Perth Area Western Australia*, map and explanatory memoir 1:250,000 series, Applecross, Vegmap Publications.

Bureau of Meteorology (BoM) 2019, *Climate Data Online*, retrieved September 2019, from <http://www.bom.gov.au/climate/data/>.

Christidis, L and Boles, WE 2008, *Systematics and Taxonomy of Australian Birds*, Melbourne, CSIRO Publishing.

Churchwood H.M. and McArthur W.M. 1984, Darling System, Landforms and Soils, Department of Conservation and Environment, Western Australia.

Department of Biodiversity, Conservation and Attractions (DBCA) 2007–, *NatureMap: Mapping Western Australia's Biodiversity*, retrieved August 2019, from <https://naturemap.dpaw.wa.gov.au/default.aspx>.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) 2012, *EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species*, Canberra, Australia, Department of Sustainability, Environment, Water, Population and Communities.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) 2019, Species Profile and Threats Database (SPRAT), Department of Sustainability, Environment, Water, Population and Communities, Australian Government Canberra.

Department of the Environment and Energy (DotEE) 2019a, *Environmental Protection and Biodiversity Conservation Act 1999 Protected Matters Search Tool Results*, retrieved August 2019, from <http://www.environment.gov.au/epbc/pmst/index.html>.

Department of the Environment and Energy (DotEE) 2019b, *Species Profile and Threats Database (SPRAT)*, retrieved September 2019, from <http://www.environment.gov.au/cgi-bin/sprat/public/>.

Department of the Environment and Energy (DotEE) 2019c, *Interim Biogeographic Regionalisation of Australia*, Version 7, retrieved August 2019, from <http://www.environment.gov.au/land/nrs/science/ibra/australias-bioregions-maps>.

Department of the Environment and Energy (DotEE) 2019d, *Approved Conservation Advice (incorporating listing advice) for the Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain ecological community*. Canberra: Department of the Environment and Energy. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/153-conservation-advice.pdf>

Department of Parks and Wildlife 2014, *Callitris preissii (or melaleuca lanceolata) forests and woodlands (Swan Coastal Plain community type 30a – Gibson et al. 1994). Interim Recovery Plan No. 340*. Department of parks and Wildlife, Perth.

Environmental Protection Authority (EPA) 2016a, *Technical Guidance – Sampling methods for terrestrial vertebrate fauna*, Perth, Environmental Protection Authority.

Environmental Protection Authority (EPA) 2016b, *Technical Guidance – Terrestrial Vertebrate Fauna Surveys*, Perth, Environmental Protection Authority.

Garnett S.T. & Crowley G.M. 2000, *The Action Plan for Australian Birds 2000*. Environment Australia, Canberra

Mitchell, D, Williams, K & Desmond, A 2002, *Swan Coastal Plain 2 (SWA2 — Swan Coastal Plain subregion)*, in Department of Conservation and Land Management (ed), *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002*, pp 724.



# Appendices

# **Appendix A – Figures**

**Figure 1 Survey Area**

**Figure 2 Environmental Constraints**

**Figure 3 Vegetation Types**

**Figure 4 Vegetation Condition**

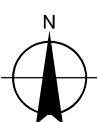
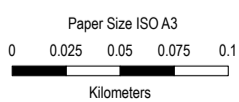
**Figure 5 Fauna Habitat Types and Significant Fauna Records**





**Legend**

- State Highway
- Minor Road
- Track
- Project Area



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Survey Area

**FIGURE 1**



**Legend**

**Threatened and Priority Flora**

- 4 Priority 4

**Threatened and Priority Fauna**

- Critically endangered species (CR) Protected under International Agreement (IA)
- Endangered Species (EN)
- Endangered Species (EN) Protected under International Agreement (IA)
- Vulnerable Species (VU)
- Vulnerable Species (VU) Protected under International Agreement (IA)

- Migratory Species Protected under International Agreement (IA)
- Other Specially Protected Species (OS)
- Priority 3 (P3)
- Priority 4 (P4)

**Survey Area**

- 

**Priority Ecological Community**

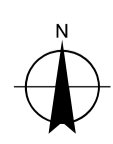
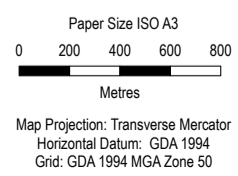
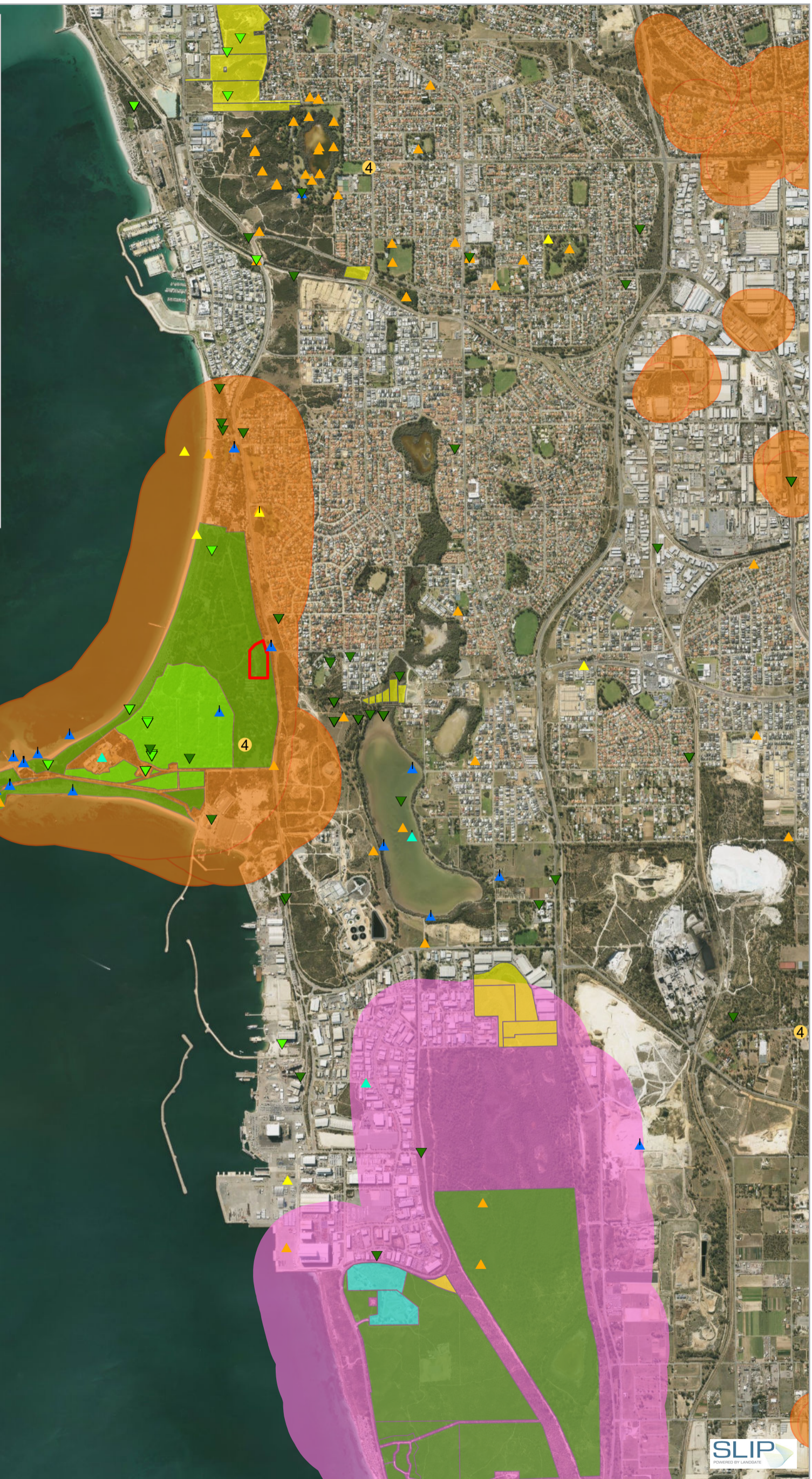
- 

**Threatened Ecological Community**

- 

**DBCA Legislated Lands and Waters**

- Conservation Park
- Crown Freehold - Dept Managed
- Nature Reserve
- Section 5(1)(h) Reserve



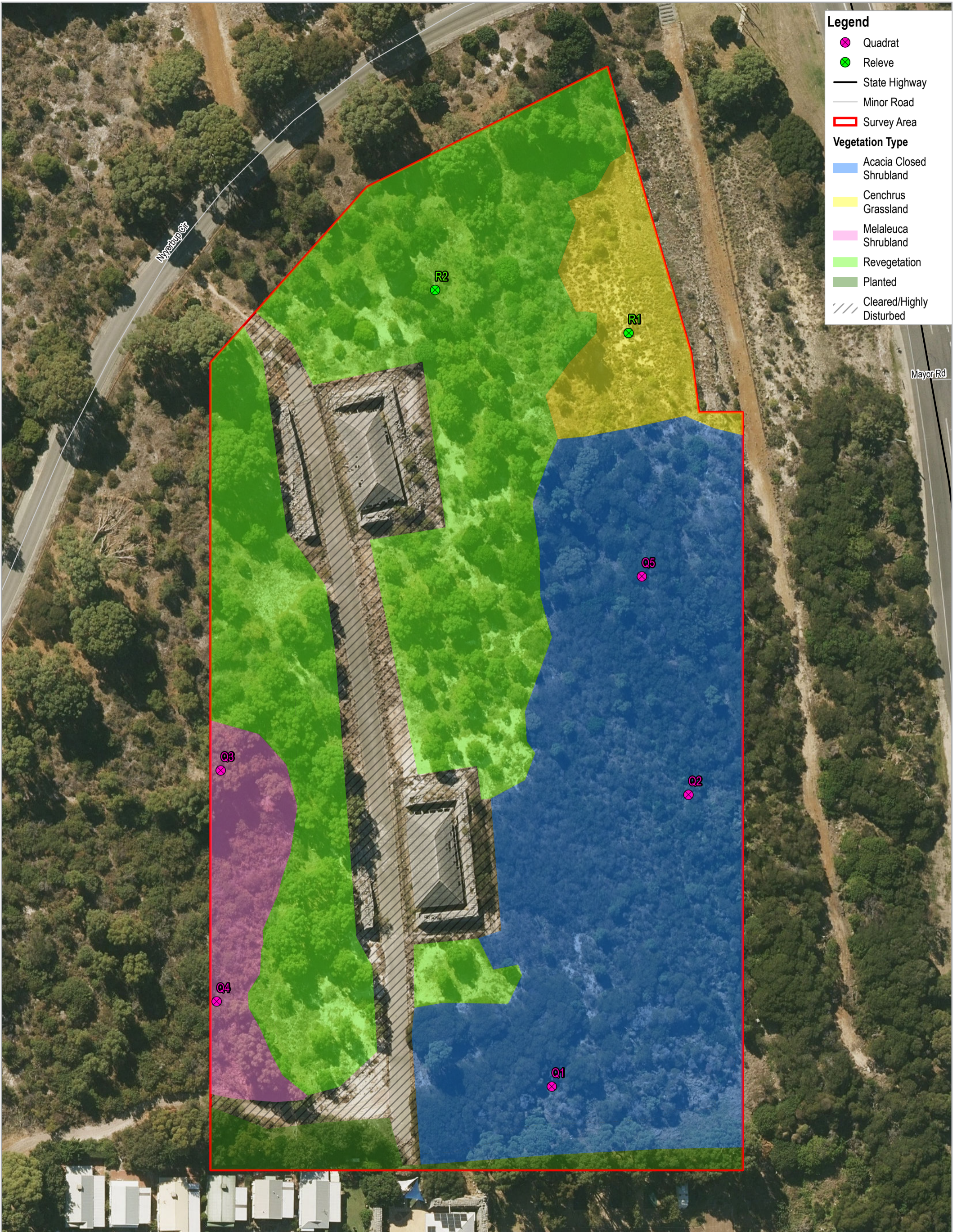
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**Environmental Constraints**

**FIGURE 2**





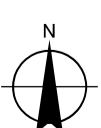
**Legend**

- ⊗ Quadrat
- ⊗ Releve
- State Highway
- Minor Road
- Survey Area

**Vegetation Type**

- Acacia Closed Shrubland
- Cenchrus Grassland
- Melaleuca Shrubland
- Revegetation
- Planted
- Cleared/Highly Disturbed

Paper Size ISO A3  
 0 5 10 15 20  
 Metres  
 Map Projection: Transverse Mercator  
 Horizontal Datum: GDA 1994  
 Grid: GDA 1994 MGA Zone 50



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**Vegetation Type**

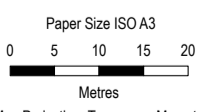
**FIGURE 3**



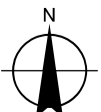


**Legend**

- State Highway
- Minor Road
- ▭ Survey Area
- VegCond**
- ▭ Good
- ▭ Degraded
- ▭ Completely Degraded



Map Projection: Transverse Mercator  
 Horizontal Datum: GDA 1994  
 Grid: GDA 1994 MGA Zone 50



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**Vegetation Condition**

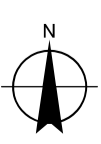
**FIGURE 4**





- Legend**
- ★ Potential Black Cockatoo Habitat Tree
  - ★ Carnaby's Cockatoo (observed feeding)
  - State Highway
  - Minor Road
  - Survey Area
- Fauna Habitat**
- Mixed Shrublands
  - Grassland
  - Scattered Trees/Mixed Shrubs
  - Cleared/Highly Disturbed

Paper Size ISO A3  
 0 5 10 15 20  
 Metres  
 Map Projection: Transverse Mercator  
 Horizontal Datum: GDA 1994  
 Grid: GDA 1994 MGA Zone 50



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**Fauna Habitat and  
 Threatened Species Records**

**FIGURE 5**



## **Appendix B** – Conservation codes

## **Appendix C** – Desktop searches

Naturemap Flora

Naturemap Fauna

EPBC Act Protected Matters Search

# NatureMap Species Report

Created By Guest user on 11/09/2019

**Kingdom** Plantae  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Method** 'By Circle'  
**Centre** 115° 45' 58" E, 32° 07' 36" S  
**Buffer** 5km  
**Group By** Family

Family	Species	Records
Aizoaceae	3	4
Amaranthaceae	3	5
Amaryllidaceae	1	1
Anarthriaceae	1	1
Apiaceae	5	10
Araliaceae	1	3
Asparagaceae	8	18
Asphodelaceae	2	3
Asteraceae	23	38
Brassicaceae	4	4
Bryaceae	1	2
Campanulaceae	1	1
Caprifoliaceae	1	4
Caryophyllaceae	6	13
Casuarinaceae	1	1
Chenopodiaceae	7	9
Convolvulaceae	3	5
Crassulaceae	3	11
Cupressaceae	1	9
Cymodoceaceae	2	2
Cyperaceae	10	19
Dilleniaceae	4	8
Droseraceae	2	3
Ericaceae	2	5
Euphorbiaceae	4	8
Fabaceae	32	66
Fissidentaceae	1	2
Frankeniaceae	1	3
Gentianaceae	1	3
Geraniaceae	4	7
Goodeniaceae	3	3
Gyrostemonaceae	1	2
Haemodoraceae	3	5
Haloragaceae	2	3
Hemerocallidaceae	2	2
Iridaceae	1	4
Juncaceae	1	1
Juncaginaceae	1	1
Lamiaceae	2	2
Lauraceae	2	7
Linaceae	1	1
Loganiaceae	1	1
Malvaceae	7	10
Montiaceae	3	5
Myrtaceae	14	26
Onagraceae	2	4
Ophioglossaceae	1	1
Orchidaceae	6	8
Orobanchaceae	2	2
Papaveraceae	2	3
Phyllanthaceae	1	5
Phytolaccaceae	1	1
Pinaceae	2	2
Plantaginaceae	2	2
Poaceae	32	62
Polygalaceae	2	6
Polyphysaceae	1	2
Pottiaceae	5	11
Primulaceae	2	3
Proteaceae	8	15
Racopilaceae	1	1
Ranunculaceae	2	5
Restionaceae	2	2
Rhamnaceae	3	10
Rhodomelaceae	1	1
Rubiaceae	3	9
Rutaceae	1	2
Santalaceae	2	2
Sapindaceae	1	6
Scrophulariaceae	3	4
Solanaceae	7	14
Stylidiaceae	2	4
Thymelaeaceae	2	2
Urticaceae	1	1
Violaceae	1	3



Vitaceae	1	1
Xanthorrhoeaceae	1	1
Zamiaceae	1	1
Zygophyllaceae	1	3
<b>TOTAL</b>	<b>287</b>	<b>540</b>

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
<b>Aizoaceae</b>				
1.	2795 <i>Carpobrotus edulis</i> (Hottentot Fig)	Y		
2.	2813 <i>Mesembryanthemum crystallinum</i> (Iceplant)	Y		
3.	2820 <i>Tetragonia decumbens</i> (Sea Spinach)	Y		
<b>Amaranthaceae</b>				
4.	2668 <i>Amaranthus powellii</i> (Powell's Amaranth)	Y		
5.	2751 <i>Ptilotus polystachyus</i> (Prince of Wales Feather)			
6.	15856 <i>Ptilotus sericostachyus</i> subsp. <i>sericostachyus</i>			
<b>Amaryllidaceae</b>				
7.	44860 <i>Pancratium maritimum</i>	Y		Y
<b>Anarthriaceae</b>				
8.	1097 <i>Lyginia barbata</i>			
<b>Apiaceae</b>				
9.	6210 <i>Apium annum</i>			
10.	6211 <i>Apium prostratum</i> (Sea Celery)			
11.	6218 <i>Daucus glochidiatus</i> (Australian Carrot)			
12.	6221 <i>Foeniculum vulgare</i> (Fennel)	Y		
13.	6289 <i>Xanthosia huegelii</i>			
<b>Araliaceae</b>				
14.	6280 <i>Trachymene pilosa</i> (Native Parsnip)			
<b>Asparagaceae</b>				
15.	1208 <i>Acanthocarpus preissii</i>			
16.	1287 <i>Dichopogon capillipes</i>			
17.	1370 <i>Lachenalia reflexa</i>	Y		
18.	1231 <i>Lomandra maritima</i>			
19.	1239 <i>Lomandra preissii</i>			
20.	1372 <i>Ornithogalum arabicum</i> (Lesser Cape Lily)	Y		
21.	1312 <i>Sowerbaea laxiflora</i> (Purple Tassels)			
22.	1319 <i>Thysanotus arenarius</i>			
<b>Asphodelaceae</b>				
23.	1364 <i>Asphodelus fistulosus</i> (Onion Weed)	Y		
24.	1368 <i>Trachyandra divaricata</i>	Y		
<b>Asteraceae</b>				
25.	7838 <i>Arctotheca calendula</i> (Cape Weed, African Marigold)	Y		
26.	7851 <i>Asteridea pulverulenta</i> (Common Bristle Daisy)			
27.	7911 <i>Carthamus lanatus</i> (Saffron Thistle)	Y		
28.	7915 <i>Centaurea calcitrapa</i> (Star Thistle)	Y		
29.	7916 <i>Centaurea melitensis</i> (Maltese Cockspur, Malta Thistle)	Y		
30.	7939 <i>Conyza bonariensis</i> (Flaxleaf Fleabane)	Y		
31.	20074 <i>Conyza sumatrensis</i>	Y		
32.	7976 <i>Galinsoga parviflora</i> (Potato Weed)	Y		
33.	12624 <i>Gnephosis angianthoides</i>			
34.	12741 <i>Hyalosperma cotula</i>			
35.	8086 <i>Hypochoeris glabra</i> (Smooth Catsear)	Y		
36.	8106 <i>Millotia tenuifolia</i> (Soft Millotia)			
37.	8127 <i>Olearia axillaris</i> (Coastal Daisybush)			
38.	8149 <i>Olearia rudis</i> (Rough Daisybush)			
39.	42281 <i>Pithocarpa cordata</i>			
40.	20161 <i>Senecio pinnatifolius</i>			
41.	25884 <i>Senecio pinnatifolius</i> var. <i>latilobus</i>			
42.	8220 <i>Senecio vulgaris</i> (Common Groundsel)	Y		
43.	8230 <i>Sonchus asper</i> (Rough Sowthistle)	Y		
44.	9367 <i>Sonchus hydrophilus</i> (Native Sowthistle)			
45.	8231 <i>Sonchus oleraceus</i> (Common Sowthistle)	Y		
46.	8254 <i>Urospermum picroides</i> (False Hawkbit)	Y		
47.	8257 <i>Vellereophyton dealbatum</i> (White Cudweed)	Y		
<b>Brassicaceae</b>				
48.	3000 <i>Brassica tournefortii</i> (Mediterranean Turnip)	Y		
49.	2995 <i>Brassica x napus</i>	Y		
50.	3011 <i>Diplotaxis muralis</i> (Wall Rocket)	Y		
51.	3016 <i>Heliophila pusilla</i>	Y		
<b>Bryaceae</b>				

