



Fauna Assessment at Coral Bay for RAC Parks & Resorts

April 2019

Draft Report



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Executive Summary

RAC Parks and Resorts (RAC) is proposing to clear vegetation at three separate sites in Coral Bay as a result of a proposed expansion to infrastructure (total area approximately 13.32 ha). Western Ecological was commissioned by Coterra Environment to undertake a Level 1 terrestrial vertebrate fauna assessment at the three Coral Bay sites in order to support a native clearing permit associated with the removal of vegetation.

Database searches of the Western Australian Department of Biodiversity, Conservation and Attractions NatureMap and the Commonwealth Department of the Environment and Energy Protected Matters Search Tool (PMST) were undertaken to identify fauna species of conservation significance potentially occurring in and near Coral Bay.

The field assessment was undertaken over two days (including return travel to Coral Bay from Perth via plane and car) from the 2 – 3 April 2019 by one qualified Zoologist. In the field habitat assessments were undertaken in the proposed development footprint throughout the Survey Area i.e. in all three sites. These fauna habitats were assessed for their potential to support species of conservation significance and the quality of habitat they provide to a wider suite of fauna. The habitat assessments were documented systematically for each habitat type on standardised field sheets. Fauna observations were recorded opportunistically during the field assessment. Other recordings included visual sightings of active fauna such as reptiles and birds, signs of species presence such as burrows and scats of mammals.

The database searches returned a total of 186 vertebrate species from 68 families. These were comprised of 37 reptile species from nine families, 122 bird species from 46 families, and 27 mammal species from 13 families. No amphibian species were present in the database searches.

A total of 79 conservation significant vertebrate species (including Priority species) from 23 families were identified during the desktop review of the database searches. These were comprised of 13 reptile species from three families, 51 bird species from 15 families, and 15 mammal species from five families. A total of seven conservation significant species are considered further with two species considered Likely to occur in the survey area, and five species are considered Unlikely to occur.

No amphibians were recorded during the assessment, but two reptile species were recorded, a *Ctenophorus* sp. which could not be identified to species and the Sand Goanna (*Varanus gouldii*). During the field assessment 17 bird species from 14 families were recorded. The most commonly recorded species across the three sites was the Zebra Finch (*Taeniopygia guttata*). Only six of the 17 bird species were recorded in the three sites, the remaining 11 species were seen incidentally around Coral Bay while moving between the sites. Only one mammal species was recorded – the Red Kangaroo (*Macropus rufus*). The Red Kangaroo was recorded at all three sites during the assessment, either directly or indirectly (scats).

During the field survey six fauna habitat assessments were undertaken across the three separate sites at Coral Bay and only one fauna habitat type was described in each of the three sites – dune habitat. Each of the three sites also had areas that were either cleared of native vegetation, had non-native vegetation, buildings, roads and tracks and a non-manned fuel station and these were placed into the category of cleared.



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1. Introduction

1.1 Background

RAC Parks and Resorts (RAC) is proposing to clear vegetation at three separate sites in Coral Bay as a result of a proposed expansion to infrastructure and redevelopment (including expansion) of existing buildings and facilities (Figure 1). Western Ecological was commissioned by Coterra Environment to undertake a terrestrial vertebrate fauna assessment at the three Coral Bay sites in order to support a native clearing permit associated with the removal of vegetation.

Given the relatively small size of the three separate sites (when combined about 13.32 ha), their location which is adjacent to Coral Bay and as a consequence the amount of existing disturbance at each site, a level 1 fauna survey was deemed appropriate.

1.2 Objectives and Scope

The broad objectives of the level 1 terrestrial vertebrate fauna assessment were to:

- Conduct a review of relevant databases and relevant literature where available.
- Undertake a habitat assessment in the field to define and delineate the main broad habitats present in the three assessment sites and make opportunistic observations of fauna (reconnaissance survey).
- Document all of the above in a report.

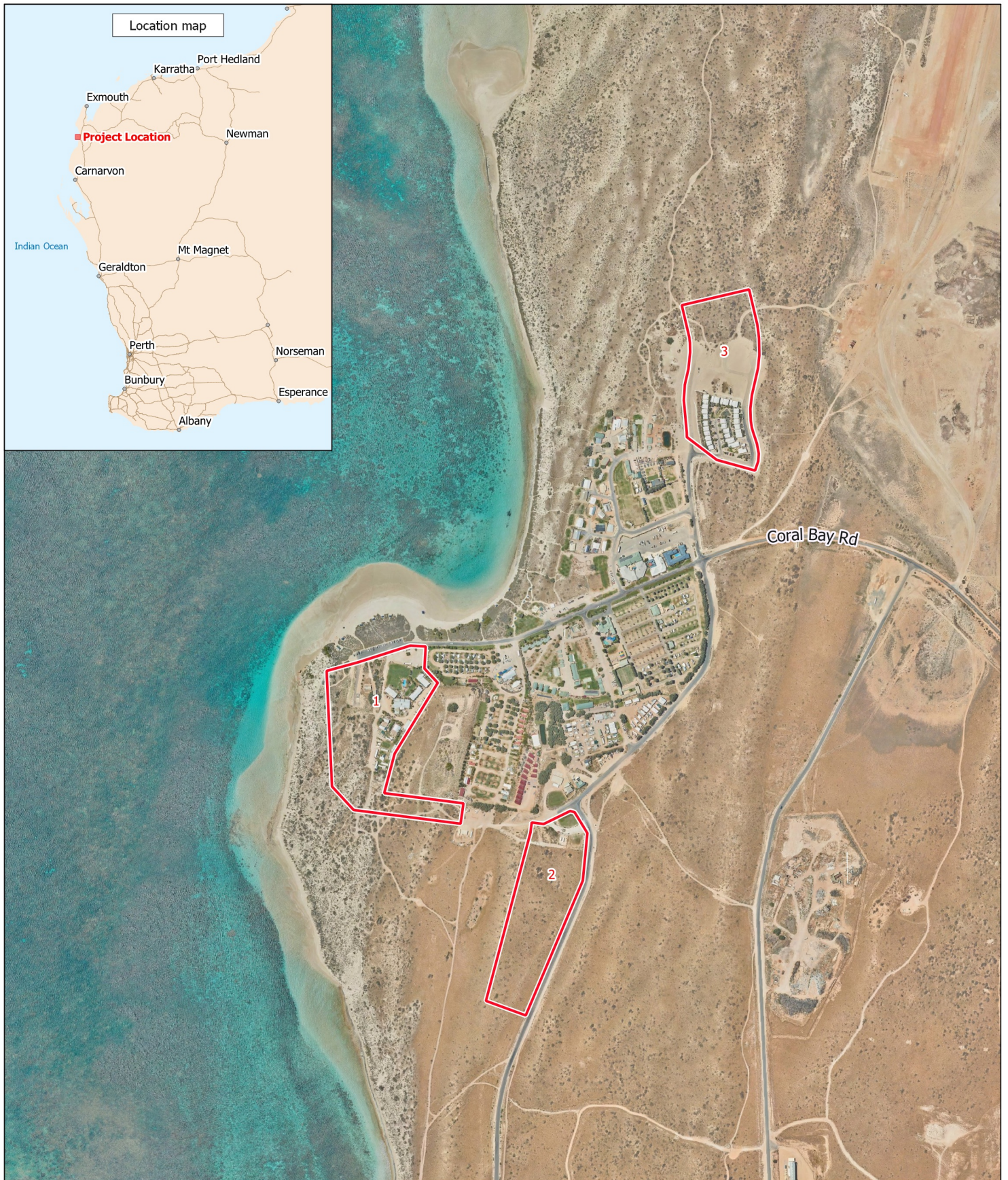
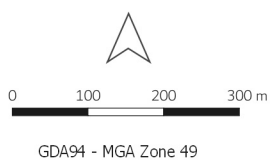


Figure 1: Site Location



Legend
 Site boundary



1.3 Legislative context

Fauna in Western Australia is protected formally and informally by various legislative and non-legislative measures, which are as follows:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) – Australian Government
- *Biodiversity Conservation Act 2016* (BC Act) – State.

Non-legislative measures:

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

A short description of each is given below. Other definitions, including species conservation categories, are provided in Appendix 1.

EPBC Act

The EPBC Act aims to protect matters of national environmental significance, which are detailed in Appendix 1. Under the EPBC Act, the Commonwealth Department of the Environment and Energy (DEE) lists protected species and Threatened Ecological Communities (TECs) by criteria set out in the Act. Species are conservation significant if they are listed as Threatened (i.e. Critically Endangered, Endangered and Vulnerable) or Migratory.

Bird species protected as Migratory under the EPBC Act include those listed under international migratory bird agreements relating to the protection of birds, which migrate between Australia and other countries, for which Australia has agreed. This includes the Japan-Australia Migratory Bird Agreement (JAMBA), the China-Australia Migratory Bird Agreement (CAMBA), the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA) and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

Some marine fauna or terrestrial fauna that use marine habitats are listed as Marine under the EPBC Act. These species are only considered conservation significant when a proposed development occurs in a Commonwealth marine area (i.e. any Commonwealth Waters or Commonwealth Marine Protected Area). Outside of such areas, the EPBC Act does not consider these species to be matters of national environmental significance, so are not protected under the Act.

BC Act

The *Biodiversity Conservation Act 2016* replaced both the *Wildlife Conservation Act* and the *Sandalwood Act* and came into effect on 1 January 2019. The aim of the new Act is to conserve and protect biodiversity and to promote the ecologically sustainable use of biodiversity components in the State, and will bring more activities within the scope of biodiversity laws.