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52.	44608 <i>Rosulabryum billardieri</i>			
<b>Campanulaceae</b>				
53.	7384 <i>Wahlenbergia capensis</i> (Cape Bluebell)	Y		
<b>Caprifoliaceae</b>				
54.	7368 <i>Scabiosa atropurpurea</i> (Purple Pincushion)	Y		
<b>Caryophyllaceae</b>				
55.	19883 <i>Arenaria leptoclados</i>	Y		
56.	2889 <i>Cerastium glomeratum</i> (Mouse Ear Chickweed)	Y		
57.	19825 <i>Petrorhagia dubia</i>	Y		
58.	2908 <i>Sagina maritima</i>	Y		
59.	2909 <i>Silene gallica</i> (French Catchfly)	Y		
60.	2918 <i>Stellaria media</i> (Chickweed)	Y		
<b>Casuarinaceae</b>				
61.	1732 <i>Allocasuarina humilis</i> (Dwarf Sheoak)			
<b>Chenopodiaceae</b>				
62.	2452 <i>Atriplex cinerea</i> (Grey Saltbush)			
63.	2483 <i>Chenopodium album</i> (Fat Hen)	Y		
64.	2578 <i>Rhagodia baccata</i> (Berry Saltbush)			
65.	11341 <i>Rhagodia baccata</i> subsp. <i>baccata</i>			
66.	48430 <i>Salicornia quinqueflora</i>			
67.	2639 <i>Suaeda australis</i> (Sealite)			
68.	2644 <i>Threlkeldia diffusa</i> (Coast Bonefruit)			
<b>Convolvulaceae</b>				
69.	6611 <i>Convolvulus arvensis</i> (Field Bindweed)	Y		
70.	6658 <i>Wilsonia backhousei</i> (Narrow-leaf Wilsonia)			
71.	6659 <i>Wilsonia humilis</i> (Silky Wilsonia)			
<b>Crassulaceae</b>				
72.	3137 <i>Crassula colorata</i> (Dense Stonecrop)			
73.	3140 <i>Crassula glomerata</i>	Y		
74.	3142 <i>Crassula natans</i>	Y		
<b>Cupressaceae</b>				
75.	96 <i>Callitris preissii</i> (Rottnest Island Pine, Maro)			
<b>Cymodoceaceae</b>				
76.	126 <i>Amphibolis antarctica</i> (Sea Nymph)			
77.	127 <i>Amphibolis griffithii</i>			
<b>Cyperaceae</b>				
78.	743 <i>Baumea juncea</i> (Bare Twigrush)			
79.	907 <i>Gahnia trifida</i> (Coast Saw-sedge)			
80.	910 <i>Isolepis cernua</i> (Nodding Club-rush)			
81.	925 <i>Lepidosperma angustatum</i>			
82.	940 <i>Lepidosperma pubisquamum</i>			
83.	29150 <i>Lepidosperma</i> sp. Margaret River (B.J. Lepschi 1841)			
84.	945 <i>Lepidosperma squamatum</i>			
85.	955 <i>Mesomelaena pseudostygia</i>			
86.	992 <i>Schoenus grandiflorus</i> (Large Flowered Bogrush)			
87.	1036 <i>Tetraria octandra</i>			
<b>Dilleniaceae</b>				
88.	5135 <i>Hibbertia hypericoides</i> (Yellow Buttercups)			
89.	45534 <i>Hibbertia hypericoides</i> subsp. <i>hypericoides</i>			
90.	5162 <i>Hibbertia racemosa</i> (Stalked Guinea Flower)			
91.	11461 <i>Hibbertia spicata</i> subsp. <i>leptotheca</i>			P3
<b>Droseraceae</b>				
92.	3095 <i>Drosera erythrorhiza</i> (Red Ink Sundew)			
93.	3118 <i>Drosera pallida</i> (Pale Rainbow)			
<b>Ericaceae</b>				
94.	6427 <i>Leucopogon parviflorus</i> (Coast Beard-heath)			
95.	6436 <i>Leucopogon propinquus</i>			
<b>Euphorbiaceae</b>				
96.	4582 <i>Adriana quadripartita</i> (Bitter Bush)			
97.	29940 <i>Euphorbia maculata</i>	Y		
98.	4636 <i>Euphorbia paralias</i> (Sea Spurge)	Y		
99.	4638 <i>Euphorbia peplus</i> (Petty Spurge)	Y		

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<b>Fabaceae</b>				
100.	3262 <i>Acacia cochlearis</i> (Rigid Wattle)			
101.	3282 <i>Acacia cyclops</i> (Coastal Wattle)			
102.	3409 <i>Acacia lasiocarpa</i> (Panjang)			
103.	11611 <i>Acacia lasiocarpa</i> var. <i>lasiocarpa</i>			
104.	15481 <i>Acacia pulchella</i> var. <i>glaberrima</i>			
105.	3525 <i>Acacia rostellifera</i> (Summer-scented Wattle)			
106.	3527 <i>Acacia saligna</i> (Orange Wattle, Kudjong)			
107.	30032 <i>Acacia saligna</i> subsp. <i>saligna</i>			
108.	3584 <i>Acacia truncata</i>			
109.	18560 <i>Daviesia divaricata</i> subsp. <i>divaricata</i>			
110.	16585 <i>Daviesia nudiflora</i> subsp. <i>nudiflora</i>			
111.	20475 <i>Gastrolobium capitatum</i>			
112.	20482 <i>Gastrolobium nervosum</i>			
113.	3945 <i>Gompholobium aristatum</i>			
114.	3957 <i>Gompholobium tomentosum</i> (Hairy Yellow Pea)			
115.	3961 <i>Hardenbergia comptoniana</i> (Native Wisteria)			
116.	4037 <i>Kennedia coccinea</i> (Coral Vine)			
117.	4065 <i>Lupinus angustifolius</i> (Narrowleaf Lupin)	Y		
118.	4066 <i>Lupinus cosentinii</i>	Y		
119.	4075 <i>Medicago littoralis</i> (Strand Medic)	Y		
120.	4085 <i>Melilotus indicus</i>	Y		
121.	4256 <i>Templetonia retusa</i> (Cockies Tongues)			
122.	4289 <i>Trifolium angustifolium</i> (Narrowleaf Clover)	Y		
123.	17145 <i>Trifolium angustifolium</i> var. <i>angustifolium</i>	Y		
124.	4292 <i>Trifolium campestre</i> (Hop Clover)	Y		
125.	17763 <i>Trifolium campestre</i> var. <i>campestre</i> (Hop Clover)	Y		
126.	4293 <i>Trifolium cernuum</i> (Drooping Flower Clover)	Y		
127.	4298 <i>Trifolium hirtum</i> (Rose Clover)	Y		
128.	14738 <i>Trifolium resupinatum</i> var. <i>resupinatum</i>	Y		
129.	4315 <i>Trifolium tomentosum</i> (Woolly Clover)	Y		
130.	15509 <i>Trifolium tomentosum</i> var. <i>tomentosum</i>	Y		
131.	11474 <i>Vicia sativa</i> subsp. <i>nigra</i>	Y		
<b>Fissidentaceae</b>				
132.	32369 <i>Fissidens tenellus</i>			
<b>Frankeniaceae</b>				
133.	5209 <i>Frankenia pauciflora</i> (Seaheath)			
<b>Gentianaceae</b>				
134.	6539 <i>Centaurium erythraea</i> (Common Centaury)	Y		
<b>Geraniaceae</b>				
135.	4332 <i>Erodium botrys</i> (Long Storksbill)	Y		
136.	4333 <i>Erodium cicutarium</i> (Common Storksbill)	Y		
137.	4343 <i>Pelargonium capitatum</i> (Rose Pelargonium)	Y		
138.	4346 <i>Pelargonium littorale</i>			
<b>Goodeniaceae</b>				
139.	7580 <i>Lechenaultia linarioides</i> (Yellow Leschenaultia)			
140.	7626 <i>Scaevola nitida</i> (Shining Fanflower)			
141.	13152 <i>Scaevola thesioides</i> subsp. <i>thesioides</i>			
<b>Gyrostemonaceae</b>				
142.	2791 <i>Tersonia cyathiflora</i> (Button Creeper)			
<b>Haemodoraceae</b>				
143.	1418 <i>Conostylis aculeata</i> (Prickly Conostylis)			
144.	1427 <i>Conostylis candicans</i> (Grey Cottonhead)			
145.	11438 <i>Conostylis candicans</i> subsp. <i>candicans</i>			
<b>Haloragaceae</b>				
146.	6161 <i>Gonocarpus pithyoides</i>			
147.	6198 <i>Myriophyllum salsugineum</i>			
<b>Hemerocallidaceae</b>				
148.	1259 <i>Dianella revoluta</i> (Blueberry Lily)			
149.	1260 <i>Stypandra glauca</i> (Blind Grass)			
<b>Iridaceae</b>				
150.	1556 <i>Romulea rosea</i> (Guildford Grass)	Y		
<b>Juncaceae</b>				
151.	11922 <i>Juncus kraussii</i> subsp. <i>australiensis</i>			

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<b>Juncaginaceae</b>				
152.	147 <i>Triglochin mucronata</i>			
<b>Lamiaceae</b>				
153.	6881 <i>Marrubium vulgare</i> (Horehound)	Y		
154.	6929 <i>Salvia verbenaca</i> (Wild Sage)	Y		
<b>Lauraceae</b>				
155.	2951 <i>Cassytha flava</i> (Dodder Laurel)			
156.	2957 <i>Cassytha racemosa</i> (Dodder Laurel)			
<b>Linaceae</b>				
157.	4362 <i>Linum marginale</i> (Wild Flax)			
<b>Loganiaceae</b>				
158.	6515 <i>Logania vaginalis</i> (White Spray)			
<b>Malvaceae</b>				
159.	4906 <i>Alyogyne huegelii</i> (Lilac Hibiscus)			
160.	14646 <i>Lagunaria patersonia</i>	Y		
161.	4958 <i>Lawrenzia spicata</i>			
162.	36480 <i>Malva arborea</i> (Tree Mallow)	Y		
163.	36522 <i>Malva pseudolavatera</i>	Y		
164.	5077 <i>Thomasia cognata</i>			
165.	5105 <i>Thomasia triphylla</i>			
<b>Montiaceae</b>				
166.	2845 <i>Calandrinia brevipedata</i> (Short-stalked Purslane)			
167.	2846 <i>Calandrinia calyptata</i> (Pink Purslane)			
168.	2848 <i>Calandrinia corrigioloides</i> (Strap Purslane)			
<b>Myrtaceae</b>				
169.	35816 <i>Calothamnus quadrifidus</i> subsp. <i>quadrifidus</i>			
170.	17104 <i>Corymbia calophylla</i> (Marri)			
171.	5615 <i>Eucalyptus decipiens</i> (Limestone Marlock, Moit)			
172.	5659 <i>Eucalyptus gomphocephala</i> (Tuart, Duart)			
173.	5825 <i>Hypocalymma robustum</i> (Swan River Myrtle)			
174.	15498 <i>Kunzea glabrescens</i> (Spearwood)			
175.	5850 <i>Leptospermum laevigatum</i> (Coast Teatree)	Y		
176.	5900 <i>Melaleuca cuticularis</i> (Saltwater Paperbark)			
177.	5920 <i>Melaleuca huegelii</i> (Chenille Honey Myrtle)			
178.	13271 <i>Melaleuca huegelii</i> subsp. <i>huegelii</i>			
179.	5922 <i>Melaleuca lanceolata</i> (Rottnest Teatree, Moonah)			
180.	5959 <i>Melaleuca raphiophylla</i> (Swamp Paperbark)			
181.	18598 <i>Melaleuca systema</i>			
182.	5978 <i>Melaleuca teretifolia</i> (Banbar)			
<b>Onagraceae</b>				
183.	6138 <i>Oenothera drummondii</i> (Beach Evening Primrose)	Y		
184.	14292 <i>Oenothera stricta</i> subsp. <i>stricta</i>	Y		
<b>Ophioglossaceae</b>				
185.	12782 <i>Ophioglossum gramineum</i>			
<b>Orchidaceae</b>				
186.	1599 <i>Caladenia latifolia</i> (Pink Fairy Orchid)			
187.	17760 <i>Caladenia nobilis</i>			
188.	10916 <i>Cyrtostylis huegelii</i>			
189.	15418 <i>Leptoceras menziesii</i>			
190.	15426 <i>Pterostylis aspera</i>			
191.	12217 <i>Pterostylis sanguinea</i>			
<b>Orobanchaceae</b>				
192.	7046 <i>Bellardia trixago</i> (Bellardia)	Y		
193.	7122 <i>Orobanche minor</i> (Lesser Broomrape)	Y		
<b>Papaveraceae</b>				
194.	17797 <i>Argemone ochroleuca</i> subsp. <i>ochroleuca</i>	Y		
195.	2969 <i>Fumaria capreolata</i> (Whiteflower Fumitory)	Y		
<b>Phyllanthaceae</b>				
196.	4675 <i>Phyllanthus calycinus</i> (False Boronia)			
<b>Phytolaccaceae</b>				
197.	2793 <i>Phytolacca octandra</i> (Red Ink Plant)	Y		
<b>Pinaceae</b>				
198.	17671 <i>Pinus halepensis</i>			



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199.	88 <i>Pinus radiata</i> (Radiata Pine)	Y		
<b>Plantaginaceae</b>				
200.	7304 <i>Plantago major</i> (Greater Plantain)	Y		
201.	7108 <i>Veronica arvensis</i> (Wall Speedwell)	Y		
<b>Poaceae</b>				
202.	184 <i>Aira caryophylla</i> (Silvery Hairgrass)	Y		
203.	17240 <i>Austrostipa flavescens</i>			
204.	231 <i>Avellinia michelii</i>	Y		
205.	233 <i>Avena barbata</i> (Bearded Oat)	Y		
206.	234 <i>Avena fatua</i> (Wild Oat)	Y		
207.	244 <i>Briza maxima</i> (Blowfly Grass)	Y		
208.	245 <i>Briza minor</i> (Shivery Grass)	Y		
209.	249 <i>Bromus diandrus</i> (Great Brome)	Y		
210.	250 <i>Bromus hordeaceus</i> (Soft Brome)	Y		
211.	41566 <i>Cenchrus longisetus</i> (Feathertop)	Y		
212.	41563 <i>Cenchrus purpureus</i> (Elephant Grass)	Y		
213.	41568 <i>Cenchrus setaceus</i> (Fountain Grass)	Y		
214.	347 <i>Ehrharta calycina</i> (Perennial Veldt Grass)	Y		
215.	349 <i>Ehrharta longiflora</i> (Annual Veldt Grass)	Y		
216.	351 <i>Ehrharta villosa</i> (Pyp Grass)	Y		
217.	20019 <i>Lachnagrostis filiformis</i>			
218.	467 <i>Lagurus ovatus</i> (Hare's Tail Grass)	Y		
219.	478 <i>Lolium rigidum</i> (Wimmera Ryegrass)	Y		
220.	485 <i>Microlaena stipoides</i> (Weeping Grass)			
221.	11494 <i>Phalaris arundinacea</i> var. <i>arundinacea</i>	Y		
222.	571 <i>Poa annua</i> (Winter Grass)	Y		
223.	573 <i>Poa drummondiana</i> (Knotted Poa)			
224.	578 <i>Poa porphyroclados</i>			
225.	582 <i>Polypogon monspeliensis</i> (Annual Beardgrass)	Y		
226.	10970 <i>Rostraria cristata</i>	Y		
227.	603 <i>Secale cereale</i> (Rye)	Y		
228.	624 <i>Spinifex hirsutus</i> (Hairy Spinifex)			
229.	625 <i>Spinifex longifolius</i> (Beach Spinifex)			
230.	627 <i>Spinifex x alterniflorus</i>			
231.	635 <i>Sporobolus virginicus</i> (Marine Couch)			
232.	636 <i>Stenotaphrum secundatum</i> (Buffalo Grass)	Y		
233.	724 <i>Vulpia myuros</i> (Rat's Tail Fescue)	Y		
<b>Polygalaceae</b>				
234.	4552 <i>Comesperma confertum</i>			
235.	4555 <i>Comesperma integerrimum</i>			
<b>Polyphysaceae</b>				
236.	48409 <i>Acetabularia caliculus</i>			
<b>Pottiaceae</b>				
237.	32390 <i>Gymnostomum calcareum</i>			
238.	32437 <i>Syntrichia antarctica</i>			
239.	32438 <i>Syntrichia pagorum</i>			
240.	32439 <i>Syntrichia papillosa</i>			
241.	32450 <i>Trichostomum eckelianum</i>			
<b>Primulaceae</b>				
242.	6483 <i>Samolus junceus</i>			
243.	6484 <i>Samolus repens</i> (Creeping Brookweed)			
<b>Proteaceae</b>				
244.	1819 <i>Banksia grandis</i> (Bull Banksia, Pulgarla)			
245.	32077 <i>Banksia sessilis</i> var. <i>cygnorum</i>			
246.	2054 <i>Grevillea olivacea</i> (Olive Grevillea)		P4	
247.	15839 <i>Grevillea preissii</i> subsp. <i>preissii</i>			
248.	2197 <i>Hakea prostrata</i> (Harsh Hakea)			
249.	2273 <i>Persoonia saccata</i> (Snottygobble)			
250.	20368 <i>Petrophile axillaris</i>			
251.	2309 <i>Petrophile serruriae</i>			
<b>Racopilaceae</b>				
252.	32480 <i>Racopilum cuspidigerum</i> var. <i>convolutaceum</i>			
<b>Ranunculaceae</b>				
253.	10804 <i>Clematis linearifolia</i>			
254.	2932 <i>Ranunculus colonorum</i> (Common Buttercup)			

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<b>Restionaceae</b>				
255.	16595 <i>Desmocladus flexuosus</i>			
256.	1078 <i>Leptocarpus coangustus</i>			
<b>Rhamnaceae</b>				
257.	4802 <i>Cryptandra mutila</i>			
258.	4828 <i>Spyridium globulosum</i> (Basket Bush)			
259.	11665 <i>Trymalium ledifolium</i> var. <i>ledifolium</i>			
<b>Rhodomelaceae</b>				
260.	27002 <i>Laurencia forsteri</i>			
<b>Rubiaceae</b>				
261.	17348 <i>Galium aparine</i> (Goosegrass)	Y		
262.	7323 <i>Galium murale</i> (Small Goosegrass)	Y		
263.	7348 <i>Opercularia hispidula</i> (Hispid Stinkweed)			
<b>Rutaceae</b>				
264.	4454 <i>Diplolaena dampieri</i> (Southern Diplolaena)			
<b>Santalaceae</b>				
265.	10765 <i>Exocarpos sparteus</i> (Broom Ballart, Djuk)			
266.	2356 <i>Santalum acuminatum</i> (Quandong, Warnga)			
<b>Sapindaceae</b>				
267.	4763 <i>Dodonaea hackettiana</i> (Hackett's Hopbush)		P4	
<b>Scrophulariaceae</b>				
268.	7054 <i>Dischisma arenarium</i>	Y		
269.	7215 <i>Eremophila glabra</i> (Tar Bush)			
270.	17175 <i>Eremophila glabra</i> subsp. <i>albicans</i>			
<b>Solanaceae</b>				
271.	6968 <i>Lycium ferocissimum</i> (African Boxthorn)	Y		
272.	6974 <i>Nicotiana glauca</i> (Tree Tobacco)	Y		
273.	47240 <i>Petunia x atkinsiana</i>	Y		
274.	6984 <i>Physalis philadelphica</i> (Tomatillo)	Y		Y
275.	7022 <i>Solanum nigrum</i> (Black Berry Nightshade)	Y		
276.	7025 <i>Solanum oldfieldii</i>			
277.	7037 <i>Solanum symonii</i>			
<b>Stylidiaceae</b>				
278.	7694 <i>Stylidium bulbiferum</i> (Circus Triggerplant)			
279.	7785 <i>Stylidium repens</i> (Matted Triggerplant)			
<b>Thymelaeaceae</b>				
280.	5237 <i>Pimelea calcicola</i>		P3	
281.	18117 <i>Pimelea rosea</i> subsp. <i>rosea</i>			
<b>Urticaceae</b>				
282.	1767 <i>Urtica urens</i> (Small Nettle)	Y		
<b>Violaceae</b>				
283.	5216 <i>Hybanthus calycinus</i> (Wild Violet)			
<b>Vitaceae</b>				
284.	34481 <i>Parthenocissus quinquefolia</i>	Y		
<b>Xanthorrhoeaceae</b>				
285.	1256 <i>Xanthorrhoea preissii</i> (Grass tree, Palga)			
<b>Zamiaceae</b>				
286.	85 <i>Macrozamia riedlei</i> (Zamia, Djiridji)			
<b>Zygophyllaceae</b>				
287.	4383 <i>Tribulus terrestris</i> (Caltrop)	Y		

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

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

# Fauna Woodman Point 5km

Created By Guest user on 20/08/2019

Current Names Only Yes  
Core Datasets Only Yes  
Species Group All Animals  
Method 'By Circle'  
Centre 115° 45' 45" E, 32° 07' 44" S  
Buffer 5km  
Group By Species Group

Species Group	Species	Records
Amphibian	4	25
Bird	172	6252
Fish	62	100
Invertebrate	52	207
Mammal	11	92
Reptile	35	299
<b>TOTAL</b>	<b>336</b>	<b>6975</b>

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
<b>Amphibian</b>				
1.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
2.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
3.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
4.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
<b>Bird</b>				
5.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
6.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
7.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
8.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
9.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
10.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
11.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
12.	24312 <i>Anas gracilis</i> (Grey Teal)			
13.	24313 <i>Anas platyrhynchos</i> (Mallard)			
14.	<i>Anas platyrhynchos</i> subsp. <i>domesticus</i>			
15.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
16.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
17.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
18.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
19.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
20.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
21.	41324 <i>Ardea modesta</i> (great egret, white egret)			
22.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
23.	41326 <i>Ardenna carneipes</i> (Flesh-footed Shearwater, Fleishy-footed Shearwater)		T	
24.	48573 <i>Ardenna pacifica</i> (Wedge-tailed Shearwater)		IA	
25.	25736 <i>Arenaria interpres</i> (Ruddy Turnstone)		IA	
26.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
27.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
28.	24318 <i>Aythya australis</i> (Hardhead)			
29.	<i>Barnardius zonarius</i>			
30.	24319 <i>Biziura lobata</i> (Musk Duck)			
31.	25714 <i>Cacatua pastinator</i> (Western Long-billed Corella)			
32.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
33.	24729 <i>Cacatua tenuirostris</i> (Eastern Long-billed Corella)	Y		
34.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
35.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
36.	24780 <i>Calidris alba</i> (Sanderling)		IA	
37.	25738 <i>Calidris canutus</i> (Red Knot, knot)		IA	
38.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
39.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
40.	24790 <i>Calidris tenuirostris</i> (Great Knot)		IA	
41.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)		T	
42.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black Cockatoo)		T	
43.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)		T	
44.	48400 <i>Calyptorhynchus</i> sp. (white-tailed black cockatoo)		T	
45.	25575 <i>Charadrius leschenaultii</i> (Greater Sand Plover)		T	
46.	25576 <i>Charadrius mongolus</i> (Lesser Sand Plover)		T	
47.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
48.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
49.	<i>Chroicocephalus novaehollandiae</i>			
50.	24432 <i>Chrysococcyx lucidus</i> subsp. <i>plagosus</i> (Shining Bronze Cuckoo)			
51.	24288 <i>Circus approximans</i> (Swamp Harrier)			
52.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
53.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
54.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
55.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
56.	24416 <i>Corvus bennetti</i> (Little Crow)			
57.	25592 <i>Corvus coronoides</i> (Australian Raven)			
58.	24417 <i>Corvus coronoides</i> subsp. <i>perplexus</i> (Australian Raven)			
59.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			
60.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
61.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
62.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
63.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
64.	24322 <i>Cygnus atratus</i> (Black Swan)			
65.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
66.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
67.	24687 <i>Daption capense</i> (Cape Petrel)			
68.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
69.	30836 <i>Diomedea exulans</i> subsp. <i>exulans</i> (Snowy Albatross)		T	
70.	<i>Egretta garzetta</i>			
71.	<i>Egretta novaehollandiae</i>			
72.	<i>Elanus axillaris</i>			
73.	47937 <i>Elsayornis melanops</i> (Black-fronted Dotterel)			
74.	<i>Eolophus roseicapillus</i>			
75.	24379 <i>Erythronyx cinctus</i> (Red-kneed Dotterel)			
76.	25746 <i>Eudyptula minor</i> (Little Penguin)			
77.	24818 <i>Eudyptula minor</i> subsp. <i>novaehollandiae</i> (Little Penguin)			
78.	25621 <i>Falco berigora</i> (Brown Falcon)			
79.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
80.	25623 <i>Falco longipennis</i> (Australian Hobby)			
81.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
82.	25727 <i>Fulica atra</i> (Eurasian Coot)			
83.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
84.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
85.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
86.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
87.	25627 <i>Haematopus fuliginosus</i> (Sooty Oystercatcher)			
88.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			
89.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
90.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
91.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
92.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
93.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
94.	48587 <i>Hydroprogne caspia</i> (Caspian Tern)		IA	
95.	25638 <i>Larus pacificus</i> (Pacific Gull)			
96.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
97.	30932 <i>Limosa lapponica</i> (Bar-tailed Godwit)		IA	
98.	24690 <i>Macronectes giganteus</i> (Southern Giant Petrel)		IA	
99.	24691 <i>Macronectes halli</i> (Northern Giant Petrel)		IA	
100.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
101.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
102.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
103.	<i>Microcarbo melanoleucos</i>			
104.	48008 <i>Morus serrator</i> (Australasian Gannet)			
105.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
106.	24739 <i>Neophema petrophila</i> (Rock Parrot)			
107.	24798 <i>Numenius madagascariensis</i> (Eastern Curlew)		T	

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
108.	25742 <i>Numenius phaeopus</i> (Whimbrel)		IA	
109.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
110.	24497 <i>Oceanites oceanicus</i> (Wilson's Storm-petrel)		IA	
111.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
112.	41347 <i>Onychoprion anaethetus</i> (Bridled Tern)		IA	
113.	24328 <i>Oxyura australis</i> (Blue-billed Duck)		P4	
114.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
115.	25707 <i>Pachyptila salvini</i> (Salvin's Prion)			
116.	24696 <i>Pachyptila turtur</i> (Fairy Prion)			
117.	48591 <i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
118.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
119.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
120.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
121.	48060 <i>Petrochelidon ariel</i> (Fairy Martin)			
122.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
123.	48066 <i>Petroica boodang</i> (Scarlet Robin)			
124.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
125.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
126.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
127.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
128.	25587 <i>Phaps elegans</i> (Brush Bronzewing)			
129.	48071 <i>Phylidonyris niger</i> (White-cheeked Honeyeater)			
130.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
131.	24841 <i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
132.	25720 <i>Platycercus icterotis</i> (Western Rosella)			
133.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
134.	24382 <i>Pluvialis fulva</i> (Pacific Golden Plover)		IA	
135.	24383 <i>Pluvialis squatarola</i> (Grey Plover)		IA	
136.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
137.	24681 <i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
138.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
139.	24771 <i>Porzana tabuensis</i> (Spotless Crane)			
140.	25711 <i>Pterodroma mollis</i> (Soft-plumaged Petrel)			
141.	24711 <i>Puffinus assimilis</i> subsp. <i>assimilis</i> (Little Shearwater)			
142.	<i>Purpureicephalus spurius</i>			
143.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
144.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
145.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
146.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
147.	24279 <i>Sericornis frontalis</i> subsp. <i>maculatus</i> (White-browed Scrubwren)			
148.	30948 <i>Smicronis brevirostris</i> (Weebill)			
149.	48116 <i>Stercorarius antarcticus</i> (Brown Skua)		P4	
150.	24517 <i>Stercorarius parasiticus</i> (Arctic jaeger, Arctic Skua)		IA	
151.	24518 <i>Stercorarius pomarinus</i> (Pomarine Jaeger, Pomarine Skua)		IA	
152.	25640 <i>Sterna dougallii</i> (Roseate Tern)		IA	
153.	25642 <i>Sterna hirundo</i> (Common Tern)		IA	
154.	24526 <i>Sterna hirundo</i> subsp. <i>hirundo</i> (Common Tern)		IA	Y
155.	48593 <i>Sternula albifrons</i> (Little Tern)		IA	
156.	48594 <i>Sternula nereis</i> (Fairy Tern)			
157.	25589 <i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
158.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
159.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
160.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
161.	44607 <i>Thalassarche melanophris</i> (Black-browed Albatross)		T	
162.	48597 <i>Thalasseus bergii</i> (Crested Tern)		IA	
163.	48135 <i>Thinornis rubricollis</i> (Hooded Plover, Hooded Dotterel)		P4	
164.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
165.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
166.	25723 <i>Trichoglossus haematodus</i> (Rainbow Lorikeet)			
167.	24754 <i>Trichoglossus haematodus</i> subsp. <i>rubitorquis</i> (Red-collared Lorikeet)			
168.	24803 <i>Tringa brevipes</i> (Grey-tailed Tattler)		P4	
169.	24808 <i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	
170.	24809 <i>Tringa stagnatilis</i> (Marsh Sandpiper, little greenshank)		IA	
171.	48147 <i>Turnix varius</i> (Painted Button-quail)			
172.	24851 <i>Turnix velox</i> (Little Button-quail)			
173.	24855 <i>Tyto novaehollandiae</i> subsp. <i>novaehollandiae</i> (Masked Owl (southwest))		P3	
174.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
175.	41351 <i>Xenus cinereus</i> (Terek Sandpiper)		IA	
176.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			



Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
<b>Fish</b>				
177.	? ?			
178.	<i>Acanthaluteres brownii</i>			
179.	<i>Acanthaluteres spilomelanurus</i>			
180.	<i>Acanthaluteres vittiger</i>			
181.	<i>Afurcagobius suppositus</i>			
182.	<i>Anoplocapros lenticularis</i>			
183.	<i>Anoplocapros robustus</i>			
184.	<i>Aploactisoma milesii</i>			
185.	<i>Apogon rueppellii</i>			
186.	<i>Apogon victoriae</i>			
187.	<i>Aracana aurita</i>			
188.	<i>Arripis georgiana</i>			
189.	<i>Callogobius mucosus</i>			
190.	34031 <i>Carcharodon carcharias</i> (Great White Shark)		T	
191.	<i>Cleidopus gloriamaris</i>			
192.	<i>Cochleoceps spatula</i>			
193.	<i>Colurodontis paxmani</i>			
194.	<i>Contusus breviceaudus</i>			
195.	<i>Cristiceps australis</i>			
196.	<i>Cristiceps</i> sp.			
197.	<i>Dactylopus dactylopus</i>			
198.	<i>Diodon nichthemerus</i>			
199.	<i>Elops hawaiiensis</i>			
200.	<i>Epinephelus</i> sp.			
201.	<i>Fistularia petimba</i>			
202.	<i>Girella zebra</i>			
203.	<i>Gonorynchus greyi</i>			
204.	<i>Gymnapistes marmoratus</i>			
205.	<i>Haletta semifasciata</i>			
206.	<i>Heteroclinus adelaidae</i>			
207.	<i>Hippocampus elongatus</i>			
208.	<i>Histiogamphelus cristatus</i>			
209.	<i>Histrio histrio</i>			
210.	<i>Hypnos monopterygium</i>			
211.	<i>Ichthyoscopus barbatus</i>			
212.	<i>Idiotropiscis australe?</i>			
213.	<i>Maxillcosta scabriceps</i>			
214.	<i>Meuschenia flavolineata</i>			
215.	<i>Meuschenia freycineti</i>			
216.	<i>Meuschenia hippocrepis</i>			
217.	<i>Microcanthus strigatus</i>			
218.	<i>Paraploactis intonsa</i>			
219.	<i>Perryena leucometopon</i>			
220.	<i>Petrosirtes breviceps</i>			
221.	<i>Phyllophryne</i> sp.			
222.	<i>Platax teira</i>			
223.	<i>Platycephalus</i> sp.			
224.	<i>Plotosus lineatus</i>			
225.	<i>Pomatomus saltatrix</i>			
226.	<i>Pterois antennata</i>			
227.	<i>Pterygotrigla polyommata</i>			
228.	<i>Rhycherus gloveri</i>			
229.	<i>Scobinichthys granulatus</i>			
230.	<i>Scorpaena papillosa</i>			
231.	<i>Scorpius georgianus</i>			
232.	<i>Siganus fuscescens</i>			
233.	<i>Sillago</i> sp.			
234.	<i>Siphamia cuneiceps</i>			
235.	<i>Solegnathus lettiensis</i>			
236.	<i>Stigmatopora argus</i>			
237.	<i>Strongylura leiura</i>			
238.	<i>Torquigener pleurogramma</i>			
<b>Invertebrate</b>				
239.	<i>Aname mainae</i>			
240.	<i>Anoplodactylus pycnosoma</i>			Y
241.	<i>Araneus senicaudatus</i>			
242.	<i>Argiope trifasciata</i>			
243.	<i>Artema atlanta</i>			
244.	<i>Artoria linnaei</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
245.	<i>Arteria taeniifera</i>			
246.	<i>Austracantha minax</i>			
247.	<i>Badumna insignis</i>			
248.	<i>Cercophonius sulcatus</i>			
249.	<i>Cherax destructor</i>			
250.	<i>Cherax sp.</i>			
251.	<i>Cormocephalus aurantiipes</i>			
252.	<i>Cryptoerithus quobba</i>			
253.	<i>Cyclosa trilobata</i>			
254.	<i>Delena cancerides</i>			
255.	<i>Dingosa serrata</i>			
256.	<i>Eriophora biapicata</i>			
257.	<i>Ero aphana</i>			
258.	<i>Erythrarcus decoris</i>			
259.	<i>Geogarypus taylori</i>			
260.	<i>Hasarius adansoni</i>			
261.	<i>Holasteron aspinosum</i>			
262.	<i>Idiommata blackwalli</i>			
263.	48935 <i>Idiosoma sigillatum</i> (Swan Coastal Plain shield-backed trapdoor spider)		P3	
264.	<i>Isopeda leishmanni</i>			
265.	<i>Lampona brevipes</i>			
266.	<i>Lampona cylindrata</i>			
267.	<i>Latrodectus hasseltii</i>			
268.	<i>Longepi woodman</i>			
269.	<i>Lycosa australicola</i>			
270.	<i>Lycosa lacertosa</i>			
271.	<i>Maratus pavonis</i>			
272.	<i>Missulena granulosa</i>			
273.	<i>Mituliodon tarantulinus</i>			
274.	<i>Molycris vokes</i>			
275.	<i>Myandra bicincta</i>			
276.	<i>Nephila edulis</i>			
277.	<i>Oecobius navus</i>			
278.	<i>Phenasteron longiconductor</i>			
279.	<i>Pinkfloydia harveii</i>			
280.	<i>Pseudolampona woodman</i>			
281.	<i>Pycnothea flynni</i>			
282.	<i>Raveniella arenacea</i>			
283.	<i>Raveniella peckorum</i>			
284.	<i>Raveniella subcirrata</i>			
285.	<i>Smeringopus natalensis</i>			
286.	<i>Supunna funerea</i>			
287.	<i>Supunna picta</i>			
288.	<i>Venator immansueta</i>			
289.	34113 <i>Westralunio carteri</i> (Carter's Freshwater Mussel)		T	
290.	<i>Westrarchaea sinuosa</i>			