Taxa listed as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1a, 1b, and 1c), or is a rediscovered species to be regarded as threatened species under section 26(2) of the Biodiversity Conservation Act 2016 (BC Act). Other categories include extinct or extinct in the wild and they are listed under section 23 (1) of the BC Act (Appendix 1).

If species meet one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection, they are covered under section 13(1) of the BC Act and are called specially protected species. Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act can't also be listed as Specially Protected species (see Appendix 1 for a more detailed description of each threat category).

Threatened Ecological Communities (TECs) are also covered under the Biodiversity Conservation Act 2016 (BC Act) and are placed into three categories of critically endangered, endangered or vulnerable under section 27(1a, 1b, and 1c) of the BC Act depending on their threat status.

DBCA Priority Species and Communities

DBCA lists species that are possibly threatened but that do not meet criteria for listing under the BC Act, or are otherwise data deficient, and adds them to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Consideration of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations (see Appendix 1 for more detail of the priority codes).

The DBCA also has a list of Priority Ecological Communities (PECs) that have scant information available to be considered a TEC, or which are rare but not currently threatened. Ecological communities that do not meet survey criteria or that are not sufficiently defined are added to the PEC list under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community, and evaluation of conservation status, so that consideration can be given to their declaration as a TEC. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for near threatened, or that have been recently removed from the threatened list, are placed in priority 4. These ecological communities require regular monitoring. Conservation dependent ecological communities are placed in priority 5.

Informal Recognition of Threatened Fauna

Certain populations or communities of fauna may be of local significance or interest because of their patterns of distribution and abundance. For example, fauna may be locally significant because they are range extensions to the previously known distribution or are newly discovered species (and have the potential to be of conservation significance). In addition, many species are in decline as a result of threatening processes (land clearing, grazing, and changed fire regimes) and relict populations of such species assume local importance for DBCA. It is not uncommon for DBCA to make comment on these species of interest.

1.4 Bioregions and Climate

Bioregions

The Biogeographic Regionalisation of Australia (IBRA7) divides Australia into 89 bioregions based on major biological, geographical and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (DEE 2016). Coral Bay sits within the Carnarvon 1 subregion (Cape Range subregion) which forms part of the Carnarvon Bioregion.

The Carnarvon bioregion has a low and gently undulating landscape with open drainage. Vegetation is mainly acacia shrublands and saltbush/bluebush shrublands, with areas of tussock grassland in the north and rugged limestone (notably those of the Cape Range). Dune fields are widespread in this bioregion and there are a number of offshore Island groups, for example Exmouth Gulf, Barrow and Montebello groups (Kendrick & Mau 2002). Major land tenure is pastoral leasehold, with some conservation reserves, such as the Cape Range National Park. The bioregion has a range of industries, including extensive cattle and sheep grazing, salt mining, tourism and fishing (Bastin 2008).

Climate

The climate in the Coral Bay region is arid, semi-desert to subtropical, with variable summer and winter rainfall. Cyclonic activity can be significant, and cyclonic systems may affect the coast and hinterland annually. The nearest and most relevant Bureau of Meteorology (BoM) weather station is Cardabia Homestead (Station No. 006009), approximately 5 km north-east of Coral Bay. The annual long-term average (1913 – 2019) rainfall is 225.7 mm, noting that there have been a number of recent years where no complete rainfall data for the year has been recorded (BoM 2019). In the year proceeding the survey there was 240.5 mm of rain recorded at Cardabia Homestead (Figure 2). However, up until the survey was conducted (at the beginning of April 2019) there has been no rainfall recorded for the period January through to March.

There are no temperate records for the Cardabia Homestead BoM weather station. The nearest BoM weather station to Coral Bay with long-term temperature records is Learmonth, approximately 100 km north-east. The warmest month is January with a mean maximum temperate of 38°C and the coolest month is July with a mean maximum temperate of 24.3°C.

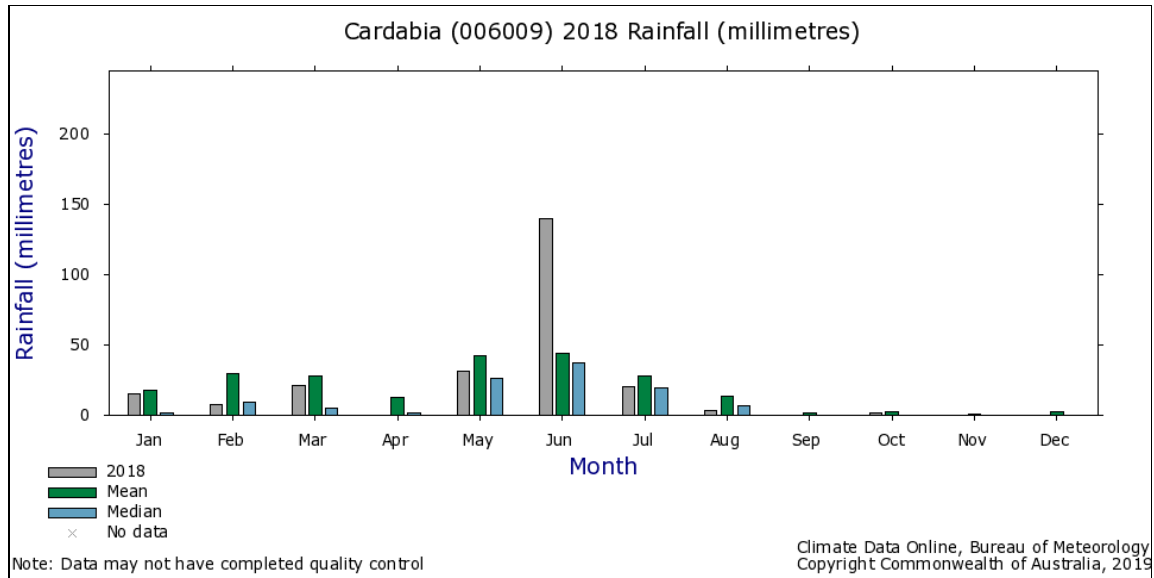


Figure 2. Rainfall data for 2018 at Cardabia Homestead (taken from BoM Climate Data Online).

2. Methods

2.1 Database search

Searches of DBCA NatureMap and the EPBC Protected Matters Search Tool (EPBC PMST) were undertaken to identify fauna species of conservation significance potentially occurring in and near Coral Bay (DBCA 2019, DEE 2019) (Appendix 2). Searches (10 km radial search) were centred on the following coordinates 23° 08' 35" S and 113° 46' 22" E.

Collectively, these sources were used to compile a list of species that have been previously recorded in the vicinity of Coral Bay (Appendix 3). This list invariably includes some species that do not occur in the database search area, as some fauna have a limited or patchy distribution or a high level of habitat specificity for habitats which are not located in the Survey Area e.g. sea birds, wading birds and shorebirds that require coastal shores for habitat, as well as marine reptiles and mammals. Some fauna may also have become locally extinct or were erroneously identified in previous surveys. This fauna was examined and then mostly excluded from further consideration, apart from some additional context and justification for excluding these groups (see Results and Discussion sections).

2.2 Field Assessment

The field assessment was undertaken over two days (including return travel to Coral Bay from Perth via plane and car) from the 2 – 3 April 2019 by one qualified Zoologist. The field assessment was consistent with standard protocols for the region and relevant EPA Guidance Statements, where relevant and practical and as outlined below:

- Technical Guidance – Sampling methods for terrestrial vertebrate fauna (EPA 2016)
- Technical Guide – Terrestrial vertebrate fauna surveys for environmental impact assessment (EPA-DEC 2010)

Please note that the EPA technical guidance, sampling methods for terrestrial vertebrate fauna (2016) mentioned above has not been updated to reflect the EPA's framework for environmental considerations in environmental impact assessment and is still the same document as the technical guide also outlined above.

Habitat assessment

Habitat assessments were undertaken in the proposed development footprint throughout the Survey Area i.e. in all three sites. These fauna habitats were assessed for their potential to support species of conservation significance and the quality of habitat they provide to a wider suite of fauna. The habitat assessments were documented systematically for each habitat type on standardised field sheets. The habitat assessments consisted of the following:

- location of the broad habitat type within the Survey Area (GPS co-ordinate) and its relative percentage
- habitat condition was assessed at each habitat site as 'completely degraded' through to 'pristine', based on the scale given in Keighery (1994)
- landscape position
- dominant vegetation and structure (e.g. number of vegetation strata)
- hollow-bearing trees and dead stags (e.g. average size and abundance of hollows)
- description of any rock and rocky outcrops
- logs (e.g. abundance and size)
- substrate (e.g. leaf litter)
- wetlands, creeks, rivers, dams and other water bodies
- description of any observed nests and roosts (if present)
- subterranean roosts (e.g. caves, disused mineshafts and/or adits)
- associated fauna species observed using the habitat
- disturbance (e.g. cattle grazing, fire)
- photo showing a typical example of the broad habitat type.

A total of six habitat assessments were undertaken and are presented in Appendix 4.

Opportunistic fauna observations

Fauna observations were recorded opportunistically throughout the survey. The assessment included looking through leaf litter, overturning rocks, and looking under decorticated bark if present. Other recordings included visual sightings of active fauna such as reptiles and birds, signs of species presence such as burrows and scats of mammals and reptiles, and aural observations of amphibian and bird species (should suitable habitat be present).

Taxonomy

For species identified in the desktop assessment, where there is doubt to their true taxonomy (through subsequent name changes or taxonomic reviews), an effort was made to determine the current scientific name for each taxon. In some cases, old scientific names were presented where correct nomenclature could not be determined due to name changes. Some taxon names may be followed by 'sp.', meaning that the species name was not given in the data source or the identification is in doubt. Where there are previously recorded taxa such as this that have the potential to be a conservation significant species, they are discussed specifically in the results and discussion sections.