**Mammal**

291.	47713 <i>Austronomus australis</i> (White-striped Free-tailed Bat)			
292.	24072 <i>Caperea marginata</i> (Pygmy Right Whale)			
293.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattled Bat)			
294.	24041 <i>Felis catus</i> (Cat)	Y		
295.	24215 <i>Hydromys chrysogaster</i> (Water-rat, Rakali)		P4	
296.	48588 <i>Isoodon fusciventer</i> (Quenda, southwestern brown bandicoot)		P4	
297.	24223 <i>Mus musculus</i> (House Mouse)	Y		
298.	24042 <i>Mustela putorius</i> (European Polecat, Ferret)	Y		
299.	24210 <i>Neophoca cinerea</i> (Australian Sea-lion)		T	
300.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			
301.	24245 <i>Rattus rattus</i> (Black Rat)	Y		

**Reptile**

302.	24991 <i>Aprasia repens</i> (Sand-plain Worm-lizard)			
303.	42381 <i>Brachyurophis semifasciatus</i> (Southern Shovel-nosed Snake)			
304.	25335 <i>Caretta caretta</i> (Loggerhead Turtle)		T	
305.	24980 <i>Christinus marmoratus</i> (Marbled Gecko)			
306.	30893 <i>Cryptoblepharus buchananii</i>			
307.	25027 <i>Ctenotus australis</i>			
308.	25039 <i>Ctenotus fallens</i>			
309.	25766 <i>Delma fraseri</i> (Fraser's Legless Lizard)			
310.	25346 <i>Dermochelys coriacea</i> (Leatherback Turtle)		T	
311.	25096 <i>Egernia kingii</i> (King's Skink)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
312.	25119 <i>Hemiergis quadrilineata</i>			
313.	24961 <i>Heteronotia binoei</i> (Bynoe's Gecko)			
314.	25366 <i>Hydrophis elegans</i> (Elegant Seasnake, Bar-bellied Seasnake)			
315.	42410 <i>Hydrophis ornatus</i> (Ornate Reef Seasnake, Sea Snake)			
316.	43384 <i>Hydrophis platurus</i> (Yellow-bellied Seasnake)			
317.	25128 <i>Lerista christinae</i>			
318.	25133 <i>Lerista elegans</i>			
319.	25147 <i>Lerista lineata</i> (Perth Slider, Lined Skink)		P3	
320.	25005 <i>Lialis burtonis</i>			
321.	25184 <i>Menetia greyii</i>			
322.	25191 <i>Morethia lineocellata</i>			
323.	25192 <i>Morethia obscura</i>			
324.	25248 <i>Neelaps bimaculatus</i> (Black-naped Snake)			
325.	25249 <i>Neelaps calonotos</i> (Black-striped Snake, black-striped burrowing snake)		P3	
326.	25510 <i>Pogona minor</i> (Dwarf Bearded Dragon)			
327.	24907 <i>Pogona minor subsp. minor</i> (Dwarf Bearded Dragon)			
328.	25511 <i>Pseudonaja affinis</i> (Dugite)			
329.	25259 <i>Pseudonaja affinis subsp. affinis</i> (Dugite)			
330.	25266 <i>Simoselaps bertholdi</i> (Jan's Banded Snake)			
331.	25518 <i>Strophurus spinigerus</i>			
332.	24942 <i>Strophurus spinigerus subsp. spinigerus</i>			
333.	24946 <i>Strophurus strophurus</i>			
334.	25203 <i>Tiliqua occipitalis</i> (Western Bluetongue)			
335.	25519 <i>Tiliqua rugosa</i>			
336.	25207 <i>Tiliqua rugosa subsp. rugosa</i>			

**Conservation Codes**

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

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



# EPBC Act Protected Matters Report

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

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

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

Report created: 19/08/19 15:43:15

[Summary](#)

[Details](#)

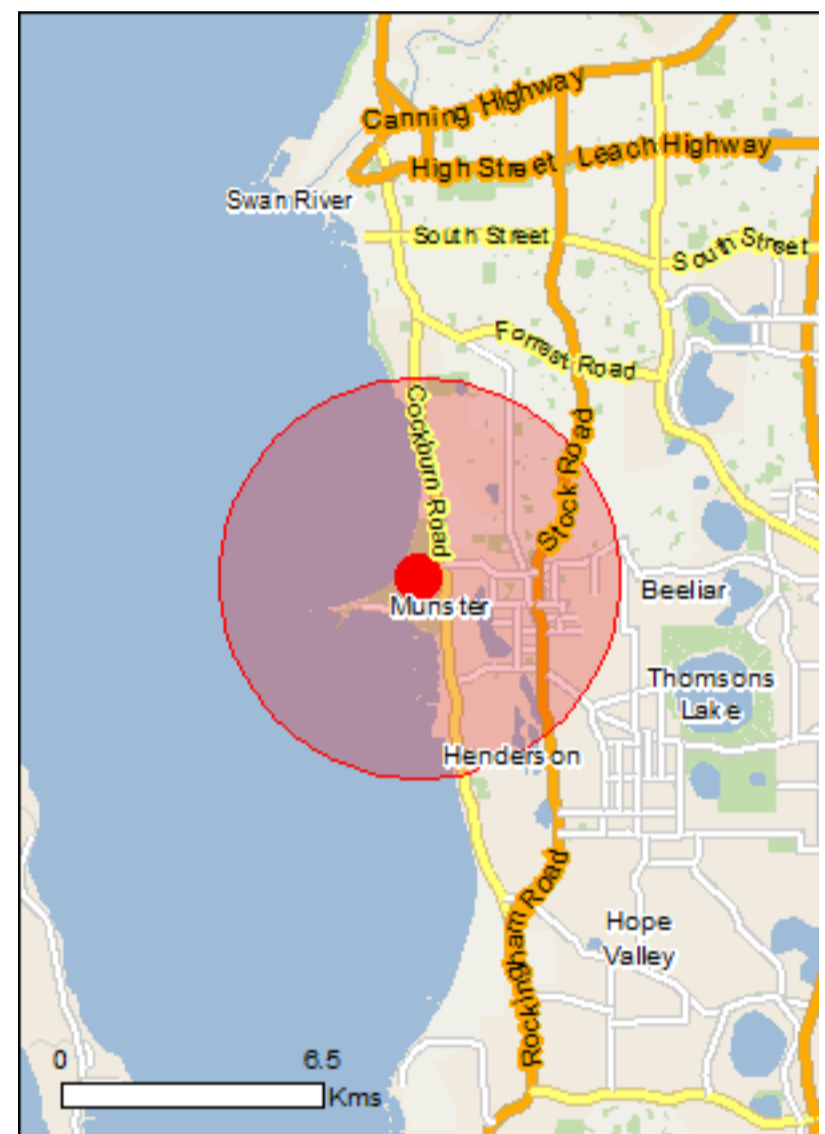
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

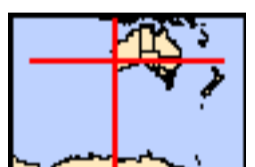
[Acknowledgements](#)



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

[Coordinates](#)

Buffer: 5.0Km



# Summary

## Matters of National Environmental Significance

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

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	1
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	2
<a href="#">Listed Threatened Species:</a>	48
<a href="#">Listed Migratory Species:</a>	54

## Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Land:</a>	1
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	84
<a href="#">Whales and Other Cetaceans:</a>	12
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	4
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	40
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

### Wetlands of International Importance (Ramsar)

[\[ Resource Information \]](#)

Name	Proximity
<a href="#">Forrestdale and thomsons lakes</a>	Within 10km of Ramsar

### Listed Threatened Ecological Communities

[\[ Resource Information \]](#)

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

Name	Status	Type of Presence
<a href="#">Banksia Woodlands of the Swan Coastal Plain ecological community</a>	Endangered	Community likely to occur within area
<a href="#">Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community</a>	Critically Endangered	Community likely to occur within area

### Listed Threatened Species

[\[ Resource Information \]](#)

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



Name	Status	Type of Presence
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Halobaena caerulea</a> Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Limosa lapponica baueri</a> Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Limosa lapponica menzbieri</a> Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Pachyptila turtur subantarctica</a> Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Pterodroma mollis</a> Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
<a href="#">Rostratula australis</a> Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
<a href="#">Thalassarche carteri</a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
<a href="#">Thalassarche cauta cauta</a> Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Name	Status	Type of Presence
<a href="#">Thalassarche cauta steadi</a> White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Breeding known to occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Neophoca cinerea</a> Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Pseudocheirus occidentalis</a> Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area
<b>Plants</b>		
<a href="#">Caladenia huegelii</a> King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area
<a href="#">Diuris micrantha</a> Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Diuris purdiei</a> Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area
<a href="#">Drakaea elastica</a> Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
<a href="#">Drakaea micrantha</a> Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area
<b>Reptiles</b>		
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known

Name	Status	Type of Presence to occur within area
<b>Sharks</b>		
<a href="#">Carcharias taurus (west coast population)</a> Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
<b>Listed Migratory Species</b>		<a href="#">[ Resource Information ]</a>
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat likely to occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardenna carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Hydroprogne caspia</a> Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Onychoprion anaethetus</a> Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Sterna dougallii</a> Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
<a href="#">Thalassarche carteri</a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
<a href="#">Thalassarche cauta</a> Tasmanian Shy Albatross [89224]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<b>Migratory Marine Species</b>		
<a href="#">Balaena glacialis australis</a> Southern Right Whale [75529]	Endangered*	Breeding known to occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Caperea marginata</a> Pygmy Right Whale [39]		Species or species habitat may occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Lamna nasus</a> Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
<a href="#">Manta alfredi</a> Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
<a href="#">Manta birostris</a> Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area



Name	Threatened	Type of Presence
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area
<a href="#">Arenaria interpres</a> Ruddy Turnstone [872]		Species or species habitat known to occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
<a href="#">Calidris alba</a> Sanderling [875]		Species or species habitat known to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
<a href="#">Calidris ruficollis</a> Red-necked Stint [860]		Species or species habitat known to occur within area
<a href="#">Calidris tenuirostris</a> Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Charadrius mongolus</a> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
<a href="#">Limicola falcinellus</a> Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Numenius phaeopus</a> Whimbrel [849]		Species or species habitat known to occur

Name	Threatened	Type of Presence within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat known to occur within area
<a href="#">Pluvialis squatarola</a> Grey Plover [865]		Species or species habitat known to occur within area
<a href="#">Tringa brevipes</a> Grey-tailed Tattler [851]		Species or species habitat known to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
<a href="#">Xenus cinereus</a> Terek Sandpiper [59300]		Species or species habitat known to occur within area

## Other Matters Protected by the EPBC Act

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

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

Name
Commonwealth Land -

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

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

Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat likely to occur within area
<a href="#">Anous tenuirostris melanops</a> Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Breeding known to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Arenaria interpres</a> Ruddy Turnstone [872]		Species or species habitat known to occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
<a href="#">Calidris alba</a> Sanderling [875]		Species or species



Name	Threatened	Type of Presence
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	habitat known to occur within area Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
<a href="#">Calidris ruficollis</a> Red-necked Stint [860]		Species or species habitat known to occur within area
<a href="#">Calidris tenuirostris</a> Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Catharacta skua</a> Great Skua [59472]		Species or species habitat may occur within area
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Charadrius mongolus</a> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
<a href="#">Charadrius ruficapillus</a> Red-capped Plover [881]		Species or species habitat known to occur within area
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
<a href="#">Halobaena caerulea</a> Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
<a href="#">Heteroscelus brevipes</a> Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
<a href="#">Larus pacificus</a> Pacific Gull [811]		Foraging, feeding or related behaviour may

Name	Threatened	Type of Presence
<a href="#">Limicola falcinellus</a> Broad-billed Sandpiper [842]		occur within area  Species or species habitat known to occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Numenius phaeopus</a> Whimbrel [849]		Species or species habitat known to occur within area
<a href="#">Pachyptila turtur</a> Fairy Prion [1066]		Species or species habitat known to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat known to occur within area
<a href="#">Pluvialis squatarola</a> Grey Plover [865]		Species or species habitat known to occur within area
<a href="#">Pterodroma mollis</a> Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
<a href="#">Puffinus assimilis</a> Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area
<a href="#">Puffinus carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
<a href="#">Recurvirostra novaehollandiae</a> Red-necked Avocet [871]		Species or species habitat known to occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
<a href="#">Sterna anaethetus</a> Bridled Tern [814]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Sterna caspia</a> Caspian Tern [59467]		Foraging, feeding or related behaviour known to occur within area

Name	Threatened	Type of Presence
<a href="#">Sterna dougallii</a> Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche carteri</a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
<a href="#">Thalassarche cauta</a> Tasmanian Shy Albatross [89224]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thinornis rubricollis</a> Hooded Plover [59510]		Species or species habitat known to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
<a href="#">Xenus cinereus</a> Terek Sandpiper [59300]		Species or species habitat known to occur within area
<b>Fish</b>		
<a href="#">Acentronura australe</a> Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
<a href="#">Campichthys galei</a> Gale's Pipefish [66191]		Species or species habitat may occur within area
<a href="#">Heraldia nocturna</a> Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
<a href="#">Hippocampus angustus</a> Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
<a href="#">Hippocampus breviceps</a> Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
<a href="#">Hippocampus subelongatus</a> West Australian Seahorse [66722]		Species or species habitat may occur within area
<a href="#">Histiogamphelus cristatus</a> Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
<a href="#">Lissocampus caudalis</a> Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
<a href="#">Lissocampus fatiloquus</a> Prophet's Pipefish [66250]		Species or species habitat may occur within area



Name	Threatened	Type of Presence
<a href="#">Lissocampus runa</a> Javelin Pipefish [66251]		Species or species habitat may occur within area
<a href="#">Maroubra perserrata</a> Sawtooth Pipefish [66252]		Species or species habitat may occur within area
<a href="#">Mitotichthys meraculus</a> Western Crested Pipefish [66259]		Species or species habitat may occur within area
<a href="#">Nannocampus subosseus</a> Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area
<a href="#">Phycodurus eques</a> Leafy Seadragon [66267]		Species or species habitat may occur within area
<a href="#">Phyllopteryx taeniolatus</a> Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
<a href="#">Pugnaso curtirostris</a> Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
<a href="#">Solegnathus lettiensis</a> Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
<a href="#">Stigmatopora argus</a> Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
<a href="#">Stigmatopora nigra</a> Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
<a href="#">Urocampus carinirostris</a> Hairy Pipefish [66282]		Species or species habitat may occur within area
<a href="#">Vanacampus margaritifer</a> Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
<a href="#">Vanacampus phillipi</a> Port Phillip Pipefish [66284]		Species or species habitat may occur within area
<a href="#">Vanacampus poecilolaemus</a> Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Arctocephalus forsteri</a> Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
<a href="#">Neophoca cinerea</a> Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat known to occur within area
<b>Reptiles</b>		
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known

Name	Threatened	Type of Presence
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Disteira kingii</a> Spectacled Seasnake [1123]		Species or species habitat may occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

## Whales and other Cetaceans [ Resource Information ]

Name	Status	Type of Presence
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### Mammals

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

## Extra Information

### State and Territory Reserves [\[ Resource Information \]](#)

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

### Invasive Species [\[ Resource Information \]](#)

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

Name	Status	Type of Presence
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#### Birds

Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
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Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
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Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
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Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
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Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
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Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
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Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
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Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
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Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
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Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
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#### Mammals

Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
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Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
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Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
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Name	Status	Type of Presence
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
<b>Plants</b>		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large- leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
<p>Olea europaea Olive, Common Olive [9160]</p>		<p>Species or species habitat may occur within area</p>
<p>Opuntia spp. Prickly Pears [82753]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]</p>		<p>Species or species habitat may occur within area</p>
<p>Rubus fruticosus aggregate Blackberry, European Blackberry [68406]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Salix spp. except S.babylonica, S.x calodendron &amp; S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]</p>		<p>Species or species habitat likely to occur within area</p>
<b>Reptiles</b>		
<p>Hemidactylus frenatus Asian House Gecko [1708]</p>		<p>Species or species habitat likely to occur within area</p>

# Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

# Coordinates

-32.12873 115.76212



# 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.

## **Appendix D** – Flora and fauna results

Flora recorded within the survey area

Flora likelihood of occurrence assessment

Fauna recorded within the survey area

Fauna likelihood of occurrence assessment

## Flora species recorded in the survey area during the spring 2019 survey

Family	Genus	Species	Status
Aizoaceae	<i>Carpobrotus</i>	<i>edulis</i>	*
Anacardiaceae	<i>Schinus</i>	<i>terebinthifolia</i>	*
Asparagaceae	<i>Acanthocarpus</i>	<i>preissii</i>	
Asparagaceae	<i>Asparagus</i>	<i>asparagoides</i>	*DP
Asphodelaceae	<i>Trachyandra</i>	<i>divaricata</i>	*
Asteraceae	<i>Hypochaeris</i>	<i>radicata</i>	*
Asteraceae	<i>Osteospermum</i>	<i>ecklonis</i>	*
Asteraceae	<i>Senecio</i>	<i>condylus</i>	
Asteraceae	<i>Senecio</i>	<i>vulgaris</i>	*
Asteraceae	<i>Sonchus</i>	<i>oleraceus</i>	*
Brassicaceae	<i>Brassica</i>	<i>tournefortii</i>	*
Caryophyllaceae	<i>Minuartia</i>	<i>mediterranea</i>	*
Caryophyllaceae	<i>Spergularia</i>	<i>marina</i>	
Chenopodiaceae	<i>Rhagodia</i>	<i>baccata</i>	
Cupressaceae	<i>Callitris</i>	<i>preissii</i>	
Cyperaceae	<i>Lepidosperma</i>	<i>costale</i>	
Cyperaceae	<i>Schoenus</i>	<i>grandiflorus</i>	
Ericaceae	<i>Leucopogon</i>	<i>insularis</i>	
Ericaceae	<i>Leucopogon</i>	<i>parviflorus</i>	
Euphorbiaceae	<i>Euphorbia</i>	<i>peplus</i>	*
Euphorbiaceae	<i>Euphorbia</i>	<i>terraccina</i>	*
Fabaceae	<i>Acacia</i>	<i>cochlearis</i>	
Fabaceae	<i>Acacia</i>	<i>rostellifera</i>	
Fabaceae	<i>Acacia</i>	<i>saligna</i>	
Fabaceae	<i>Hardenbergia</i>	<i>comptoniana</i>	
Fabaceae	<i>Lupinus</i>	<i>angustifolius</i>	*
Geraniaceae	<i>Geranium</i>	<i>molle</i>	*
Geraniaceae	<i>Pelargonium</i>	<i>capitatum</i>	*
Haemodoraceae	<i>Conostylis</i>	<i>candicans</i> subsp. <i>calcicola</i>	
Hemerocallidaceae	<i>Dianella</i>	<i>revoluta</i> var. <i>divaricata</i>	
Lamiaceae	<i>Hemiandra</i>	<i>pungens</i>	
Lauraceae	<i>Cassytha</i>	<i>racemosa</i>	
Myrtaceae	<i>Agonis</i>	<i>flexuosa</i>	Planted
Myrtaceae	<i>Eucalyptus</i>	<i>gomphocephala</i>	
Myrtaceae	<i>Eucalyptus</i>	sp.	*Planted
Myrtaceae	<i>Eucalyptus</i>	sp.	*Planted
Myrtaceae	<i>Leptospermum</i>	<i>laevigatum</i>	*
Myrtaceae	<i>Melaleuca</i>	<i>huegelii</i>	
Myrtaceae	<i>Melaleuca</i>	<i>systema</i>	
Orchidaceae	<i>Caladenia</i>	<i>latifolia</i>	
Papaveraceae	<i>Fumaria</i>	<i>capreolata</i>	*
Papaveraceae	<i>Fumaria</i>	<i>muralis</i>	*
Phyllanthaceae	<i>Phyllanthus</i>	<i>calycinus</i>	
Poaceae	<i>Austrostipa</i>	<i>elegantissima</i>	



Family	Genus	Species	Status
Poaceae	<i>Avena</i>	<i>barbata</i>	*
Poaceae	<i>Avena</i>	<i>fatua</i>	*
Poaceae	<i>Briza</i>	<i>maxima</i>	*
Poaceae	<i>Bromus</i>	<i>diandrus</i>	*
Poaceae	<i>Cenchrus</i>	<i>setaceus</i>	*
Poaceae	<i>Lagurus</i>	<i>ovatus</i>	*
Poaceae	<i>Pennisetum</i>	<i>setaceum</i>	*
Primulaceae	<i>Lysimachia</i>	<i>arvensis</i>	*
Proteaceae	<i>Adenanthos</i>	<i>sericeus</i>	Planted
Proteaceae	<i>Grevillea</i>	<i>preissii</i>	
Proteaceae	<i>Grevillea</i>	<i>preissii</i>	
Proteaceae	<i>Grevillea</i>	sp.	Planted
Ranunculaceae	<i>Clematis</i>	<i>linearifolia</i>	
Rhamnaceae	<i>Spyridium</i>	<i>globulosum</i>	
Rutaceae	<i>Diplolaena</i>	<i>dampieri</i>	
Santalaceae	<i>Exocarpos</i>	<i>sparteus</i>	
Santalaceae	<i>Santalum</i>	<i>acuminatum</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>glabra</i>	

## Quadrat species data

Quadrat	Taxa	Cover	height
Q1	<i>Acacia rostellifera</i>	70-100	4
Q1	<i>Clematis linearifolia</i>	10-30	climber
Q1	* <i>Asparagus asparagoides</i>	<10	climber
Q1	* <i>Fumaria capreolata</i>	<10	0.5
Q1	* <i>Fumaria muralis</i>	<10	0.4
Q1	* <i>Trachyandra divaricata</i>	<2	0.4
Q1	<i>Spergularia marina</i>	<2 numerous	0.03
Q1	* <i>Oxalis pes-caprae</i>	10-30	0.4
Q1	<i>Santalum acuminatum</i>	<10	2.1
Q1	* <i>Sonchus oleraceus</i>	<2 numerous	0.5
Q1	<i>Austrostipa elegantissima</i>	<2	1.1
Q1	* <i>Avena barbata</i>	30-70	0.7
Q1	* <i>Euphorbia peplus</i>	<10	0.3
Q1	<i>Rhagodia baccata</i>	<10	1.2
Q1	* <i>Lagurus ovatus</i>	<2 numerous	0.3
Q1	* <i>Euphorbia terracina</i>	<2 numerous	0.3
Q1	<i>Acacia saligna</i>	<2	2.4
Q2	<i>Acacia rostellifera</i>	70-100	4
Q2	<i>Clematis linearifolia</i>	10-30	climber
Q2	* <i>Asparagus asparagaceae</i>	10-30	climber
Q2	* <i>Avena barbata</i>	30-70	0.4
Q2	<i>Spyridium globulosum</i>	<10	2.8
Q2	* <i>Oxalis pes-caprae</i>	<10	0.3
Q2	<i>Austrostipa elegantissima</i>	<2	1
Q2	* <i>Euphorbia peplus</i>	<10	0.2
Q2	<i>Spergularia marina</i>	<2 numerous	0.03
Q2	* <i>Euphorbia terracina</i>	<2 numerous	1
Q2	* <i>Fumaria capreolata</i>	<2	0.3
Q2	* <i>Minuartia mediterranea</i>	<2 numerous	0.03
Q3	<i>Eucalyptus gomphocephala</i>	10-30	8
Q3	* <i>Leptospermum laevigatum</i>	10-30	3.5
Q3	<i>Melaleuca systema</i>	30-70	1.6
Q3	<i>Spyridium globulosum</i>	10-30	2.3
Q3	<i>Rhagodia baccata</i>	<2	1.1
Q3	<i>Leucopogon parviflorus</i>	<10	1.4
Q3	<i>Acanthocarpus preissii</i>	10-30	1.2
Q3	* <i>Asparagus asparagaceae</i>	10-30	climber
Q3	* <i>Fumaria muralis</i>	<10	0.4
Q3	* <i>Lagurus ovatus</i>	<2 numerous	0.4
Q3	* <i>Sonchus oleraceus</i>	<2 numerous	0.3
Q3	* <i>Pelargonium capitatum</i>	<10	0.5
Q3	* <i>Avena barbata</i>	10-30	0.4
Q3	* <i>Briza maxima</i>	<2	0.4
Q3	<i>Schoenus grandiflorus</i>	<10	0.5

Quadrat	Taxa	Cover	height
Q3	<i>*Euphorbia terracina</i>	<2	0.4
Q3	<i>Hardenbergia comptoniana</i>	<2	climber
Q3	<i>*Poaceae sp.</i>	10-30	0.3
Q3	<i>Austrostipa elegantissima</i>	<10	1.2
Q3	<i>Clematis linearifolia</i>	<10	climber
Q3	<i>*Minuartia mediterranea</i>	<2 numerous	0.03
Q3	<i>Spergularia marina</i>	<2 numerous	0.05
Q3	<i>Cassythia racemosa</i>	<2	climber
Q3	<i>Lepidosperma costale</i>	<2	0.5
Q3	<i>Dianella revoluta</i>	<2	0.8
Q3	<i>*Cenchrus setaceus</i>	<2	0.6
Q3	<i>*Lysimachia arvensis</i>	<2	0.5
Q3	<i>Diplolaena dampieri</i>	<2	1.5
Q3	<i>*Schinus terebinthifolia</i>	<2	1.2
Q3	<i>*Euphorbia peplus</i>	<2 numerous	0.2
Q4	<i>Spyridium globulosum</i>	<10	2.2
Q4	<i>Eucalyptus gomphocephala</i>	<10	8
Q4	<i>*Leptospermum laevigatum</i>	10-30	3
Q4	<i>Melaleuca systema</i>	10-30	2
Q4	<i>*Asparagus asparagaceae</i>	10-30	climber
Q4	<i>Schoenus grandiflorus</i>	<2	0.4
Q4	<i>Austrostipa elegantissima</i>	<10	1.3
Q4	<i>*Lagurus ovatus</i>	<10	0.4
Q4	<i>*Bromus diandrus</i>	10-30	0.4
Q4	<i>*Euphorbia peplus</i>	<2 numerous	0.2
Q4	<i>Cassythia racemosa</i>	<2	climber
Q4	<i>Leucopogon parviflorus</i>	<10	1.2
Q4	<i>*Minuartia mediterranea</i>	<2 numerous	0.05
Q4	<i>Spergularia marina</i>	<2 numerous	0.05
Q4	<i>Hardenbergia comptoniana</i>	<10	climber
Q4	<i>*Avena barbata</i>	30-70	0.6
Q4	<i>*Sonchus oleraceus</i>	<2 numerous	0.2
Q4	<i>Hemiandra pungens</i>	<10	1
Q4	<i>*Euphorbia terracina</i>	<2	0.6
Q4	<i>*Pelargonium capitatum</i>	<2	0.5
Q4	<i>*Oxalis pes-caprae</i>	<2	0.3
Q4	<i>*Cenchrus setaceus</i>	<2	0.4
Q4	<i>Conostylis candicans subsp. calcicola</i>	<2	0.5
Q4	<i>Acanthocarpus preissii</i>	<2	0.5
Q4	<i>*Trachyandra divaricata</i>	<2	0.4
Q4	<i>Lepidosperma costale</i>	<2	0.4
Q5	<i>Acacia rostellifera</i>	30-70	4
Q5	<i>*Schinus terebinthifolia</i>	<10	2.7
Q5	<i>Melaleuca huegelii</i>	<10	2.4
Q5	<i>Spyridium globulosum</i>	10-30	2.2



Quadrat	Taxa	Cover	height
Q5	* <i>Asparagus asparagaceae</i>	30-70	climber
Q5	* <i>Oxalis pes-caprae</i>	30-70	0.2
Q5	* <i>Bromus diandrus</i>	10-30	0.2
Q5	* <i>Euphorbia terracina</i>	<10	0.3
Q5	* <i>Avena barbata</i>	10-30	0.3
Q5	* <i>Sonchus oleraceus</i>	<2 numerous	0.2
Q5	* <i>Leptospermum laevigatum</i>	30-70	4
Q5	<i>Caladenia latifolia</i>	<2	0.4
Q5	* <i>Euphorbia peplus</i>	<2 numerous	0.1
Q5	<i>Eucalyptus gomphocephala</i>	<2	2.1
Q5	* <i>Lagurus ovatus</i>	<2	0.3
Q5	* <i>Fumaria muralis</i>	<2	0.3
Q5	<i>Austrostipa elegantissima</i>	<2	1.2
R1	<i>Acanthocarpus preissii</i>	2-10	0.7
R1	<i>Acacia cochlearis</i>	<2	1.8
R1	<i>Spyridium globulosum</i>	<2	2
R1	* <i>Cenchrus setaceus</i>	30-70	1
R1	* <i>Euphorbia terracina</i>	<2	0.5
R1	* <i>Pelargonium capitatum</i>	<10	0.5
R1	<i>Dianella revoluta</i>	<2	0.8
R1	<i>Schoenus grandiflorus</i>	<10	0.7
R1	* <i>Brassica tournefortii</i>	<2	0.5
R1	* <i>Bromus diandrus</i>	<2	0.4
R1	* <i>Avena barbata</i>	<2	0.4
R1	<i>Austrostipa elegantissima</i>	<2	1
R1	* <i>Oxalis pes-caprae</i>	<2	0.1
R1	* <i>Lagurus ovatus</i>	<2	0.2
R1	* <i>Leptospermum laevigatum</i>	<2	2
R1	<i>Hardenbergia comptoniana</i>	<2	climber
R1	<i>Leucopogon insularis</i>	<2	1
R2	<i>Eucalyptus gomphocephala</i>	<10	7
R2	<i>Acacia saligna</i>	<2	2
R2	<i>Acacia cochlearis</i>	<2	1.2
R2	<i>Acanthocarpus preissii</i>	<10	1
R2	<i>Spyridium globulosum</i>	<10	2
R2	<i>Callitris preissii</i>	<2	4
R2	* <i>Leptospermum laevigatum</i>	1.6	3
R2	* <i>Pelargonium capitatum</i>	<10	0.6
R2	<i>Schoenus grandiflorus</i>	<10	0.9
R2	<i>Conostylis candicans subsp. calcicola</i>	<2	0.6
R2	* <i>Cenchrus setaceus</i>	10-30	0.8
R2	* <i>Bromus diandrus</i>	<10	0.3
R2	* <i>Avena barbata</i>	<10	0.3
R2	* <i>Lagurus ovatus</i>	<2 numerous	0.2
R2	<i>Melaleuca huegelii</i>	<2	1.6

Quadrat	Taxa	Cover	height
R2	<i>Eremophila glabra</i>	<2	1.3
R2	* <i>Lysimachia arvensis</i>	<2 numerous	0.05

## Quadrat/Releve Photographs



**Quadrat 1 – *Acacia* closed shrubland (VT01)**



**Quadrat 2 - *Acacia* closed shrubland (VT01)**





**Quadrat 3 – *Melaleuca* shrubland (VT02)**



**Quadrat 4 – *Melaleuca* shrubland (VT02)**





**Quadrat 5 – *Acacia* closed shrubland (VT01)**



**Releve 1 – \**Cenchrus* grassland (VT03)**





**Releve 2 – Revegetation (VT04)**



**Planted vegetation (VT05)**



### Flora likelihood of occurrence assessment guidelines

Likelihood of occurrence	Guideline
Known	Species recorded within study area from field project results (none as this is a desktop search only).
Likely	Species previously recorded within 2 km and large areas of suitable habitat occur in the project area.
Possible	Species previously recorded within 10 km and areas of suitable habitat occur/may occur in the project area.
Unlikely	Species previously recorded within 20 km, or suitable habitat does not occur in the project area.
Highly unlikely	Species not previously recorded within 20 km, suitable habitat does not occur in the project area and/or the project area is outside the natural distribution of the species.
Other considerations	Date of known records, cryptic nature of species, anecdotal evidence from previous Broome studies/surveys

### Definitions

Term	Description
Study area	A 5 km buffer around the survey area
Survey area	The potential project footprint
Cr	Critically endangered
En	Endangered
T	Threatened
Vu	Vulnerable
P1 – P4	Priority 1 – Priority 4
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
DBCA	Department of Biodiversity and Conservation Attractions 2018. WA Government, Department of Parks and Wildlife Threatened (Declared Rare) and Priority Flora List
BC Act	Biodiversity Conservation Act 2016

### Flora likelihood of occurrence assessment of conservation significant flora identified in the desktop assessment as potentially occurring within the survey area.

Taxa	Common Name	Status		Source			Description and habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM	DBCA		
<i>Acacia lasiocarpa</i> var. <i>bracteolata</i>			P1			X	Shrub, 0.4-1.5 m high. Flowers yellow in May or August. Grey or black sand over clay. Occurs in	Unlikely No suitable habitat considered at the survey area.

Taxa	Common Name	Status		Source			Description and habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM	DBCA		
							swampy areas, winter wet lowlands.	
<i>Austrostipa mundula</i>	-		P3		X	X	Fine clumping grass to 0.5 m. Known to occur on shallow grey sand over limestone on moderate slopes. Limestone ridges.	Unlikely Closest available record located approximately 7 km south of the survey area.
<i>Caladenia huegelii</i>	King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid	EN	T	X		X	Tuberous, perennial, herb, 0.25-0.6 m high. Flowers green & cream & red, Sep to Oct. Grey or brown sand, clay loam.	Unlikely No suitable habitat considered at the survey area
<i>Dampiera triloba</i>			P3			X	Erect perennial, herb or shrub, to 0.5 m high. Flowers blue, August to December.	Unlikely Closest available records are located over 8 km north and north-east of the survey area.
<i>Diuris drummondii</i>	Tall Donkey Orchid	VU	T			X	Tuberous, perennial, herb, 0.5-1.05 m high. Flowers yellow, November to December or January. Low-lying depressions, swamps.	Unlikely No suitable habitat considered at the survey area
<i>Diuris micrantha</i>	Dwarf Bee-orchid	VU	T	X			Tuberous, perennial, herb, 0.3-0.6 m high. Flowers yellow & brown, Sep to Oct. Brown loamy clay. Winter-wet swamps, in shallow water.	Unlikely No suitable habitat considered at the survey area
<i>Diuris purdiei</i>	Purdie's Donkey-orchid	EN	T	X			Tuberous, perennial, herb, 0.15-0.35 m high. Flowers yellow, Sep to Oct. Grey-black sand, moist. Winter-wet swamps.	Unlikely No suitable habitat considered at the survey area
<i>Dodonaea hackettiana</i>	Hackett's Hopbush		P4		X	X	Erect shrub or tree, 1-5 m high. Flowers yellow-green/red, mainly July to October. Sand. Outcropping limestone.	Unlikely This species is known from the local area with the closest known record approximately 500 m south of the survey area.

Taxa	Common Name	Status		Source			Description and habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM	DBCA		
								This species is distinctive and would not likely to have been overlooked within the survey area given the survey intensity.
<i>Drakaea elastica</i>	Glossy-leafed Hammer Orchid, Warty Hammer Orchid	EN	T	X			Tuberous, perennial, herb, 0.12-0.3 m high. Flowers red & green & yellow, Oct to Nov. White or grey sand. Low-lying situations adjoining winter-wet swamps.	Unlikely No suitable habitat considered at the survey area
<i>Drakaea micrantha</i>	Dwarf Hammer-orchid	VU	T	X			Tuberous, perennial, herb, 0.15-0.3 m high. Flowers red and yellow, September to October. White-grey sand.	Unlikely The closest known records are more than 13 km east of the survey area.
<i>Grevillea olivacea</i>			P4		X	X	Erect, non-lignotuberous shrub, 1-4.5 m high. Flowers red/pink, June to September. White-grey sand. Coastal dunes, limestone rocks.	Unlikely There is one record of this species from the Woodman Point area. This species is distinctive and would not likely to have been overlooked within the survey area given the survey intensity.
<i>Hibbertia spicata</i> subsp. <i>leptotheca</i>	-		P3		X	X	Erect or spreading shrub, 0.2-0.5 m high. Flowers yellow, Jul to Oct. Sand. Near-coastal limestone ridges, outcrops & cliffs.	Unlikely No suitable habitat considered at the survey area.
<i>Jacksonia sericea</i>	Waldjumi		P4		X		Low spreading shrub, to 0.6 m high. Flowers orange, usually Dec or Jan to Feb. Calcareous & sandy soils.	Unlikely Suitable habitat may be present however not observed during the survey.
<i>Microtis quadrata</i>	-		P4			X	Erect herb with tuber, 40 cm high. Cream/greenish flowers. Grey sand, shallow clay, sandy clay loam, swamp.	Unlikely No suitable habitat considered at the survey area.