Taxonomy and nomenclature in this report follows the accepted listing of published terrestrial vertebrate species. The listing for amphibians and reptiles is consistent with Cogger (2014); bird listings are consistent with Christidis & Boles (2008) and mammal listings are consistent with Woinarski *et al.* (2014). However, since these publications are several years old there has been some changes to the taxonomy i.e. revisions and new species described, consequently, we then refer to the most recent Western Australian Museum vertebrate checklist which is April 2019.

3. Results

3.1 Fauna survey limitations

Survey limitations are sometimes difficult to predict prior to undertaking the assessment, as is the extent to which they influence survey effort. The limitations of the fauna survey are outlined below in Table 1.

Table 1: Limitations associated with the survey

Limitations	Impact on the assessment
Timing - weather, season	The field assessment was undertaken at the beginning of April 2019 when maximum temperatures were still in the low to mid 30s and minimum temperatures are still in the low 20s. Mean maximum temperatures for the month of March and April are 36.5°C and 33.3°C respectively, while mean minimum temperatures for March and April are 23.0°C and 20.4°C respectively (BoM 2019). Please note there are no temperate records for the Cardabia Homestead BoM weather station which is 5 km north-east of Coral Bay. The nearest BoM weather station to Coral Bay with long-term temperature records is Learmonth, approximately 100 km north-east. No rainfall had been recorded at the Cardabia Homestead BoM weather station in the three months preceding the field assessment i.e. January to March 2019 (BoM 2019). In the year proceeding the survey there was 240.5 mm of rain recorded at Cardabia Homestead (BoM 2019). This is a little more than the annual long-term average (1913 – 2019) of 225.7 mm. Please note that the primary aim of the field assessment was to describe and delineate fauna habitats in the survey area and this can be done at any time of the year i.e. the weather and season are mostly irrelevant.
Scope - Life forms sampled	The primary objective of the assessment (which was undertaken as a level 1 assessment) was to undertake relevant database searches and then in the field describe and delineate the main habitats and make opportunistic observations of terrestrial vertebrates – this was achieved.
Sources of information	The desktop assessment used several databases to produce a list of fauna species previously recorded in the vicinity of Coral Bay. This includes records from NatureMap (DBCA 2019) and the EPBC Protected Matters Search Tool (DEE 2019). Field guides and other scientific literature were also used where relevant. No past publicly available fauna reports for Coral Bay or its surrounds were located.
Completeness	The primary objective of the assessment (which was undertaken as a level 1 assessment) was to undertake relevant database searches and then in the field describe and delineate the main habitats and make opportunistic observations of terrestrial vertebrates (reconnaissance survey). Then based on database search results and the reconnaissance survey (habitats present and their levels of disturbance) assess the likelihood of species of conservation significance occurring in the survey area (proposed development footprint). This was achieved.
Disturbance	The three sites are adjacent to Coral Bay and as such vegetation in some sections has been removed and disturbed by human activities including buildings, a fuel station, rubbish and vehicle tracks. Other disturbance includes the very invasive weed Buffel grass (<i>Cenchrus ciliaris</i>), which dominates the ground layer vegetation and is widespread across all three sites.

3.2 Database results

The database searches returned a total of 186 vertebrate species from 68 families (Appendix 3). These were comprised of 37 reptile species from nine families, 122 bird species from 46 families, and 27 mammal species from 13 families. No amphibian species were present in the database searches.

A total of 79 conservation significant vertebrate species (including Priority species) from 23 families were identified during the desktop review of the database searches (Appendix 3). These were comprised of 13 reptile species from three families, 51 bird species from 15 families, and 15 mammal species from five families.

Please note that no past publicly available fauna reports for Coral Bay or its surrounds were located.

Marine reptiles

A number of marine reptiles (Sea snakes and Turtles) were also present in the database searches, mainly the EPBC PMST (Appendix 2). Site 1 is about 30 m from the high tide mark at its closest point. The other two survey sites (site 2 and 3) are

about 250 m at their closest point inland from the ocean and so do not contain marine habitat or nesting habitat suitable for these species (this will be further elaborated on in section 4 - the discussion).

Seabirds, Shorebirds and Waterbirds

A number of seabirds, shorebirds and waterbird species were returned in the database searches because the survey area or one site (site 1) is adjacent to the coast (about 30 m away at its closest point) and the other two sites (site 2 and 3) are very close (about 250 m away at their closest point) to the coast at Coral Bay (Figures 3, 4 and 5). These birds either spend most of their time far off shore (seabirds), or they forage on mudflats, saltmarshes, sandflats and beaches, with shallow water edges, where they feed for example on invertebrates such as worms, molluscs, insects and crustaceans (Garnett *et al.* 2011). These habitats are not present in any of the three sites at Coral Bay, therefore, these species have been omitted from any further discussion.

Marine mammals

A number of marine mammals (dugong, whales and dolphins) were present in the database searches, mostly in the EPBC PMST. The survey area is on land and so does not contain marine habitat, as such, these species have been omitted from any further discussion.

Database errors and anomalies

Occasionally there are errors and/or anomalies in the database searches that are sourced from the various government departments. For example, the Grey Wagtail (*Motacilla cinerea*), which is a rare visitor with only a few records, of which most come from near Broome or on the south coast of WA (Johnstone & Storr 1998). Another example is the Yellow Wagtail (*Motacilla flava*) which is a wet season visitor to northern Australia. The habitat requirements of the Yellow Wagtail are highly variable, but typically include open grassy flats near water (DotE 2015). These species have been omitted from any further discussion.

It is important to note, that the EPBC PMST is not entirely based on point records, but also on broader information, including bioclimatic distribution models. Whereas DBCAs NatureMap is based on point records. Consequently, the results of the EPBC PMST are in some cases less accurate, particularly at a local scale. As a result, the EPBC PMST can include species that do not occur in the survey area because, for example, there is no habitat available or they are now known to be locally extinct. These species have therefore been omitted from any further discussion.

In addition, many fauna are not distributed evenly across the landscape, are more abundant in some places than others, and consequently more detectable (Currie 2007). Furthermore, some small, common ground-dwelling reptile and mammal species tend to be habitat specific, and many bird species can occur as regular migrants, occasional visitors or vagrants. Therefore, all these species have been excluded from any further discussion.

3.3 Conservation significant fauna

With the above-mentioned species removed, a total of seven conservation significant species retrieved from the database searches are considered as either recorded, likely, possible or unlikely to occur in the survey area. Of these seven conservation significant species, two species are considered Likely to occur in the survey area, and five species are considered Unlikely to occur (Table 2). All seven conservation significant species will be discussed below in section 4.

The Likelihood of each species is based on the following criteria:

- Recorded: Recorded during the field survey or site reconnaissance
- Likely: Suitable habitat is present in the survey area and the survey area is in the species' known distribution
- Possible: Limited or no suitable habitat is present in survey area, but is nearby. The species has good dispersal abilities and is known from the general area
- Unlikely: No suitable habitat is present in survey area but is nearby, the species has poor dispersal abilities, but is known from the general area; or suitable habitat is present, however, the survey area is outside of the species' known distribution.

Table 2. Conservation significant fauna potentially occurring in the survey area.

En = Listed as Endangered under the EPBC Act and BC Act, Vu = Listed as Vulnerable under the EPBC Act and BC Act, Mi = Listed as Migratory under the EPBC Act and BC Act, Ma = Listed as Marine under the EPBC Act and OS = Other specially protected species under the BC Act. Both the EPBC Act and BC Act use IUCN threat categories to determine the threat status and category of species.

Common name	Species name	EPBC Act	BC Act	Likelihood
Birds				
Forked-tailed Swift	<i>Apus pacificus</i>	MiMa	Mi	Likely
Osprey	<i>Pandion cristatus</i>	MiMa	Mi	Unlikely
White-bellied Sea-eagle	<i>Haliaeetus leucogaster</i>	Ma		Unlikely
Peregrine Falcon	<i>Falco peregrinus</i>		OS	Unlikely
Night Parrot	<i>Pezoporus occidentalis</i>	En	En	Unlikely
Barn Swallow	<i>Hirundo rustica</i>	MiMa	Mi	Likely
Mammals				
Pilbara Leaf-nosed Bat	<i>Rhinioncteris aurantia</i>	Vu	Vu	Unlikely

3.4 Field survey results

Amphibians

No amphibians were recorded during the field survey (Appendix 3).

Reptiles

During the reconnaissance field survey, two reptile species were recorded, a *Ctenophorus* sp. which could not be identified to species level as several were seen scurrying away when walking through the sites. Goanna burrows and tracks were recorded in site 2 during the assessment and based on database search results, habitat present (dunes) and the location it was most likely made by the Sand Goanna (*Varanus gouldii*) (Appendix 3). Agamid burrows were also recorded in site 2 and 3.

Birds

During the field survey 17 bird species from 14 families were recorded. The most commonly recorded species across the three sites was the Zebra Finch (*Taeniopygia guttata*) – it was recorded at site 1 and 3. Only six of the 17 bird species were recorded in the three sites, the remaining 11 species were seen incidentally around Coral Bay while moving between the sites (Appendix 3).

Mammals

During the field survey only one mammal species was recorded – the Red Kangaroo (*Macropus rufus*). The Red Kangaroo was recorded at all three sites during the assessment, either directly (sites 1 and 2) or indirectly (scats) at site 3.

3.5 Fauna habitat

During the field survey six fauna habitat assessments were undertaken across the three separate sites at Coral Bay (Figures 3, 4 and 5, Appendix 4). Only one and the same fauna habitat type was described in each of the three sites – dune habitat. The dominant flora species present, as well as the extent of the habitat type in each site is presented in Table 3 below and can be seen in Figures 3, 4 and 5. The numerous habitat variables measured at each habitat assessment site can be seen in Appendix 4. See plate 1 below for an example of the dune habitat present in the survey area.