Taxa	Common Name	Status		Source			Description and habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM	DBCA		
<i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i>	-		P3		X	X	Shortly rhizomatous, compactly tufted perennial, grass-like or herb, 0.15-0.4 m high. Flowers cream-white, August to October. White or grey sand, lateritic gravel.	Unlikely No suitable habitat considered at the survey area.
<i>Pimelea calcicola</i>	-		P3		X	X	Erect to spreading shrub, 0.2-1 m high. Flowers pink, Sep to Nov. Sand. Coastal limestone ridges.	Unlikely No suitable habitat considered at the survey area.
<i>Stylidium longitubum</i>			P4			X	Erect annual (ephemeral) herb, 0.05-0.12 m high. Flowers pink October-December. Sandy clay, clay. Seasonal Wetlands.	Unlikely. No suitable habitat considered at the survey area.
<i>Stylidium paludicola</i>			P3			X	Reed-like perennial herb 0.35-1 m high. Flowers pink, October to December. Occurs on peaty sand over clay. Winter wet habitats. Marri and <i>Melaleuca</i> woodland, <i>Melaleuca</i> shrubland.	Unlikely. No suitable habitat considered at the survey area.
<i>Styphelia filifolia</i>			P3			X	Shrub up to 70 cm tall. Flat sandplain, yellow sand and grey sand. Banksia woodland.	Unlikely. No suitable habitat considered at the survey area.
<i>Thelymitra variegata</i>			P2			X	Tuberous, perennial, herb, 0.1-0.35 m high. Flowers orange and red and purple and pink, June to September. Occurs on sandy clay, sand, laterite.	Unlikely. No suitable habitat considered at the survey area.

## Fauna recorded within the survey area during the spring 2019 survey

Family	Taxon	Common name	Status
<b>Birds</b>			
Acanthizidae	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	
Acanthizidae	<i>Gerygone fusca</i>	Western Gerygone	
Acanthizidae	<i>Smicrornis brevirostris</i>	Weebill	
Artamidae	<i>Cracticus tibicen dorsalis</i>	Australian Magpie	
Cacatuidae	<i>Calyptorhynchus latirostris</i>	Carnaby's Cockatoo	En
Cacatuidae	<i>Eolophus roseicapilla</i>	Galah	
Columbidae	<i>Phaps chalcoptera</i>	Common Bronzewing	
Columbidae	<i>Streptopelia senegalensis</i>	Laughing Dove	*
Corvidae	<i>Corvus coronoides perplexus</i>	Australian Raven	
Falconidae	<i>Falco longipennis</i>	Hobby Falcon	
Maluridae	<i>Malurus splendens</i>	Splendid Fairy-wren	
Meliphagidae	<i>Anthochaera carunculata</i>	Red Wattlebird	
Meliphagidae	<i>Lichenostomus virescens</i>	Singing Honeyeater	
Meliphagidae	<i>Lichmera indistincta</i>	Brown Honeyeater	
Meliphagidae	<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	
Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark	
Pachycephalidae	<i>Pachycephala rufiventris</i>	Rufous Whistler	
Psittacidae	<i>Barnadius zonarius</i>	Australian Ringneck	
Rhipiduridae	<i>Rhipidura albiscapa</i>	Grey Fantail	
Rhipiduridae	<i>Rhipidura leucophrys</i>	Willie Wagtail	
<b>Mammals</b>			
Canidae	<i>Canis domesticus</i>	Domestic Dog	*
Leporidae	<i>Oryctolagus cuniculus</i>	Rabbit	*
<b>Reptiles</b>			
Scincidae	<i>Cryptoblepharus buchananii</i>		
Scincidae	<i>Menetia greyii</i>		
Scincidae	<i>Tiliqua rugosa rugosa</i>	Bobtail	

### Fauna likelihood of occurrence assessment guidelines

Assessment outcome	Description
Present	Species recorded during the field survey or from recent, reliable records from within or close proximity to the project area.
Likely	Species are <b>likely</b> to occur in the project area where there is suitable habitat within the survey area and there are recent records of occurrence of the species in close proximity to the project area. OR Species known distribution overlaps with the project area and there is suitable habitat within the project area.
Unlikely	Species assessed as <b>unlikely</b> include those species previously recorded within 5 km of the project area however: <ul style="list-style-type: none"> <li>• There is limited (i.e. the type, quality and quantity of the habitat is generally poor or restricted) habitat in the project area.</li> <li>• The suitable habitat within the project area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area.</li> </ul> OR Those species that have a known distribution overlapping with the project area however: <ul style="list-style-type: none"> <li>• There is limited habitat in the project area (i.e. the type, quality and quantity of the habitat is generally poor or restricted).</li> <li>• The suitable habitat within the project area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area.</li> </ul>
Highly unlikely	Species that are considered <b>highly unlikely</b> to occur in the project area include: <ul style="list-style-type: none"> <li>• Those species that have no suitable habitat within the project area.</li> <li>• Those species that have become locally extinct, or are not known to have ever been present in the region of the project area.</li> </ul>

Source information - desktop searches

NM – DBCA *NatureMap* (accessed September 2019)

PMST – DEE Protected Matters Search Tool (PMST) to identify fauna listed under the EPBC Act potentially occurring within the study area (accessed August 2019)



**Fauna likelihood of occurrence assessment of conservation significant fauna identified in the desktop assessment as potentially occurring within the survey area.**

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
<b>Birds</b>							
<i>Anous tenuirostris subsp. melanops</i>	Australian Lesser Noddy	Vu	En	X	X	The Australian Lesser Noddy is usually found only around its breeding islands in the Houtman Abrolhos Islands in Western Australia. There are also some records north of the breeding islands, for example at the Wallabi Group of islands, in the northern Houtman Abrolhos Islands, on Barrow Island, and at Webb Island. The species usually occupies coral-limestone islands that are densely fringed with White Mangrove <i>Avicennia marina</i> . It occasionally occurs on shingle or sandy beaches (Higgins & Davies 1996). The Australian Lesser Noddy roosts mainly in mangroves, especially at night but may sometimes rest on beaches.	<b>Unlikely</b> The survey area is not considered to provide suitable habitat to support this species.
<i>Ardenna carneipes</i>	Flesh-footed Shearwater, Fleshy-footed Shearwater	Mi	Vu		X	Mainly occurs in the subtropics over continental shelves and slopes and occasionally inshore waters. Individuals also pass through the tropics and over deeper waters when on migration (Marchant & Higgins 1990).	<b>Unlikely</b> The survey area is not considered to provide suitable habitat to support this species.
<i>Arenaria interpres</i>	Ruddy Turnstone	Mi	IA		X	The Ruddy Turnstone is found in most coastal regions with exposed rock coast lines or coral reefs, and also near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches. It can be found on sand, coral or shell beaches, shoals, cays and dry ridges of sand or coral, and in occasionally near river beds, and on inland lakes and adjacent farmland. It strongly prefers rocky shores or beaches with large deposits of rotting seaweed. It has occasionally been sighted in estuaries, harbours, bays and coastal lagoons, among low saltmarsh or on exposed beds of seagrass, around sewage ponds and on mudflats.	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
						In south-west Australia, it may occur on pebble-strewn shores of saltlakes near the coast. On Rottnest Island, it prefers shores with scattered fragments of limestone (DotE 2016). It is also common on all the larger islands south to Penguin Island, but is uncommon from Augusta to Cape Arid (Nevill 2013).	
<i>Ardenna pacifica</i>	Wedge-tailed Shearwater	Mi	Mi		X	The Wedge-tailed Shearwater breeds on the east and west coasts of Australia and on off-shore islands. The species is common in the Indian Ocean, the Coral Sea and the Tasman Sea (Lindsey 1986). Areas where breeding occurs include (Lindsey 1986).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	En	En	X		The Australasian Bittern occurs in or over water in tall reedbeds, sedges, rushes, cumbungi, lignum, rice fields, drains in tussocky paddocks, occasionally in saltmarsh and brackish wetlands. It is present in most southern Australian states including the south of WA.	<b>Highly unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Calidris alba</i>	Sanderling	Mi	IA		X	In Australia, the Sanderling is almost always found on the coast, mostly on open sandy beaches exposed to open sea-swell, and also on exposed sandbars and spits, and shingle banks, where they forage in the wave-wash zone and amongst rotting seaweed. Sanderlings also occur on beaches that may contain wave-washed rocky outcrops. Less often the species occurs on more sheltered sandy shorelines of estuaries, inlets and harbours. Rarely, they are recorded in near-coastal wetlands. There are rare inland records from sandy shores of ephemeral brackish lakes and brackish river-pools (DotE 2016). They are moderately common, and can be found every year on Rottnest beaches and salt lakes (Nevill 2013).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
<i>Calidris canutus</i>	Red Knot	En	En, IA	X	X	In Australasia the Red Knot mainly inhabits intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps, inland lakes or swamps (DotE 2016). They are found near mudflats and estuaries from Murchison to Bunbury but are then uncommon from Wilson Inlet to Esperance. In the Perth region they are mainly found in Alfred Cove and Peel Inlet (Nevill 2013).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Calidris ferruginea</i>	Curlew Sandpiper	Cr, Mi	Cr	X		Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters (Higgins & Davies 1996). Curlew Sandpipers forage on mudflats and nearby shallow water. They forage at the edges of shallow pools and drains of intertidal mudflats and sandy shores. At high tide, they forage among low sparse emergent vegetation, such as saltmarsh, and sometimes forage in flooded paddocks or inundated saltflats. Curlew Sandpipers generally roost on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.



Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
						and other wetlands, occasionally roosting in dunes during very high tides and sometimes in saltmarsh (Higgins & Davies 1996).	
<i>Calidris ruficollis</i>	Red-necked Stint	Mi	IA		X	In Australasia, the Red-necked Stint is mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been recorded on exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals. They also occur in saltworks and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in saltflats. They sometimes use flooded paddocks or damp grasslands. They have occasionally been recorded on dry gibber plains, with little or no perennial vegetation (Higgins & Davies 1996).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Calidris tenuirostris</i>	Great Knot	Cr	Cr	X	X	In Australasia, the species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats. This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, saltlakes and non-tidal lagoons. The Great Knot rarely occurs on inland lakes and swamps. Typically, the Great Knot roosts in large groups in open areas, often at the waters edge or in shallow water close to feeding grounds (DSEWPac 2013).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Calyptorhynchus banksii</i> subsp. <i>naso</i>	Forest Red-tailed Black Cockatoo	Vu	Vu	X	X	Forest Red-tailed Black Cockatoo typically occurs in dense Jarrah ( <i>Eucalyptus marginata</i> ), Karri ( <i>E. diversicolor</i> ) and Marri ( <i>Corymbia calophylla</i> ) forests, however the species also occurs in a range	<b>Likely</b> The survey area provides suitable feeding habitat for this

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
						of other forest and woodland types, including Blackbutt ( <i>E. patens</i> ), Wandoo ( <i>E. wandoo</i> ), Tuart ( <i>E. gomphocephala</i> ), Albany Blackbutt, Yate ( <i>E. cornuta</i> ), and Flooded Gum ( <i>E. rudis</i> ) (DSEWPaC, 2012). Habitats also tend to have an understorey of <i>Banksia</i> spp., <i>Persoonia</i> spp., <i>Allocasuarina</i> spp. The Forest red-tailed Black Cockatoo generally nests in hollows in live or dead trees of marri, karri, wandoo, bullich, blackbutt, tuart and jarrah (DSEWPaC 2012).	species. This species is known to occur in the area.
<i>Calyptorhynchus latirostris</i>	Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo	En	En	X	X	This species mainly occurs in uncleared or remnant native eucalypt woodlands and in shrubland or kwongan heathland dominated by Hakea, Dryandra, Banksia and Grevillea species. The species also occurs in forests containing Marri ( <i>Corymbia calophylla</i> ), Jarrah ( <i>Eucalyptus marginata</i> ) or Karri ( <i>E. diversicolor</i> ). Breeding usually occurs in the Wheatbelt region of Western Australia, with flocks moving to the higher rainfall coastal areas to forage after the breeding season. Feeds on the seeds of a variety of native plants, including Allocasuarina, Banksia, Dryandra, Eucalyptus, Grevillea and Hakea, and some introduced plants (DSEWPaC, 2012).	<b>Present</b> The survey area provides suitable foraging habitat for this species and potential breeding habitat. Carnaby's Cockatoo were observed feeding on <i>Callitris preissii</i> trees during the survey.
<i>Charadrius leschenaultii</i>	Greater Sand Plover, Large Sand Plover	Vu, Mi	Vu	X		In the non-breeding grounds in Australasia, the species is almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs. They are occasionally recorded on near-coastal saltworks and saltlakes, including marginal saltmarsh, and on brackish swamps (DotE 2019).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
<i>Charadrius mongolus</i>	Lesser Sand Plover, Mongolian Plover	En, Mi	En	X	X	In non-breeding grounds in Australia, the Lesser Sand Plover usually occurs in coastal littoral and estuarine environments. It inhabits large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. It also sometimes occurs in short saltmarsh or among mangroves, in saltworks and near-coastal saltpans, brackish swamps and sandy or silt islands in river beds. The species is seldom recorded away from the coast, at margins of lakes, soaks and swamps associated with artesian bores (DotE 2016). The Lesser Sand Plover mainly occurs in northern regions, and becomes more scarce in the south west (Nevill 2013).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Diomedea amsterdamensis</i>	Amsterdam Albatross	En	Cr	X		The Amsterdam Albatross is a marine, pelagic seabird. It nests in open patchy vegetation (among tussocks, ferns or shrubs) near exposed ridges or hillocks. The Amsterdam Albatross is a non-resident visitor to Australia, and may occur in south-west and south Australian waters (DotE 2019).	<b>Highly unlikely</b> No suitable habitat is present within the survey area.
<i>Diomedea dabbenena</i>	Tristan Albatross	En, Mi	Cr	X		Tristan albatross is a marine, pelagic seabird. It forages in open water in the Atlantic Ocean near the Cape of Good Hope, South Africa. It sleeps and rests on ocean waters when not breeding (Marchant & Higgins 1990). The at-sea distribution of this species is poorly defined. There is currently only one definitive record of the Tristan Albatross from Australian waters. A bird banded as a chick on Gough Island was recaptured four years later off Wollongong, NSW (DotE 2019). Satellite-tracking of non-breeding birds from Gough Island have tracked the species to waters off the southern coast of Western Australia and South Australia (ACAP 2009).	<b>Highly unlikely</b> No suitable habitat is present within the survey area.



Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
<i>Diomedea epomophora</i>	Southern Royal Albatross	Vu, Mi	Vu	X		This species breeds on Campbell Island and Auckland Island (NZ region). When not breeding, distribution is possible circumpolar. They can be found in offshore waters of south Australia and over the continental slope off southeast NSW, west and south Tasmania, Victoria and southeast South Australia. They casually visit southern WA and northern NSW (Pizzey & Knight 2012).	<b>Highly unlikely</b> No suitable habitat is present within the survey area.
<i>Diomedea exulans</i>	Wandering Albatross	Vu, Mi	Vu	X		The Wandering Albatross is marine, pelagic and aerial and breeds on Macquarie Island in Australia. On breeding islands, the Wandering Albatross nests on coastal or inland ridges, slopes, plateaux and plains, often on marshy ground (DotE 2019). Nests of the Wandering Albatross are sited on moss terraces, in dense tussocks, and often in loose aggregations on the west (windward) side of islands.	<b>Highly unlikely</b> No suitable habitat is present within the survey area.
<i>Diomedea sanfordi</i>	Northern Royal Albatross	En, Mi	En	X		The Northern Royal Albatross is marine, pelagic and aerial. Its habitat includes subantarctic, subtropical, and occasionally Antarctic waters (Marchant & Higgins 1990). The Northern Royal Albatross nests on flat or gently sloping ground, on slopes, ridges, gullies and plateaux of large islands, and on the summits of islets. Its nests are placed among vegetation that are open enough for adults to easily walk through (DotE 2019).	<b>Highly unlikely</b> No suitable habitat is present within the survey area.
<i>Falco peregrinus</i>	Peregrine Falcon		S		X	The Peregrine Falcon is seen occasionally anywhere in the south-west of Western Australia. It is found everywhere from woodlands to open grasslands and coastal cliffs - though less frequently in desert regions. The species nests primarily on ledges of cliffs, shallow tree hollows, and ledges of building in cities. (Morcombe, 2004).	<b>Likely</b> Suitable foraging habitat is present within the survey area. Suitable nesting sites are limited.
<i>Halobaena caerulea</i>	Blue Petrel	Vu		X		The Blue Petrel is gregarious, occurring in small loose flocks of up to 100, with larger flocks close to	<b>Highly unlikely</b>

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
						breeding islands. It is circumpolar, ranging from pack ice to 30° S. It breeds on offshore stacks near Macquarie Island where 500-600 breeding pairs occur. It is also known to breed on a number of other islands in the southern Atlantic and Indian Oceans. On mainland Australia, the species is mainly seen between July and September.	No suitable habitat is present within the survey area.
<i>Hydroprogne caspia</i>	Caspian Tern	Mi	IA		X	The Caspian Tern is widespread around the Australian coast and is also found in inland areas of the eastern states. The species breeds in pairs or colonies on small islands and sandspits. Habitat consists of coastal or offshore waters, beaches, mudflats, estuaries, larger rivers, reservoirs and some inland lakes (Pizzey & Knight 2012).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Leipoa ocellata</i>	Malleefowl	Vu	Vu	X		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. While Malleefowl are present on Mainland WA, it is not known to occur on Garden Island.	<b>Highly unlikely</b> No suitable habitat is present within the survey area. The closest available record is more than 10 km from the survey area on the mainland.
<i>Limosa lapponica</i>	Bar-tailed Godwit	Vu or Cr, Mi	Vu or Cr, IA	X	X	The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh (Morcombe 2004). They usually forage near the edge of water or in shallow water, mainly in tidal estuaries and harbours and roost on sandy beaches, sandbars, spits and also in near-coastal saltmarshes (Marchant & Higgins 1993).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Macronectes giganteus</i>	Southern Giant Petrel	En, Mi	IA	X	X	The Southern Giant-Petrel is marine bird that occurs in Antarctic to subtropical waters. In summer, it mainly occurs over Antarctic waters, and	<b>Highly unlikely</b>

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
						it is widespread south as far as the pack-ice and onto the Antarctic continent (Marchant & Higgins 1990). The species is not known to breed in Australia.	No suitable habitat is present within the survey area.
<i>Macronectes halli</i>	Northern Giant Petrel	Vu, Mi	IA	X		The Northern Giant Petrel breeds in the sub-Antarctic and visits areas off the Australian mainland during the winter months (May-Oct). They are usually seen in waters off the south of Australia (DotE 2019). The species is primarily Marine.	<b>Highly unlikely</b> No suitable habitat is present within the survey area.
<i>Numenius madagascariensis</i>	Eastern Curlew	Cr, Mi	Cr	X	X	The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass (Marchant & Higgins 1993).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Numenius phaeopus</i>	Whimbrel	Mi	IA		X	The Whimbrel is often found on the intertidal mudflats of sheltered coasts. It is also found in harbours, lagoons, estuaries and river deltas, often those with mangroves, but also open, unvegetated mudflats. It is occasionally found on sandy or rocky beaches, on coral or rocky islets, or on intertidal reefs and platforms. It has been infrequently recorded using saline or brackish lakes near coastal areas. It also uses saltflats with saltmarsh, or saline grasslands with standing water left after high spring-tides, and in similar habitats in sewage farms and saltfields (Higgins & Davies 1996).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Oceanites oceanicus</i>	Wilson's Storm-petrel	Mi	IA		X	Wilson's Storm Petrel spends most of its time at sea but will come onshore to breed. Breeding does not occur within Australia. Birds often congregate and feed at ocean fronts, and are occasionally sighted inshore. Outside of breeding season Wilson's Storm Petrel roosts on the sea surface. Foraging occurs at sea. It is common and widespread from Carnarvon to the north-east Kimberley Division, Western Australia. It is occasionally seen on the south coast	<b>Highly unlikely</b> No suitable habitat is present within the survey area.



Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
						of Western Australia and has occasionally been recorded in south-west Western Australia and further north to Shark Bay (DotE 2019).	
<i>Onychoprion anaethetus</i>	Bridled Tern	Mi	IA		X	In Australia, Bridled Terns are widespread, breeding on offshore islands in western, northern and north-eastern Australia. In Western Australia, breeding is widespread from islands off Cape Leeuwin (extending round the southern coast to Seal Rocks) north to Shark Bay and in Pilbara region and Kimberley Division. At sea, distribution extends from Cape Leeuwin north to Dirk Hartog Island, with isolated mainland coastal records at Point Maud and Ningaloo, and from Barrow Island to the Dampier Archipelago, and at sea off the Kimberley coast from waters west of the Dampier Peninsula to Ashmore Reef and Joseph Bonaparte Gulf (DotE 2019)	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Oxyura australis</i>	Blue-billed Duck		P4		X	The blue-billed duck is a small Australian almost entirely aquatic duck. The blue-billed duck is endemic to Australia's temperate regions, ranging from the south west of Western Australia, extending to southern Queensland, through New South Wales and Victoria, to Tasmania. The species is readily seen on freshwater lakes and billabongs where deep fresh water is present (Morcombe 2004).	<b>Highly unlikely</b> No suitable habitat is present within the survey area.
<i>Pachyptila turtur subantarctica</i>	Fairy Prion (southern)	Vu		X		The fairy prion (southern) breeds on Macquarie Island and a number of other subantarctic islands outside of Australia. In Australia, breeding is recorded on two rock stacks off Macquarie Island and on the nearby Bishop and Clerk Island. The subspecies digs burrows among rocks or low vegetation in which to nest. Burrows may be dug below mat forming herbs. Feeds by plucking food from the ocean surface. Some individuals may	<b>Highly unlikely</b> The survey area is not considered to provide suitable habitat to support this species.

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
						migrate towards New Zealand and southern Australia in winter	
<i>Pandion cristatus</i>	Osprey, Eastern Osprey	Mi	IA		X	Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging. 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. They exhibit a preference for coastal cliffs and elevated islands in some parts of their range but may also occur on low sandy, muddy or rocky shores and over coral cays. They may occur over atypical habitats such as heath, woodland or forest when travelling to and from foraging (DSEWPaC 2016)	<b>Likely</b> The survey area may provide suitable habitat to support this species. T
<i>Pluvialis squatarola</i>	Grey Plover	Mi	IA		X	Australia, the Grey Plover has been recorded in all states, where it is found along the coasts, and it especially abundant on the western and southern coastlines, mainly between The Coorong and western beaches of the Eyre Peninsula in South Australia, and the coast of Western Australia between Albany and the northern Kimberley coast (DotE 2019).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Pterodroma mollis</i>	Soft-plumaged Petrel	Vu		X		The Soft-plumaged Petrel is a marine, oceanic species. Soft-plumaged Petrels are mainly subantarctic, but occur over a wide range of sea surface-temperatures. Soft-plumaged Petrels breed on Maatsuyker Island off southern Tasmania (Wiltshire & Hamilton 2002). Beachcast birds have been found from Maryborough, Queensland, south	<b>Unlikely</b> The survey area is not considered to provide suitable habitat to support this species. .

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
						to NSW, Tasmania, Victoria, South Australia and south-west Western Australia.	
<i>Rostratula australis</i>	Australian Painted Snipe	En	En	X	X	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. Australian Painted Snipe breeding habitat requirements may be quite specific: shallow wetlands with areas of bare wet mud and both upper and canopy cover nearby. The species rarely occurs in south-western Australia, where it was once more common (Marchant & Higgins 1993; Garnett and Crowley 2000).	<b>Unlikely</b> The survey area is not considered to provide suitable habitat to support this species.
<i>Stercorarius antarcticus</i>	Brown Skua		P4		X	This species occurs mostly beyond the continental shelf break but will occasionally venture onto beaches if a seal or whale carcass is present. While breeding does not occur in Australia, the species is a regular winter migrant to Australia waters north to Shark Bay (WA however they are sparse and uncommon (Pizzey & Knight 2012)).	<b>Highly unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Stercorarius parasiticus</i>	Arctic jaeger, Arctic Skua	Mi	IA		X	The Arctic Jaeger primarily lives in offshore waters, bays and harbours and seldom comes to shore. Breeding does not occur within Australia. The Arctic Jaeger can be found in Australian offshore waters between Oct-April and when present, is local and sedentary (Pizzey & Knight 2012).	<b>Highly unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Stercorarius pomarinus</i>	Pomarine Jaeger, Pomarine Skua	Mi	IA		X	The Pomarine Jager lives in offshore waters, bays and harbours and is seldom found onshore. Breeding does not occur within Australia (Pizzey & Knight 2012).	<b>Unlikely</b> The survey area is not considered to provide suitable habitat to support this species.
<i>Sternula nereis nereis</i>	Australian Fairy Tern	Vu	Vu	X		The Fairy Tern occurs along the coast of WA as far north as the Dampier Archipelago near Karratha, but mostly in the southern part of Australia including most of the coastline in the south west. It nests on	<b>Unlikely</b> The survey area does not provide suitable



Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
						sheltered sandy beaches, coastal inlets, spits and banks above the high tide line and below vegetation. It has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands, and mainland coastline (DotE 2016; Nevill 2013). They can also be seen in saltfields, saline or brackish lakes, and sewage ponds near the coast (Pizzey and Knight 2012).	habitat to support this species.
<i>Sterna dougallii</i>	Roseate Tern	Mi	IA		X	In Australia, the subspecies <i>gracillis</i> occurs on much of the west, north and north-east coasts. In Western Australia, the subspecies is regularly recorded north from Mandurah to around Eighty Mile Beach, in the Pilbara Region. In addition, breeding colonies have been established on Lancelin Island and Second Rock, off Western Australia (Higgins & Davies 1996).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Sterna hirundo</i>	Common Tern	Mi	IA		X	The species is a non-breeding migrant to Australia, where it is widespread and common on the eastern coast south to eastern Victoria, and common on parts of the northern coast, mainly east of Darwin. In Western Australia, the species is rarely recorded south of approximately 30° S. Common Terns are marine, pelagic and coastal. In Australia, they are recorded in all marine zones, but are commonly observed in near-coastal waters, both on ocean beaches, platforms and headlands and in sheltered waters, such as bays, harbours and estuaries with muddy, sandy or rocky shores.	<b>Unlikely</b> The survey area is not considered to provide suitable habitat to support this species.
<i>Thalassarche carteri</i>	Indian Yellow-nosed Albatross	Vu, Mi	En	X		The Indian Yellow-nosed Albatross is a marine bird, located in subtropical and warmer subantarctic waters. The Indian Yellow-nosed Albatross forages mostly in the southern Indian Ocean where it is particularly abundant off Western Australia (Marchant & Higgins 1990). In breeding and non-	<b>Highly unlikely</b> The survey area does not provide suitable habitat to support this species.

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
						breeding seasons, the species concentrates over the productive waters of continental shelves, often at coastal upwellings and the boundaries of currents (DotE 2019).	
<i>Thalassarche cauta cauta</i>	Shy Albatross, Tasmanian Shy Albatross	Vu, Mi	Vu	X		The Shy Albatross is the only albatross to breed within Australia. Breeding occurs on Albatross Island (Bass Strait), Pedra Branca and the Mewstone (Tasmania). Adults remain within a few hundred kilometres of breeding sites feeding mostly over continental slope and shelves. Common in all months (but mostly winter) in Vic, Tas, NSW and SA but uncommon in WA north of Carnarvon (Pizzey & Knight 2012).	<b>Highly unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Thalassarche cauta steadi</i>	White-capped Albatross	Vu, Mi	Vu	X		The White-capped Albatross is a marine species and occurs in subantarctic and subtropical waters. It reaches tropical areas associated with the cool Humboldt Current off South America (Marchant & Higgins 1990). The White-capped Albatross has been noted in shelf-waters around breeding islands and over adjacent rises. During the non-breeding season, birds have been observed over continental shelves around continents. The species occurs both inshore and offshore and enters harbours and bays (DotE 2019).	<b>Highly unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Thalassarche impavida</i>	Campbell Albatross, Campbell Black-browed Albatross	Vu, Mi	Vu	X		The Campbell Albatross is a marine sea bird inhabiting sub-Antarctic and subtropical waters from pelagic to shelf-break water habitats (Marchant & Higgins 1990). In breeding and non-breeding seasons, the Campbell Albatross are specialised shelf feeders, concentrating around breeding islands or over adjacent submarine banks (Weimerskirch et al. 1986, 1988). In winter, they are commonly found in the coastal waters of continents, over up-wellings or boundaries of currents (DotE 2019). The Campbell Albatross breed on Campbell	<b>Highly unlikely</b> The survey area does not provide suitable habitat to support this species.

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
						Island (Marchant & Higgins 1990). They make their nests on tussock-covered ledges and terraces of cliffs, slopes and hills, overlooking the sea or valleys, and on the summits of rocky islets (DotE 2019).	
<i>Thalassarche melanophris</i>	Black-browed Albatross	Vu, Mi	En	X		The Black-browed Albatross is a marine species that inhabits Antarctic, subantarctic and temperate waters and occasionally enters the tropics (Brooke 2004; Marchant & Higgins 1990). The Black-browed Albatross breeds within Australian jurisdiction on Heard Island, McDonald Islands, Macquarie Island and Bishop and Clerk Islets (DotE 2019).	<b>Highly unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Thalasseus bergii</i>	Crested Tern	Mi	IA		X	This species occurs in coastal and offshore waters, beaches, bays, inlets, tidal rivers, salt swamps, lakes and large rivers. It is found around the coast of Australia including Tasmania. Breeding colonies are known to seek islands (Pizzey & Knight 2012).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Tringa nebularia</i>	Common Greenshank, greenshank	Mi	IA		X	The Common Greenshank does not breed in Australia; however, the species occurs in all types of wetland and has the widest distribution of any shorebird in Australia (DSEWPaC 2013).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Sternula albifrons</i>	Little Tern	Mi	Mi		X	The Australian breeding population can be divided into two major subpopulations: (1) a northern subpopulation that breeds across northern Australia, from about Broome in north-western Western Australia (where first recorded only in December 1995), through coastal Northern Territory (mainly from just west of Darwin to the Queensland border) to the Gulf of Carpentaria and eastern Cape York Peninsula (with an extended breeding season covering most of the year); and (2) an eastern subpopulation that breeds on the eastern and south-eastern coast of the mainland and northern and eastern Tasmania, occasionally extending as	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.



Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
						far west as western Victoria and south-eastern South Australia (and breeding in the austral spring-summer).(DoEE 2019)	
<i>Thinornis rubricollis</i>	Hooded Plover	Mi	Mi		X	The Hooded Plover occurs on sandy beaches between Jervis Bay, New South Wales and the Eyre Peninsula, South Australia, as well as in Tasmania and between Esperance and Perth in south-west Western Australia.They are not abundant (Birdlife Australia 2019)	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Tringa brevipes</i>	Grey-tailed Tattler		P4		X	There are a few scattered records for the species along the south coast near the Eyre Bird Observatory, Point Malcolm, Rossiter Bay, Shark Lake Nature Reserve and surrounding swampland. It is found in the south-west between Augusta and Cervantes. The Grey-tailed Tattler is widespread from Houtman Abrolhos and the mainland adjacent to the Kimberley Division. It has also been recorded inland at Lake Argyle and on islands off the coast (Higgins & Davies 1996).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Actitis hypoleucos</i>	Common Sandpiper	Mi	Mi		X	Habitat for this species is 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. This species is widespread and scattered, common on the north and west coasts and uncommon in the south-east and interior (Morcombe 2004).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Tringa stagnatilis</i>	Marsh Sandpiper, little greenshank	Mi	Mi		X	The Marsh Sandpiper is found on coastal and inland wetlands throughout Australia. In Western Australia they are mainly found around the coast. A few visit New Zealand. The Marsh Sandpiper is also recorded on Lord Howe Island, Norfolk Island, Chatham Island and Christmas Island (Higgins & Davies 1996).	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
<i>Pluvialis fulva</i>	Pacific Golden Plover	Mi	Mi		X	Mainly coastal habitats; usually in small parties or quite large flocks on estuaries, intertidal mudflats, beaches, reefs, salt marshes, offshore islands; only rare far inland.	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Tyto novaehollandiae</i> subsp. <i>novaehollandiae</i>	Masked Owl (southwest)		P3		X	Roosts and nests in heavy forest; hunts over open woodland and farmland. Uncommon to rare. Nest is usually a cavernous hollow in the trunk or a main limb of a large tree in heavy forest, but often near open country over which the owls hunt.	<b>Likely</b> This species has previously been recorded in the Woodman Point area. The survey area may be used opportunistically for foraging however there is no suitable nesting sites in the survey area.
<i>Xenus cinereus</i>	Terek Sandpiper		P3		X	In Western Australia (WA), the Terek Sandpiper is rarely seen on the south coast: occasionally around Eyre and several records around Albany. On Swan River plain, it has been recorded between Bunbury and the mouth of the Moore River. The species is widespread in the Pilbara region and Kimberley Division, from Dampier to Wyndham, with occasional records around Shark Bay. In the Northern Territory (NT), widespread records occur from Darwin, north to Melville Island, and east to the western section of the Gulf of Carpentaria, around Gove Peninsula, Groote Eylandt, Sir Edward Pellew Island and the mouth of the McArthur River (DoEE 2019). Inhabits coastal mudflats in sheltered estuaries and lagoons as well as sandbars, reefs, coastal swamps, saltfields.	<b>Unlikely</b> The survey area does not provide suitable habitat to support this species.

## Mammals

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
<i>Dasyurus geoffroii</i>	Chuditch, Western Quoll	Vu	Vu	X		The Chuditch inhabits eucalypt forest (especially Jarrah, <i>E. marginata</i> ), dry woodland, mallee shrublands, heaths, and desert, particularly in the south coast of WA. They also occur at lower densities in drier woodland and mallee shrubland in the goldfields and wheatbelt, as well as in Kalbarri National Park (translocated). Chuditch require adequate numbers of suitable den and refuge sites (horizontal hollow logs or earth burrows) to survive (DEC 2012). In Jarrah forest, Chuditch populations occur in both moist, densely vegetated, steeply sloping forest and drier, open, gently sloping forest (Van Dyke and Strahan 2008). The species can travel large distances, and for this reason requires habitats that are of a suitable size and not excessively fragmented.	<b>Highly unlikely</b> The survey area does not provide suitable habitat to support this species. The closest available record is more than 10 km from the survey area.
<i>Hydromys chrysogaster</i>	Water-rat, Rakali		P4		X	Water-rats live primarily in a wide variety of freshwater habitats, from sub-alpine streams and other inland waterways to lakes, swamps, farm dams and irrigation channels and are thought to be one of the few native species to have at least partially benefited from human encroachment (Gardner and Serena, 1995).	<b>Highly unlikely</b> The survey area does not provide suitable habitat to support this species.
<i>Isoodon fusciventer</i>	Quenda		P4		X	The Quenda prefers dense scrubby, often swampy, vegetation with dense cover up to one metre high. However, it also occurs in woodlands, and may use less ideal habitat where this habitat occurs adjacent to the thicker, more desirable vegetation. The species often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover (Van Dyck and Strahan, 2008).	<b>Likely</b> Suitable habitat is present in the survey area. There are a number of records in the area however no evidence of their presence was recorded during the survey.
<i>Pseudocheirus occidentalis</i>	Western Ringtail	Cr	Vu	X		Ideal habitat for the Western Ringtail Possum comprises long unburnt mature remnants of	<b>Highly unlikely</b>



Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
	Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit					peppermint ( <i>Agonis flexuosa</i> ) woodlands with high canopy continuity; others comprise of jarrah ( <i>Eucalyptus marginata</i> )/marri ( <i>Corymbia calophylla</i> ) forests and woodlands with adequate hollows, coastal heath, myrtaceous heaths and shrublands, Bullich ( <i>E. megacarpa</i> ) dominated riparian zones and karri forests. Populations are associated with swamps, water courses or floodplains, and at topographic low points which provide cooler, often more fertile conditions. Their current distribution is patchy and largely restricted to the moister south-western corner of WA, especially in the Australind/Eaton area to Waychinicup National Park. The Upper Warren area east of Manjimup is the only place the possum survives in the absence of coastal peppermint (DotE 2019).	The survey area does not provide suitable habitat to support this species. The closest available record is more than 10 km from the survey area.
<b>Reptiles</b>							
<i>Lerista lineata</i>	Perth Slider, Lined Skink		P3		X	Locally restricted to the Swan Coastal Plain south of the Swan River including Rottneest and Garden Islands, where it inhabits coastal dunes, banksia/eucalypt woodlands and suburban gardens. There are also isolated populations on the mid-west coast at Woodleigh Station and in Busselton (Wilson and Swan 2013).	<b>Likely</b> The survey area provides suitable habitat to support this species.
<i>Neelaps calonotos</i>	Black-striped Snake		P3		X	This Black-striped Snake is restricted to the sandy coastal strip near Perth, between Mandurah and Lancelin. It occurs on dunes and sand-plains vegetated with heaths and eucalypt/banksia woodlands. This species is seriously threatened by increasing development within its restricted distribution (Wilson and Swan, 2013).	<b>Likely</b> The survey area provides suitable habitat for this species.
<b>Invertebrates</b>							
<i>Idiosoma sigillatum</i>	Swan Coastal Plain shield-		P3		X	<i>Idiosoma sigillatum</i> is the dominant idiopid trapdoor spider on the Swan Coastal Plain, where it occurs from Dalyellup north to at least Ledge Point	Unlikely The survey area is not considered to contain

Taxon	Common name	Status		Source		Habitat requirements	Likelihood of occurrence within the survey area
		EPBC Act	BC Act/ DBCA	PMST	NM		
	backed trapdoor spider					(including Rottnest Island and Garden Island) with the eastern limit of its range along the sandy foothills of the Darling Escarpment, from Boyanup north to at least Gingin (Rix et al. 2018, WAM 2018). Many of these records are historical in nature and occur within the Perth metropolitan area. It is highly likely that much of the habitat for this species within the Perth metropolitan area has been cleared for urban development and the species is unlikely to occur through much of its historical distribution in urban areas except in remnant habitats (e.g. Kings Park, Bold Park, and Shenton Park bushland) (Rix et al 2018). Burrows of <i>Idiosoma sigillatum</i> usually occur in <i>Banksia</i> woodland and heathland on sandy soils (Rix et al. 2018).	significant habitat for this species.
<i>Westralunio carteri</i>	Carter's Freshwater Mussel	VU	VU		X	Carter's Freshwater Mussel is usually found in freshwater river pools. They are most common in areas with muddy, silty and sandy bottoms and flowing permanent water. Environmental tolerances of <i>W. carteri</i> are not precisely known, but they can be found where water temperatures range from 4 °C to over 30 °C.	Highly Unlikely There are no water bodies within the survey area.