Each of the three sites also had areas that were either cleared of native vegetation, had non-native vegetation, buildings, roads and tracks and a non-manned fuel station and these were placed into the category of cleared.



Plate 1. An example of dune habitat from site 2 at Coral Bay.

Table 3. Fauna habitat types and their extent in each of the three assessment sites at Coral Bay

Site	Fauna habitat type	Dominant flora species	Extent in each site (ha)	Extent in each site (%)
1	Dune	<i>Acacia coriacea</i> , <i>Cenchrus ciliaris</i> , <i>Spinifex longifolius</i> , <i>Carpobrotus sp.</i>	2.73	54
	Cleared	No vegetation and or no native vegetation	2.35	46
	Total area		5.08	100
2	Dune	<i>Acacia coriacea</i> , <i>Cenchrus ciliaris</i>	3.43	85
	Cleared	No vegetation and or no native vegetation	0.61	15
	Total area		4.04	100
3	Dune	<i>Acacia coriacea</i> , <i>Cenchrus ciliaris</i>	1.14	27
	Cleared	No vegetation and or no native vegetation	3.06	73
	Total area		4.2	100



Figure 3: Site 1 Fauna Habitat



Legend

- | | |
|--|--|
| ■ Habitat Assessment | Vegetation Type |
| Site boundary | Cleared |
| Cadastre | Dune |



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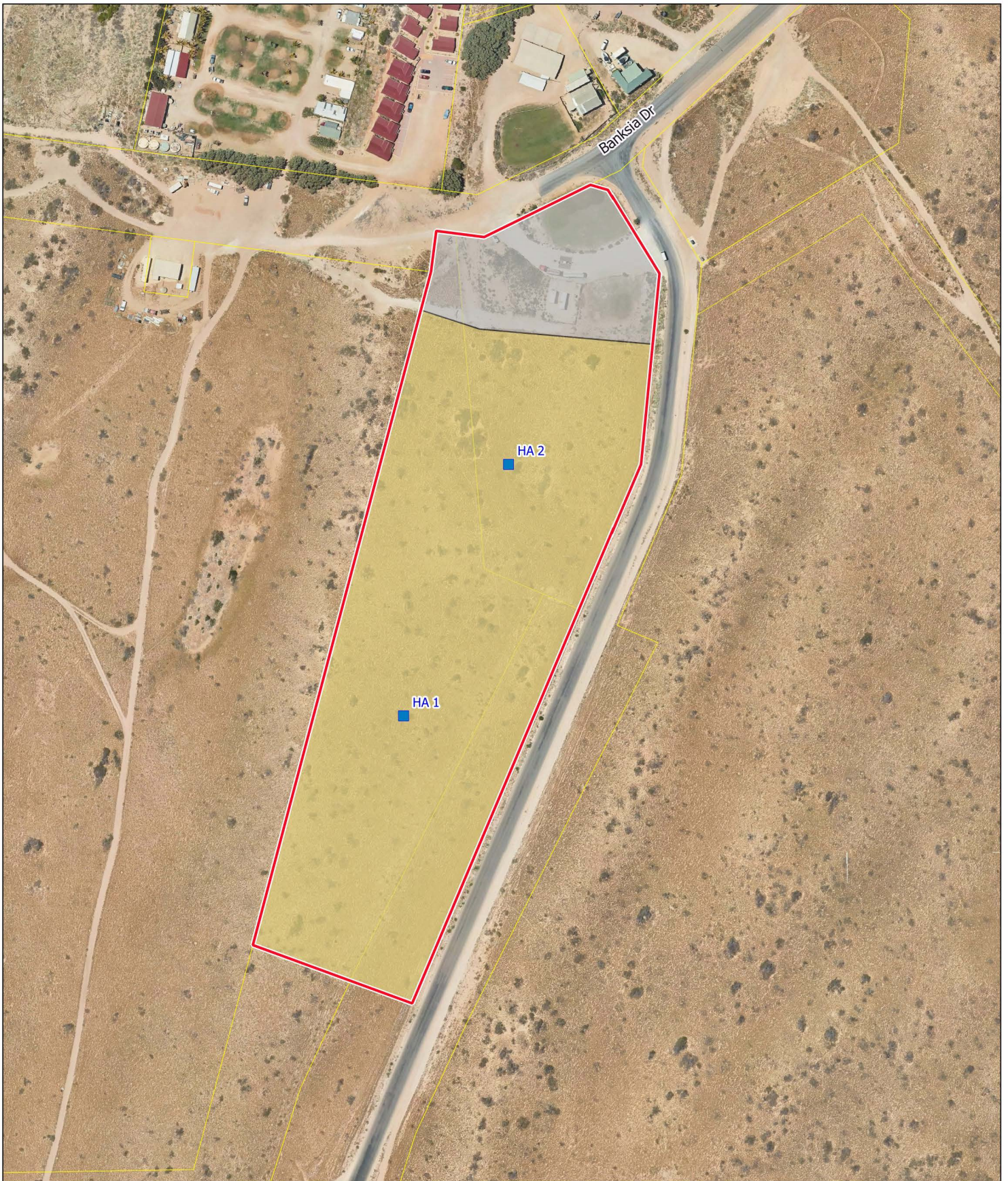
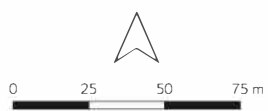


Figure 4: Site 2 Fauna Habitat



GDA94 - MGA Zone 49

Legend

- | | |
|--|--|
| ■ Habitat Assessment | Vegetation Type |
| Site boundary | Cleared |
| Cadastre | Dune |



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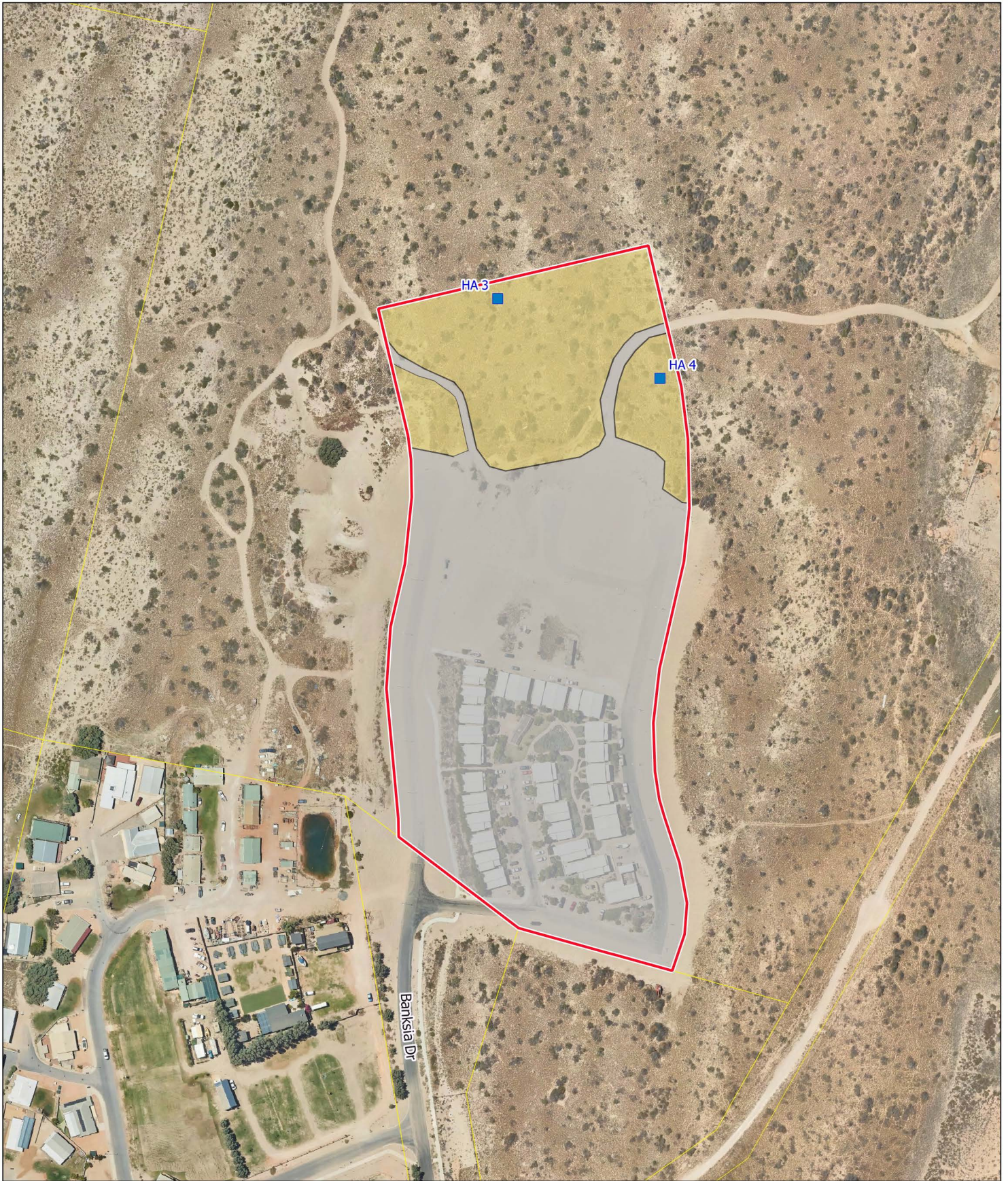


Figure 5: Site 3 Fauna Habitat



Legend

- | | |
|--|---|
| ■ Habitat Assessment | Vegetation Type |
| Site boundary | Cleared |
| Cadastre | Dune |



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4. Discussion

4.1 Conservation significant fauna

A total of seven conservation significant species retrieved from the database searches are considered as either Likely or Unlikely to occur in the survey area. All seven conservation significant species will be discussed further below.

4.1.2 Species Considered Likely to Occur

Two species are considered Likely to occur in the survey area: the Fork-tailed Swift and the Barn Swallow.

Fork-tailed Swift

The Fork-tailed Swift is listed as Migratory and Marine under the EPBC Act and Migratory under the BC Act. It is a non-breeding visitor to all states and territories of Australia (Higgins 1999). The Fork-tailed Swift is a summer migrant to Australia usually during the months of October-April. The Fork-tailed Swift is an aerial species which forages high above the tree canopy and is independent of terrestrial habitats. It occurs in flocks of up to 2,000 birds and is often seen accompanying Tree Martins (*Petrochelidon nigricans*) and Masked Wood swallows (*Artamus personatus*) (Johnstone & Storr 1998).

The Fork-tailed Swift was present in the NatureMap and EPBC PMST databases. While the species will not be reliant on the dune habitat in each of the three sites at Coral Bay, it is likely to visit them as part of its larger foraging home range.

Barn Swallow

The Barn Swallow is listed as Migratory and Marine under the EPBC Act and Migratory under the BC Act. The Barn Swallow is a widespread house swallow of the northern hemisphere, visiting coastal northern Australia south to Learmonth and appears as a vagrant further south. It forages on the wing taking insects and inhabits open country, agricultural land, especially near towns and wetlands including sewage and saltworks ponds, river pools, swamps, tidal creeks and reservoirs (Johnstone & Storr 1998).

The Barn Swallow was present in the NatureMap and EPBC PMST databases. There are also sewage ponds about 3 km east of Coral Bay, therefore this species is likely to forage above the dune habitat of the three sites, but will not be reliant on it.

4.1.3 Species Considered Unlikely to Occur

Five species are considered unlikely to occur in the survey area: Osprey, White-bellied Sea-eagle, Peregrine Falcon, Night Parrot and Pilbara Leaf-nosed Bat.

Osprey and White-bellied Sea-eagle

The Osprey is listed as Migratory and Marine under the EPBC Act and Migratory under the BC Act. The White-bellied Sea-eagle is listed as Marine under the EPBC Act. Both these birds require coasts and near-coastal wetland habitat, where they feed mainly on fish, sea snakes and nesting seabirds (Johnstone & Storr 1998). These two species were both present in the NatureMap and EPBC PMST databases. However, all three sites are situated in dune habitat that is not suitable for foraging, roosting or breeding as there are no trees or rocky cliff faces where they can perch or build nests.

Peregrine Falcon

The Peregrine Falcon is listed as OS under the BC Act and it was present in the NatureMap database. It is an uncommon but wide-ranging bird across Australia (Barrett *et al.* 2003). It occurs mainly along rivers and ranges as well as wooded watercourses and lakes and nests primarily on cliffs, granite outcrops and quarries. The diet of the Peregrine Falcon has been well studied and primarily includes flocking species such as Parrots, Pigeons and on the east coast European Starlings (*Sturnus vulgaris*) (Olsen & Fuentes 2008). The survey area lacks suitable cliff and rock outcrop habitat, rivers and watercourses and so lacks any suitable nesting and foraging habitat.

Night Parrot

The Night Parrot is listed as Endangered under the EPBC Act and BC Act. It is an enigmatic species thought possibly to be extinct until the recent recoveries of two dead specimens from Queensland (and new locations more recently). The type specimen and many early sightings, however, came from WA (Johnstone *et al.* 2013). Night Parrots are cryptic, nocturnal and endemic to Australia's arid interior. Until the late 19th century, they were widespread and relatively easily found at least at some locations. For instance, 14 of the 25 museum specimens in existence came from the Gawler Ranges in South Australia between 1871 and 1881 (Murphy *et al.* 2017). The last Night Parrot collected intentionally was in Western Australia in 1912 (Wilson 1937). Then followed 78 years of unconfirmed reports spanning all mainland states and the Northern Territory, until in 1990 a desiccated bird was found by a roadside in western Queensland (Boles *et al.* 1994, Murphy *et al.* 2017). In 2006, another dead bird was discovered by a Ranger 200 km to the south-east of the 1990 specimen (McDougall *et al.* 2009, Murphy *et al.* 2017). In 2013, the first photographs of a living night parrot were captured close to the site of the 2006 specimen (Dooley 2013, Murphy *et al.* 2017). Their cryptic nature, remote distribution and apparently rapid decline mean that there is scant ecological information about night parrots.

A more recent sighting of the Night Parrot in WA comes from the Pilbara (12 April 2005) at a well near the Fortescue Marshes (Davis & Metcalf 2008). There was also a sighting near Matuwa (Lorna Glen), north-east of Wiluna, in 2009 (Hamilton *et al.* 2017).

This species was present in the EPBC PMST database. There is very limited ecological information available for this species such as its preferred habitat (only very broad information). However, with increasing conservation focus being given to this species, more information is likely to become available, e.g. the discovery of Night Parrot nests in large Spinifex hummocks in Queensland (Murphy *et al.* 2017) which is a common and widespread habitat type throughout much of south-east Queensland and WA.

There is no suitable habitat in the form of large spinifex hummocks in the survey area, therefore this species is unlikely to occur.

Pilbara Leaf-nosed Bat

The Pilbara Leaf-nosed Bat (PLNB) is listed as Vulnerable under the EPBC Act and BC Act and was present in the EPBC PMST database. The PLNB is dependent on caves and mines with very hot and humid roost sites (28-320C and 96-100% humidity) during the dry season (Armstrong 2000; Churchill 2008). Caves and mines, which have these specific characteristics, are relatively uncommon in the Pilbara. Without these conditions, PLNB are susceptible to dehydration and hypothermia and can die within a few hours.

The PLNB is now known to be more widespread than previously supposed; however, most of its maternity roost sites are confined either to banded ironstone strata that may be mined or to underground mine adits that are now collapsing or being open cut (Woinarski *et al.* 2014).

There is no suitable habitat such as caves, mines and mine adits for the PLNB to roost in during the day or watercourses that they can drink free water from in the survey area or nearby surrounds. As such the PLNB is considered unlikely to occur.

4.2 Fauna habitat

During the assessment only one fauna habitat type was identified across all three sites – dune habitat. The sites were depauperate in birds which are generally recorded in relatively high numbers during level 1 assessments. The remaining vertebrate groups (reptiles and mammals) are primarily sampled during level 2 surveys that employ trapping. However, very few reptiles such as those that belong to families in the Agamid (Dragon lizards) and Skink groups were not observed and they typically are during level 1 assessments. Though a couple of *Ctenophorus* sp. (dragons) were recorded and some burrows were also noted.

The relatively low numbers of birds and reptiles observed in all three sites during the field assessment can in part be explained by the following:

- The vegetation at the sites were very dry (see plate 1 above in the results section and photos in Appendix 4) as a result of no recent rainfall. No rainfall was recorded at Cardabia Homestead (nearest BoM weather station) for the first three months of the year (January – March). The mean rainfall for the first three months of the year at Cardabia Homestead is 75.9 mm.
- Vegetation structure, cover and flora species diversity at the three sites was limited and low (see Appendix 4). There are no trees, very few shrubs (primarily scattered Acacia) and therefore almost no cover in the midstorey (which is typically habitat for small passerine birds) and the ground layer was also relatively sparse and consisted primarily of dry Buffel grass.
- Because Buffel grass dominates the ground layer there are no *Triodia* sp. (spinifex) hummocks that you would typically associate with this region. These hummocks typical provide habitat for a diverse group of reptiles in which to shelter.

The most common bird recorded in the three sites was the Zebra Finch. This species is a granivorous specialist so there must have been some seed on the ground for it to feed on. However, these birds also typically drink free water daily and this was probably available around Coral Bay at the caravan park and resort where regular watering of lawns and gardens occurs (green grass was present). More species of birds were recorded in these areas of Coral Bay than in the survey area and this again is most likely the result of the well-watered grass and gardens (more green vegetation for insects and consequently more birds). Other birds that do well as a result of urbanisation, such as the Australian White Ibis were also present at Coral Bay on the green lawns.

A number of marine turtle species were present in the database searches. Site 1 at its closest point is about 30 m from the high tide mark, however, the site is elevated (about 5 to 10 m above sea level) and there is vegetation for about 25 m between the site boundary and the high tide mark. Some sections of beach near site 1 also had a rocky shore (see plate 2 below). Therefore, the site is not suitable for turtles to nest as they typically nest on the beach above the high tide mark – they do not move up into the dunes through vegetation, particularly not when it is elevated.



Plate 2. Photo showing the rocky shore and the elevation of the dune adjacent to site 1 (photo is taken outside of site 1 on the western side facing south).

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APPENDICES



Appendix 1: Conservation Categories

Categories of Threatened Fauna Species under the EPBC Act

Conservation Code	Description
Ex	Extinct Taxa which at a particular time if, at the time, there is no reasonable doubt that the last member of the species has died.
ExW	Extinct in the Wild Taxa which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CE	Critically Endangered Taxa which at a particular time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
En	Endangered Taxa which is not critically endangered and it is facing a very high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
Vu	Vulnerable Taxa which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

Source: Environment Protection and Biodiversity Conservation Act 1999.