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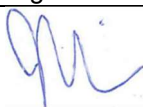
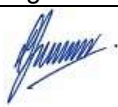
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44563/[https://projectsportal.ghd.com/sites/pp13\\_02/woodmanpointcaravanp/ProjectDocs/12511610-REP-A\\_Woodman Point Caravan Park Extension Flora and fauna assessment.docx](https://projectsportal.ghd.com/sites/pp13_02/woodmanpointcaravanp/ProjectDocs/12511610-REP-A_Woodman Point Caravan Park Extension Flora and fauna assessment.docx)

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	E Lynch	J Collins		D Farrar		25/05/2020





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# Memorandum

18 May 2020

To Discovery Holiday Parks

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Copy to

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From Erin Lynch

Tel +61 8 62228316

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Subject Additional vegetation survey

Job no. 12511610

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## 1 Introduction

GHD has been engaged by Discovery Parks to undertake a range of environmental studies for the proposed expansion of Woodman Point Caravan Park located off Cockburn Road, Munster. In September 2019 GHD undertook a detailed flora and vegetation survey and Level 1 fauna survey of the proposed Woodman Point Caravan Park expansion (an original project area of 3.19 ha) (GHD 2020). Discovery Parks has recently identified they will need to increase the footprint of the park extension to the north and east, with an additional footprint of 0.29 ha.

Discovery Parks has commissioned GHD to undertake a targeted vegetation assessment for significant ecological communities and targeted black cockatoo tree survey within the additional footprint of the revised caravan park boundary.

The limitations and assumptions outlined in the GHD biological assessment report (GHD 2020) also apply to this memorandum.

## 2 Methodology

### 2.1 Vegetation assessment

GHD ecologist Erin Lynch (flora licence no. SL012374) completed a vegetation assessment of the additional footprint (additional survey area) on the 18 March 2020. The field survey was undertaken to verify the dominant vegetation units and vegetation condition of the additional survey area are consistent with the results of the previous flora and vegetation assessment of the adjoining project area (GHD 2020). The identification and mapping of conservation significant ecological communities and searches for conservation significant flora taxa was also undertaken within the additional survey area.

The survey methods involved traversing the additional survey area on foot and making opportunistic recordings, photographic reference points within identified vegetation units and targeted searches for the presence of indicator species for two Threatened Ecological Communities (TECs) identified as potentially occurring within the project area.

Navigation across the site and the recording of data in the field was achieved by using hand-held GPS tools, including a Samsung tablet and Garmin GPS. This ensured accurate representation of features observed on the ground into spatial mapping.

The survey methodology employed by GHD was undertaken with reference to the Environmental Protection Authority (EPA) *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016).

### **Vegetation condition**

The vegetation condition was assessed and mapped in accordance with the South West and Interzone Botanical Provinces of Western Australia (IBRA) scale devised by Keighery (1994) and adapted by EPA (2016). The scale recognises the intactness of vegetation and consists of six rating levels.

## **2.2 Black cockatoo assessment**

A targeted Black Cockatoo tree survey was undertaken in conjunction with the vegetation survey to identify any potential breeding trees (suitable breeding tree with a Diameter at Breast Height (DBH) greater than 500 mm) within the additional footprint.

The tree survey was conducted in accordance with the EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's Cockatoo (Endangered) *Calyptorhynchus latirostris*, Baudin's Cockatoo (Vulnerable) *Calyptorhynchus baudinii*, and Forest Red-tailed Black Cockatoo (Vulnerable) *Calyptorhynchus banksii naso* (Department of Sustainability, Environment, Water, Populations, and Communities (DSEWPaC 2012).

## **2.3 Survey limitations**

The limitations and constraints associated with this field survey are consistent with those outlined in Table 2 of the GHD Biological assessment report (GHD 2020). The present survey effort has not been subject to any further constraints which affect the thoroughness of the assessment and the conclusions which have been formed.

# **3 Results**

## **3.1 Vegetation types and condition**

The vegetation identified within the additional footprint is consistent with the vegetation types and condition previously identified by GHD (2020). The vegetation within the additional survey area ranges from good to degraded condition. The project area has been subject to a long history of disturbances including clearing, activity associated with the Munitions Magazines, weed invasion, introduced fauna (rabbits and foxes), and edge effects from adjacent land uses (caravan park and roads). All five vegetation types identified by GHD (2020) extended into the additional survey area and include:

- *Acacia* closed shrubland (VT01)
- *Melaleuca* shrubland (VT02)
- \**Cenchrus* grassland (VT03)
- Revegetation (VT04)
- Planted (VT05)

However, based on observations and a reassessment of the vegetation in the area due to the additional footprint, the Revegetation vegetation type (VT04) is also considered representative of Tuart open woodland. This is based on the presence of a number of larger mature tuarts within the extended footprint and the presence of more mature tuarts to the north (north of Nyyerbup Circuit) and west of the project area. Within the original survey area there was only one mature sized tuart with a number emerging tuarts scattered throughout the revegetated area. The majority of which had evidence of being planted (green plastic plant bags remain around the base of trees).

The tuart open woodland consists of *Eucalyptus gomphocephala* (tuart) open woodland with occasional scattered *Callitris preissii* over *Acacia cochlearis*, *Spyridium globulosum* and *Melaleuca huegelii* open shrubland to scattered tall shrubs over *Acanthocarpus preissii*, *Eremophila glabra* and *Rhagodia baccata* low open shrubs over an predominantly cleared ground cover dominated by weedy grasses and herbs (dominant species *\*Lagurus ovatus*, *\*Avena barbata*, *\*Asparagus asparagoides*, and *\*Cenchrus setaceus*).

Historical aerial imagery shows a large proportion of the area which has been mapped as tuart open woodland/Revegetation (VT04) has previously been cleared within the last 40 years, with revegetation evident over the last 15 to 20 years. The revegetation of trees and shrubs within the area appears to be successful.

### 3.2 Conservation significant ecological communities

#### *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands TEC

As identified in the desktop assessment by GHD (2020), the proposed expansion is located within the known occurrence/buffer area of one State-listed TEC. The TEC is identified as *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands (Swan Coastal Plain community type 30a) listed under the *Biodiversity and Conservation Act 2016* (BC Act). The community was endorsed as a TEC with a threat ranking of Vulnerable by the WA Minister for Environment in November 2011.

The flora and vegetation survey undertaken in September 2019 (GHD 2020) identified the presence of small patches/isolated trees of *Callitris preissii* within the original survey area. The vegetation in this area was identified as Revegetation (VT04). VT04 was described as previously cleared areas where natural regrowth of some native plant species has occurred. Natural regrowth is scattered with an understorey dominated by introduced grasses and herbs. Evidence of revegetation of native trees and shrubs (presence of plastic plant bags around tree trunks and bamboo sticks) was present around a number of tree species including *Eucalyptus gomphocephala* (tuart) and *Callitris preissii* (Rottnest Pine).

Previous vegetation mapping of the Woodman Point area (Regeneration Technology 2002, as cited in Department of Environment and Conservation 2010) shows the vegetation within the additional survey area as *Acacia rostellifera* open heath, closed heath and low closed forest, as well as cleared areas. Patches of *Eucalyptus gomphocephala* open forest also occurs in the general area. The *Callitris preissii* (or *Melaleuca lanceolata*) low closed and low open forest (TEC) appears to be generally restricted closer to the coastline.

GHD (2020) concluded the vegetation within the original project area did not meet the key diagnostic criteria for this TEC due to the degraded nature of the vegetation and evidence of plantings. However after the follow-up survey, additional patches of *Callitris preissii* trees were identified within the extended footprint, which were growing in association with *Eucalyptus gomphocephala*, *Spyridium globulosum*, *Acanthocarpus preissii*, *Rhagodia baccata* and *\*Asparagus asparagoides*, which are all considered typical and common native and introduced taxa associated with this TEC community (Plates 1 and 2).





**Plate 1 and 2** Site photographs of *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands TEC within the additional survey area

*Callitris preissii* is indicative of the floristic community type (FCT) 30a – *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands and its presence at a site distinguishes the 30a community type from other communities. The species is not present in other FCTs. In the case of the additional survey area and following advice from Department of Biodiversity Conservation and Attractions, the presence of the TEC is confirmed where *Callitris preissii* is present (within its known range of occurrence), even if the trees have been planted and the vegetation is in degraded condition.

It is considered that degraded remnants of the *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands TEC is present within the extended footprint as well as within the original footprint of the proposed park extension. The area has suffered a long history of disturbances including clearing and revegetation, therefore the vegetation types present have undergone considerable changes.

There is a total of 0.47 ha of vegetation which is considered representative of the TEC within the original footprint and additional survey area. The extent of the TEC is mapped in Figure 1 (attached). Spatial mapping of the extent of the TEC focused on the presence of *Callitris preissii*.

### ***Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain TEC and Tuart (Eucalyptus gomphocephala) woodlands of the Swan Coastal Plain PEC***

Tuart (*Eucalyptus gomphocephala*) woodland and forests of the SCP TEC was listed in July 2019 as a Critically Endangered TEC under the EPBC Act. DotEE (2019) defines the key diagnostic characteristics of this community to include, but not limited to:

- Occurs in the Swan Coastal Plain (SCP) Bioregion
- Primarily occurs on the Spearwood and Quindalup dune systems
- The primary defining feature is the presence of at least two living established (>15 cm DBH) tuart trees in the uppermost canopy layer, although they may co-occur with trees of other species
- There is a gap of no more than 60 m between the outer edges of the canopies of adjacent Tuart trees
- Biotic and patch size thresholds.

GHD (2020) did not consider the vegetation within the original project area to meet the key diagnostic criteria for this TEC as only two isolated mature tuart trees were present, which were greater than 60 m apart. It was noted there is likely to be a patch north of the original project area however, this patch did not intersect with the original survey area.

Based on a reassessment of the project area with the additional footprint, and measuring the size of the young planted tuart trees scattered within the revegetated area, it is considered the vegetation

(VT04) is representative of the Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain TEC and the Tuart (*Eucalyptus gomphocephala*) woodlands of the SCP PEC.

The key characteristics of VT04 that are synonymous with the Tuart TEC and PEC include:

- The community occurs on the SCP within the Quindalup dune system
- The vegetation of VT04 forms part of a larger remnant of similar vegetation in similar or better condition (north and west of the extended project area), which is likely to have a patch size greater than 5 hectares (ha). All Tuart patches that are >5 ha are considered part of the Tuart TEC regardless of the understorey condition
- The community is described as a Tuart woodland with 10-30% Tuart canopy cover. The distance between the outer edges of significant tuart trees is less than 60 m.

The difference between the Tuart TEC and Tuart PEC is that the PEC has no minimum condition or patch size thresholds. Therefore the Tuart PEC is also considered to be present.

There is one patch of this TEC (which forms part of a larger patch outside the project area) occurring within the total project area, which is 1.885 ha (total patch size excludes the building structures located within the 30 m buffer of the tree canopies).

Mapping of the extent of the Tuart TEC and PEC within the project area is shown on Figure 1 (attached) and representative photographs of the tuart woodlands within the project area are shown in Plates 3 and 4.



**Plates 3 and 4** Site photographs of the Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain TEC and Tuart (*Eucalyptus gomphocephala*) woodlands of the Swan Coastal Plain PEC

### 3.3 Conservation significant flora

No flora of conservation significance was recorded within the additional footprint and none are considered likely to occur.

### 3.4 Black cockatoo habitat trees

Two additional black cockatoo potential breeding trees (*Eucalyptus gomphocephala* - tuart) with a DBH greater than 500 mm were identified and recorded within the additional footprint. These trees did not contain hollows. The majority of the tuarts throughout the project area are young trees with a medium DBH of approximately 15-20 cm.

## 4 References

Department of the Environment and Energy (DotEE) 2019, *Approved Conservation Advice (incorporating listing advice) for the Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain ecological community*. Canberra: Department of the Environment and Energy. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/153-conservation-advice.pdf>

Department of Environment and Conservation (DEC) 2010, Woodman Point Regional Park Management Plan 2010, prepared by the Department of Environment and Conservation on behalf of the Conservation Commission of Western Australia.

Department of Parks and Wildlife 2014, *Callitris preissii (or melaleuca lanceolata) forests and woodlands (Swan Coastal Plain community type 30a – Gibson et al. 1994). Interim Recovery Plan No. 340*. Department of parks and Wildlife, Perth.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) 2012, *EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species: Carnaby's Black Cockatoo, Baudin's Black Cockatoo and Forest red-tailed Black Cockatoo*, Canberra, Department of Sustainability, Environment, Water, Population and Communities.

Environmental Protection Authority (EPA) 2016, *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*, Perth, Environmental Protection Authority.

GHD 2020, *Woodman Point Caravan Park Expansion - Environmental Studies Flora and Fauna Survey*, unpublished report for Discovery Holiday Parks, Perth, Western Australia.

Keighery, BJ 1994, *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*, Nedlands, Australia, Wildflower Society of Western Australia (Inc.).

Regeneration Technology 2002, Woodman Point Regional Park Weed Control and Revegetation Plan, Department of Conservation and Land Management, Perth, Western Australia.

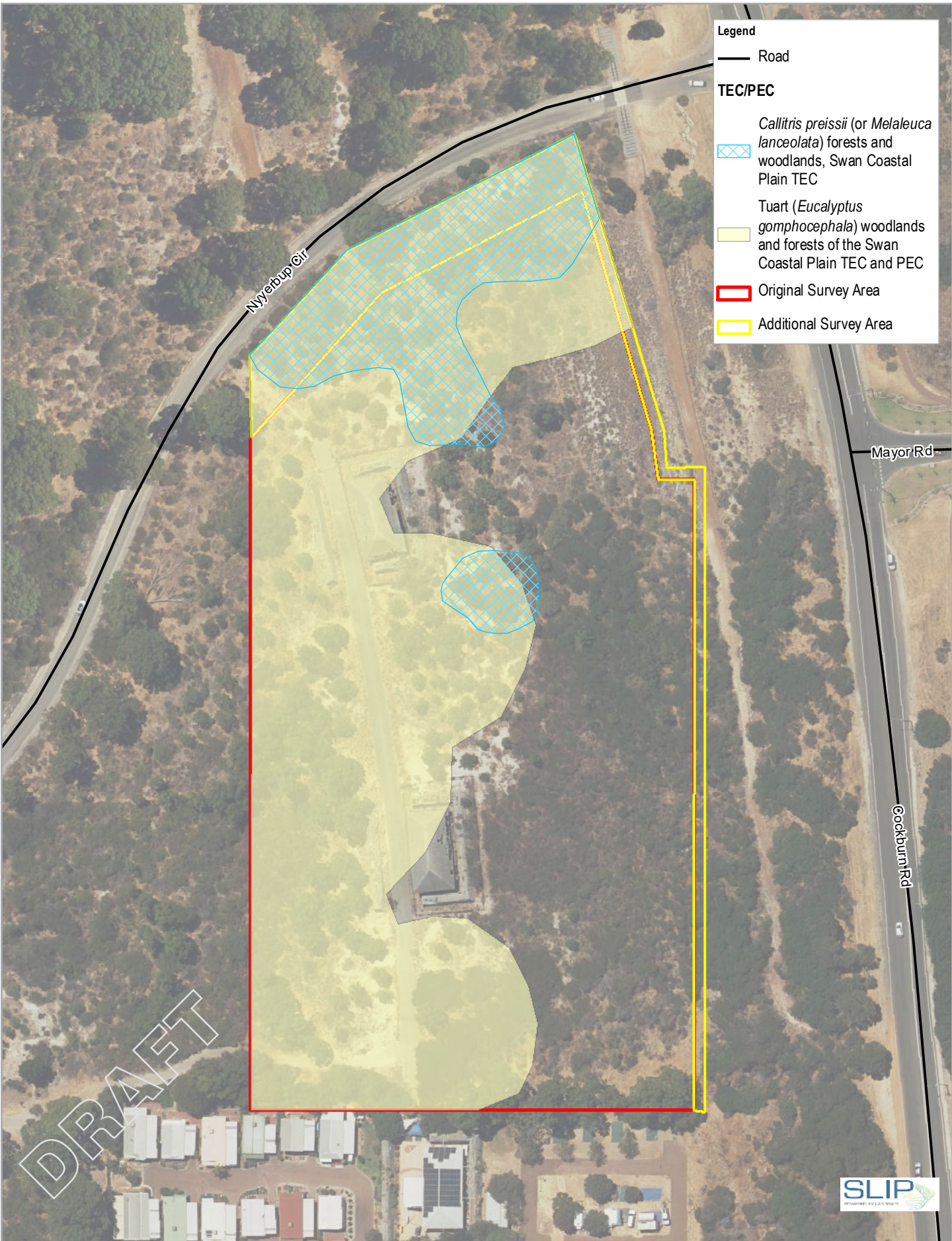
Regards



**Erin Lynch**

Ecologist





**Legend**

— Road

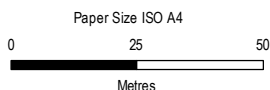
**TEC/PEC**

*Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands, Swan Coastal Plain TEC

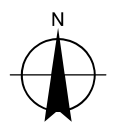
Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain TEC and PEC

Original Survey Area

Additional Survey Area



Map Projection: Transverse Mercator  
 Horizontal Datum: GDA 1994  
 Grid: GDA 1994 MGA Zone 50



Discovery Holiday Parks  
 Woodman Point Caravan Park Expansion

**Threatened and Priority Ecological Communities**

Project No. 61-12511610  
 Revision No. A  
 Date 18/05/2020



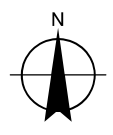
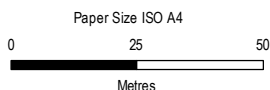
**FIGURE 1**





**Legend**

- ★ Potential Black Cockatoo Habitat Tree
- Road
- Original Survey Area
- Additional Survey Area



**Discovery Holiday Parks  
Woodman Point Caravan Park Expansion**

Project No. **61-12511610**  
Revision No. **A**  
Date **18/05/2020**

Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 50

**Black Cockatoo Potential Habitat Trees**

**FIGURE 2**