DBCA Fauna Priority Codes

Category	Code	Description
Poorly-known species	Priority 1 (P1)	Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Poorly-known species	Priority 2 (P2)	Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
Poorly-known species	Priority 3 (P3)	Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

Category	Code	Description
Poorly-known species	Priority 4 (P4)	<p>(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.</p> <p>(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent.</p> <p>(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>



CONSERVATION CODES

For Western Australian Flora and Fauna

Threatened, Extinct and Specially Protected fauna or flora¹ are species² which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.

The *Wildlife Conservation (Specially Protected Fauna) Notice 2018* and the *Wildlife Conservation (Rare Flora) Notice 2018* have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018* to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the *Biodiversity Conservation Act 2016*.

Categories of Threatened, Extinct and Specially Protected fauna and flora are:

T **Threatened species**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN **Endangered species**

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU **Vulnerable species**

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct species

Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.

EX Extinct species

Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that “*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P **Priority species**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

1 **Priority 1: Poorly-known species**

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

2 **Priority 2: Poorly-known species**

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

3 **Priority 3: Poorly-known species**

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

4 **Priority 4: Rare, Near Threatened and other species in need of monitoring**

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

¹ The definition of flora includes algae, fungi and lichens

² Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).



Appendix 2: Database Searches

NatureMap Species Report

Created By Guest user on 01/04/2019

Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 113° 46' 15" E, 23° 08' 38" S
Buffer 10km
Group By Family

Family	Species	Records
Acanthizidae	2	17
Accipitridae	8	22
Actinopodidae	1	1
Agamidae	6	31
Alaudidae	1	2
Albulidae	1	3
Anatidae	3	5
Apodidae	1	2
Apogonidae	1	6
Araneidae	1	1
Ardeidae	3	3
Atherinidae	1	1
Balaenopteridae	1	4
Blenniidae	4	6
Buthidae	1	1
Campephagidae	1	8
Carangidae	5	5
Carphodactylidae	1	2
Casuariidae	1	1
Chaetodontidae	1	1
Charadriidae	8	42
Cheilodactylidae	1	1
Cheloniidae	1	18
Cinclosomatidae	1	11
Clupeidae	1	1
Columbidae	3	26
Corvidae	2	16
Cracticidae	2	16
Dasyuridae	1	1
Delphinidae	1	2
Dicruridae	3	31
Diplodactylidae	3	27
Elapidae	4	7
Elopidae	1	1
Estrilidae	2	23
Falconidae	3	28
Gekkonidae	2	10
Gobiidae	1	81
Hadziidae	1	1
Haematopodidae	2	19
Halcyonidae	1	1
Hemiramphidae	1	1
Hirundinidae	4	53
Kyphosidae	2	2
Labridae	4	5
Lamponidae	1	1
Laridae	12	120
Lethrinidae	1	1
Lycosidae	1	1
Macropodidae	1	4
Maluridae	3	37
Meliphagidae	4	23
Meropidae	1	5
Microcanthidae	1	2
Mugilidae	1	1
Muridae	2	8
Nicodamidae	1	3
Otididae	1	5
Pachycephalidae	1	1
Pelecanidae	1	3
Phaethontidae	1	1
Phalacrocoracidae	4	27
Phasianidae	1	1
Podicipedidae	1	1
Pomacentridae	1	3
Pristidae	1	1
Procellariidae	1	1
Psittacidae	4	7
Pygopodidae	1	2
Rallidae	1	1
Recurvirostridae	1	6
Salticidae	1	1
Scincidae	6	15
Scolopacidae	11	49
Scorpaenidae	1	1

Sillaginidae	2	2
Sphyraenidae	1	1
Sulidae	1	1
Synodontidae	1	1
Tetraodontidae	2	2
Threskiornithidae	1	2
Turnicidae	1	1
Ziphiidae	2	2
Zosteropidae	2	6
TOTAL	180	896

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Acanthizidae				
1.	24269 <i>Calamanthus campestris</i> (Rufous Fieldwren)			
2.	24278 <i>Pyrrholaemus brunneus</i> (Redthroat)			
Accipitridae				
3.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
4.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
5.	24288 <i>Circus approximans</i> (Swamp Harrier)			
6.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
7.	<i>Elanus axillaris</i>			
8.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
9.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
10.	48591 <i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
Actinopodidae				
11.	<i>Missulena occatoria</i>			
Agamidae				
12.	30831 <i>Amphibolurus gilberti</i> (Ta-ta, Gilbert's Dragon)			
13.	30833 <i>Amphibolurus longirostris</i> (Long-nosed Dragon)			
14.	24868 <i>Ctenophorus clayi</i> (Collared Dragon)			
15.	24877 <i>Ctenophorus maculatus</i> subsp. <i>badius</i> (Spotted Military Dragon)			
16.	30897 <i>Ctenophorus parviceps</i> (Western Heath Dragon, Northern Heath Dragon)			
17.	24904 <i>Moloch horridus</i> (Thorny Devil)			
Alaudidae				
18.	25545 <i>Mirafra javanica</i> (Horsfield's Bushlark, Singing Bushlark)			
Albulidae				
19.	<i>Albula forsteri</i>			
Anatidae				
20.	24312 <i>Anas gracilis</i> (Grey Teal)			
21.	24322 <i>Cygnus atratus</i> (Black Swan)			
22.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
Apodidae				
23.	25554 <i>Apus pacificus</i> (Fork-tailed Swift, Pacific Swift)		IA	
Apogonidae				
24.	<i>Apogon cookii</i>			
Araneidae				
25.	<i>Argiope protensa</i>			
Ardeidae				
26.	41324 <i>Ardea modesta</i> (great egret, white egret)			
27.	24343 <i>Ardea sacra</i> subsp. <i>sacra</i> (Eastern Reef Egret, Eastern Reef Heron)			
28.	<i>Egretta novaehollandiae</i>			
Atherinidae				
29.	<i>Atherinomorus vaigiensis</i>			
Balaenopteridae				
30.	24051 <i>Megaptera novaeangliae</i> (Humpback Whale)		S	
Blenniidae				
31.	<i>Istiblennius edentulus</i>			
32.	<i>Istiblennius meleagris</i>			
33.	<i>Omobranchus germaini</i>			
34.	<i>Parablennius postoculomaculatus</i>			
Buthidae				
35.	<i>Urodacus hartmeyerii</i>			
Campephagidae				
36.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
Carangidae				
37.	<i>Carangoides fulvoguttatus</i>			
38.	<i>Carangoides gymnotethus</i>			
39.	<i>Caranx ignobilis</i>			
40.	<i>Elagatis bipinnulatus</i>			
41.	<i>Ulua mentalis</i>			
Carphodactylidae				

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
42.	24968 <i>Nephurus levis</i> subsp. <i>occidentalis</i>			
Casuariidae				
43.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
Chaetodontidae				
44.	<i>Chaetodon lunula</i>			
Charadriidae				
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.	24378 <i>Charadrius veredus</i> (Oriental Plover)		IA	
49.	24379 <i>Erythrogonys cinctus</i> (Red-kneed Dotterel)			
50.	24382 <i>Pluvialis fulva</i> (Pacific Golden Plover)		IA	
51.	24383 <i>Pluvialis squatarola</i> (Grey Plover)		IA	
52.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
Cheilodactylidae				
53.	<i>Cheilodactylus rubrolabiatus</i>			
Cheloniidae				
54.	25336 <i>Chelonia mydas</i> (Green Turtle)		T	
Cinclosomatidae				
55.	24390 <i>Psophodes occidentalis</i> (Western Wedgebill, Chiming Wedgebill)			
Clupeidae				
56.	<i>Spratelloides robustus</i>			
Columbidae				
57.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
58.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
59.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
Corvidae				
60.	24416 <i>Corvus bennetti</i> (Little Crow)			
61.	25593 <i>Corvus orru</i> (Torresian Crow)			
Cracticidae				
62.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
63.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
Dasyuridae				
64.	24091 <i>Dasykaluta rosamondae</i> (Little Red Kaluta)			
Delphinidae				
65.	30954 <i>Tursiops aduncus</i> (Indo-Pacific Bottlenose Dolphin)			
Dicruridae				
66.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
67.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
68.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
Diplodactylidae				
69.	24938 <i>Diplodactylus ornatus</i>			
70.	42414 <i>Lucasium albobuttatum</i>			
71.	24941 <i>Strophurus rankini</i>			
Elapidae				
72.	25292 <i>Demansia calodera</i> (Black-necked Whipsnake)			
73.	25295 <i>Demansia psammophis</i> subsp. <i>cupreiceps</i> (Yellow-faced Whipsnake)			
74.	42416 <i>Pseudonaja mengdeni</i> (Western Brown Snake)			
75.	25267 <i>Simoselaps littoralis</i> (West Coast Banded Snake)			
Elopidae				
76.	<i>Elops hawaiiensis</i>			
Estrilidae				
77.	25685 <i>Neochmia ruficauda</i> (Star Finch)			
78.	30870 <i>Taeniopygia guttata</i> (Zebra Finch)			
Falconidae				
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	
Gekkonidae				
82.	24959 <i>Gehyra variegata</i>			
83.	24961 <i>Heteronotia binoei</i> (Bynoe's Gecko)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Gobiidae				
84.	<i>Bathygobius cocosensis</i>			
Hadziidae				
85.	<i>Nedsia</i> sp.			
Haematopodidae				
86.	25627 <i>Haematopus fuliginosus</i> (Sooty Oystercatcher)			
87.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			
Halcyonidae				
88.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
Hemiramphidae				
89.	<i>Hyporhamphus affinis</i>			
Hirundinidae				
90.	47909 <i>Cheramoeca leucosterna</i> (White-backed Swallow)			
91.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
92.	25630 <i>Hirundo rustica</i> (Barn Swallow)		IA	
93.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
Kyphosidae				
94.	<i>Kyphosus cinerascens</i>			
95.	<i>Kyphosus vaigiensis</i>			Y
Labridae				
96.	<i>Anampses lennardi</i>			
97.	<i>Cheilio inermis</i>			
98.	<i>Choerodon schoenleinii</i>			
99.	<i>Thalassoma septemfasciata</i>			
Lamponidae				
100.	<i>Notsodipus quobba</i>			
Laridae				
101.	25634 <i>Anous stolidus</i> (Common Noddy)		IA	
102.	41332 <i>Chlidonias leucopterus</i> (White-winged Black Tern, white-winged tern)		IA	
103.	<i>Chroicocephalus novaehollandiae</i>			
104.	48587 <i>Hydroprogne caspia</i> (Caspian Tern)		IA	
105.	25638 <i>Larus pacificus</i> (Pacific Gull)			
106.	41347 <i>Onychoprion anaethetus</i> (Bridled Tern)		IA	
107.	25640 <i>Sterna dougallii</i> (Roseate Tern)		IA	
108.	25642 <i>Sterna hirundo</i> (Common Tern)		IA	
109.	48593 <i>Sternula albifrons</i> (Little Tern)		IA	
110.	48594 <i>Sternula nereis</i> (Fairy Tern)			
111.	<i>Thalasseus bengalensis</i>			
112.	48597 <i>Thalasseus bergii</i> (Crested Tern)		IA	
Lethrinidae				
113.	<i>Lethrinus nebulosus</i>			
Lycosidae				
114.	<i>Hogna crispipes</i>			
Macropodidae				
115.	24135 <i>Macropus robustus</i> subsp. <i>erubescens</i> (Euro, Biggada)			
Maluridae				
116.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
117.	24544 <i>Malurus lamberti</i> subsp. <i>assimilis</i> (Variegated Fairy-wren)			
118.	25652 <i>Malurus leucopterus</i> (White-winged Fairy-wren)			
Meliphagidae				
119.	24559 <i>Acanthagenys rufogularis</i> (Spiny-cheeked Honeyeater)			
120.	24564 <i>Certhionyx variegatus</i> (Pied Honeyeater)			
121.	24570 <i>Epthianura tricolor</i> (Crimson Chat)			
122.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
Meropidae				
123.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
Microcanthidae				
124.	<i>Microcanthus strigatus</i>			
Mugilidae				
125.	<i>Liza melinoptera</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Muridae				
126.	24223 <i>Mus musculus</i> (House Mouse)	Y		
127.	24224 <i>Notomys alexis</i> (Spinifex Hopping-mouse)			
Nicodamidae				
128.	<i>Nicodamus mainae</i>			
Otididae				
129.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
Pachycephalidae				
130.	24618 <i>Oreoica gutturalis</i> (Crested Bellbird)			
Pelecanidae				
131.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
Phaethontidae				
132.	24662 <i>Phaethon lepturus</i> (White-tailed Tropicbird)		IA	
Phalacrocoracidae				
133.	<i>Microcarbo melanoleucos</i>			
134.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
135.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
136.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
Phasianidae				
137.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			
Podicipedidae				
138.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
Pomacentridae				
139.	<i>Abudefduf</i> sp.			
Pristidae				
140.	34037 <i>Pristis zijsron</i> (Green Sawfish)		T	
Procellariidae				
141.	48573 <i>Ardenna pacifica</i> (Wedge-tailed Shearwater)		IA	
Psittacidae				
142.	24725 <i>Cacatua roseicapilla</i> subsp. <i>assimilis</i> (Galah)			
143.	24727 <i>Cacatua sanguinea</i> subsp. <i>westralensis</i> (Little Corella)			
144.	24736 <i>Melopsittacus undulatus</i> (Budgerigar)			
145.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
Pygopodidae				
146.	25005 <i>Lialis burtonis</i>			
Rallidae				
147.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			
Recurvirostridae				
148.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
Salticidae				
149.	<i>Hasarius adansoni</i>			
Scincidae				
150.	25046 <i>Ctenotus iapetus</i>			
151.	25090 <i>Cyclodomorphus melanops</i> subsp. <i>melanops</i> (Slender Blue-tongue)			
152.	25133 <i>Lerista elegans</i>			
153.	25148 <i>Lerista lineopunctulata</i>			
154.	25165 <i>Lerista praepedita</i>			
155.	25184 <i>Menetia greyii</i>			
Scolopacidae				
156.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
157.	25736 <i>Arenaria interpres</i> (Ruddy Turnstone)		IA	
158.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
159.	24780 <i>Calidris alba</i> (Sanderling)		IA	
160.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
161.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
162.	24790 <i>Calidris tenuirostris</i> (Great Knot)		T	
163.	24803 <i>Tringa brevipes</i> (Grey-tailed Tattler)		P4	
164.	24806 <i>Tringa glareola</i> (Wood Sandpiper)		IA	
165.	24808 <i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	
166.	41351 <i>Xenus cinereus</i> (Terek Sandpiper)		IA	

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Scorpaenidae				
167.	<i>Pterois volitans</i>			
Sillaginidae				
168.	<i>Sillago sp.</i>			
169.	<i>Sillago vittata</i>			
Sphyraenidae				
170.	<i>Sphyraena jello</i>			
Sulidae				
171.	48008 <i>Morus serrator (Australasian Gannet)</i>			
Synodontidae				
172.	<i>Synodus sageneus</i>			
Tetraodontidae				
173.	<i>Arothron manilensis</i>			
174.	<i>Torquigener pleurogramma</i>			
Threskiornithidae				
175.	24845 <i>Threskiornis spinicollis (Straw-necked Ibis)</i>			
Turnicidae				
176.	24851 <i>Turnix velox (Little Button-quail)</i>			
Ziphiidae				
177.	24077 <i>Mesoplodon densirostris (Blainville's Beaked Whale)</i>			
178.	24081 <i>Mesoplodon mirus (True's Beaked Whale)</i>			
Zosteropidae				
179.	25765 <i>Zosterops lateralis (Grey-breasted White-eye, Silvereye)</i>			
180.	24857 <i>Zosterops luteus (Yellow White-eye)</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

¹ 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: 01/04/19 19:43:11

[Summary](#)

[Details](#)

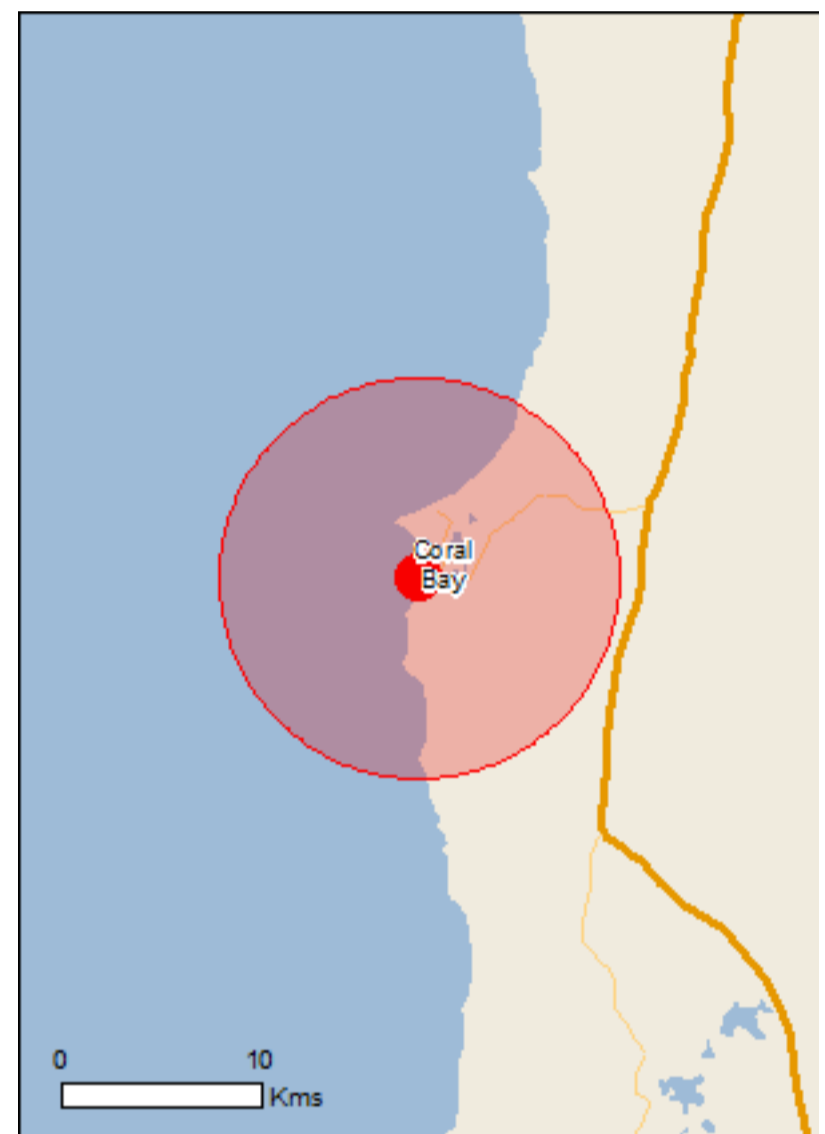
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

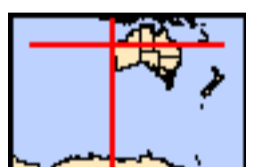
[Acknowledgements](#)



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[Coordinates](#)

[Buffer: 10.0Km](#)



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	26
Listed Migratory Species:	40

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	1
Listed Marine Species:	59
Whales and Other Cetaceans:	14
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	1

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	8
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	1

Details

Matters of National Environmental Significance

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

Name	State	Status
The Ningaloo Coast	WA	Declared property

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

Name	State	Status
Natural		
The Ningaloo Coast	WA	Listed place

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name

EEZ and Territorial Sea

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

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

Name

[North-west](#)

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

Name	Status	Type of Presence
Birds		
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Mammals		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Rhinonictoris aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Aipysurus apraefrontalis Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Sharks		
Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species

Name	Status	Type of Presence
habitat may occur within area		
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Dugong dugon Dugong [28]		Breeding known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area

Name	Threatened	Type of Presence
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat known to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat known to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundo rustica Barn Swallow [662]		Species or species habitat known to occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Heritage Places [\[Resource Information \]](#)

Name	State	Status
Natural		
Ningaloo Marine Area - Commonwealth Waters	WA	Listed place

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

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

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species

Name	Threatened	Type of Presence
Chrysococcyx osculans Black-eared Cuckoo [705]		habitat may occur within area Species or species habitat known to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area
Fish		
Bulbonaricus brauni Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
Doryhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
Festucalex scalaris Ladder Pipefish [66216]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area
Halicampus spirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
Haliichthys taeniophorus Ribbioned Pipehorse, Ribbioned Seadragon [66226]		Species or species habitat may occur within area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
Micrognathus micronotus Tidepool Pipefish [66255]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong [28]		Breeding known to occur within area

Name	Threatened	Type of Presence
Reptiles		
Aipysurus apraefrontalis Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Disteira major Olive-headed Seasnake [1124]		Species or species habitat may occur within area
Emydocephalus annulatus Turtle-headed Seasnake [1125]		Species or species habitat may occur within area
Ephalophis greyi North-western Mangrove Seasnake [1127]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

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

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within

Name	Status	Type of Presence area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat may occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Australian Marine Parks [\[Resource Information \]](#)

Name	Label
Ningaloo	Recreational Use Zone (IUCN IV)

Extra Information

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

Name	State
Unnamed WA37500	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
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area

Plants		
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area

Key Ecological Features (Marine) [\[Resource Information \]](#)

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

Name	Region
Commonwealth waters adjacent to Ningaloo Reef	North-west

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

-23.14369 113.77086

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 3: Fauna Species List

Key: EPBC = Environmental Protection and Biodiversity Conservation Act 1999, BC = Biodiversity Conservation Act 2016 (IUCN Threat categories), DBCA = Department of Biodiversity, Conservation and Attractions Priority Code, A = Listed in Naturemap, B = EPBC Protected Matters search, C = Current Field Survey

Note: For Definitions of Conservation Codes see Appendix A.

REPTILES		Conservation Codes					
Scientific Name	Common Name	EPBC	BC	DBCA	A	B	C
CHELONIIDAE							
<i>Caretta caretta</i>	Loggerhead Turtle	MiMa, En	En			X	
<i>Chelonia mydas</i>	Green Turtle	MiMa, Vu	Vu		X	X	
<i>Eretmochelys imbricata</i>	Hawksbill Turtle	MiMa, Vu	Vu			X	
<i>Natator depressus</i>	Flatback Turtle	MiMa, Vu	Vu			X	
DERMOCHELYIDAE							
<i>Dermochelys coriacea</i>	Leatherback Turtle	MiMa, En	En			X	
CARPHADACTYLIDAE							
<i>Nephrurus levis</i>	Smooth Knob-tailed Gecko				X		
DIPODACTYLIDAE							
<i>Diplodactylus ornatus</i>					X		
<i>Lucasium alboguttatum</i>					X		
<i>Strophurus rankini</i>					X		
GEKKONIDAE							
<i>Gehyra variegata</i>	Tree Dtella				X		
<i>Heteronotia benoei</i>	Bynoe's Gecko				X		
SCINCIDAE							
<i>Ctenotus iapetus</i>	North-west Cape Ctenotus				X		
<i>Cyclodomorphus melanops</i>	Slender Blue Tongue				X		
<i>Lerista elegans</i>	Elegant Slider				X		
<i>Lerista lineopunctulata</i>					X		
<i>Lerista praepedita</i>					X		
<i>Menetia greyii</i>					X		
AGAMIDAE							
<i>Ctenophorus</i> sp.	<i>Ctenophorus</i> sp.						X
<i>Ctenophorus clayi</i>	Collared Dragon				X		
<i>Ctenophorus maculatus</i>	Spotted Military Dragon				X		
<i>Ctenophorus parviceps</i>	Western Heath Dragon				X		
<i>Lophognathus gilberti</i>	Gilbert's Dragon				X		
<i>Gowidon longirostris</i>	Long-nosed Dragon				X		
<i>Moloch horridus</i>	Thorny Devil				X		

REPTILES		Conservation Codes					
Scientific Name	Common Name	EPBC	BC	DBCA	A	B	C
VARANIDAE							
<i>Varanus gouldii</i>	Goulds Sand Monitor						X
ELAPIDAE							
<i>Demansia calodera</i>	Black-necked Whipsnake				X		
<i>Demansia psammophis</i>	Yellow-faced Whipsnake				X		
<i>Pseudonaja mengdeni</i>	Western Brown Snake				X		
<i>Pseudonaja modesta</i>	Ringed Brown Snake						
<i>Simoselaps littoralis</i>	West Coast Banded Snake				X		
<i>Acalyptophis peronii</i>	Horned Sea Snake	Ma					
<i>Aipysurus apraefrontalis</i>	Short-nosed Sea Snake	Cr	Cr			X	
<i>Aipysurus laevis</i>	Olive Sea Snake	Ma				X	
<i>Emydocephalus annulatus</i>	Turtle-headed Sea Snake	Ma				X	
<i>Ephalophis greyi</i>	Mangrove Sea snake	Ma				X	
<i>Hydrophis kingii</i>	Spectacled Sea snake	Ma				X	
<i>Hydrophis major</i>	Olive-headed Sea snake	Ma				X	
<i>Pelamis platurus</i>	Yellow-bellied Sea snake	Ma				X	

[X] fauna species recorded.

[*] denotes introduced species.

Key: EPBC = Environmental Protection and Biodiversity Conservation Act 1999, BC = Biodiversity Conservation Act 2016 (IUCN Threat categories), DBCA = Department of Biodiversity, Conservation and Attractions Priority Code, A = Listed in Naturemap, B = EPBC Protected Matters search, C = Current Field Survey

Note: For Definitions of Conservation Codes see Appendix A.

BIRDS		Conservation Codes					
Scientific Name	Common Name	EPBC	BC	DBCA	A	B	C
CASUARIIDAE							
<i>Dromaius novaehollandiae</i>	Emu				X		
ANATIDAE							
<i>Cygnus atratus</i>	Black Swan				X		
<i>Tadorna tadornoides</i>	Australian Shelduck				x		
<i>Anas gracilis</i>	Grey Teal				X		
COLUMBIDAE							
<i>Columba livia</i>	Rock Pigeon				X		
<i>Geopelia cuneata</i>	Diamond Dove				X		X
<i>Ocyphaps lophotes</i>	Crested Pigeon				X		
PHAETHONITDAE							
<i>Phaethon lepturus</i>	White-tailed Tropicbird				X		
PODICIPEDIDAE							
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe				X		
APODIDAE							
<i>Apus pacificus</i>	Fork-tailed Swift	MiMa	MI		X	X	
PROCELLARIIDAE							
<i>Macronectes giganteus</i>	Southern Giant-Petrel	En	MI			X	
<i>Pterodroma mollis</i>	Soft-plumaged Petrel	Vu				X	
<i>Ardenna carneipes</i>	Flesh-footed Shearwater	MiMa	T			X	
<i>Puffinus pacificus</i>	Wedge-tailed Shearwater	MiMa	MI		X		
DIOMEDEIDAE							
<i>Thalassarche impavida</i>	Campbell Albatross	Vu	MI			X	
FREGATIDAE							
<i>Fregata ariel</i>	Lesser Frigatebird	MiMa	MI			X	
SULIDAE							
<i>Morus serrator</i>	Australasian Gannet				X		
PHALACROCORACIDAE							
<i>Phalacrocorax carbo</i>	Great Cormorant				X		
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant				X		
<i>Phalacrocorax varius</i>	Pied Cormorant				X		
PELECANIDAE							
<i>Pelecanus conspicillatus</i>	Australian Pelican				X		
ARDEIDAE							

BIRDS	Scientific Name	Common Name	Conservation Codes					
			EPBC	BC	DBCA	A	B	C
	<i>Ardea modesta</i>	Great Egret	MiMa			X	X	
	<i>Ardea ibis</i>	Cattle Egret	MiMa				X	
	<i>Egretta sacra</i>	Eastern Reef Egret	MiMa			X		
	<i>Egretta novaehollandiae</i>	White-faced Heron				X		
THRESKIORNITHIDAE								
	<i>Threskiornis molucca</i>	Australian White Ibis						X
	<i>Threskiornis spinicollis</i>	Straw-necked Ibis				X		X
ACCIPITRIDAE								
	<i>Pandion cristatus</i>	Osprey	MiMa	MI		X	X	
	<i>Elanus axillaris</i>	Black-shouldered Kite				X		
	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	Ma			X	X	
	<i>Haliastur sphenurus</i>	Whistling Kite				X		
	<i>Aquila audax</i>	Wedge-tailed Eagle				X		
	<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk				X		
	<i>Circus assimilis</i>	Spotted Harrier				X		
	<i>Circus approximans</i>	Swamp Harrier				X		
FALCONIDAE								
	<i>Falco cenchroides</i>	Nankeen Kestrel				X		
	<i>Falco longipennis</i>	Australian Hobby				X		
	<i>Falco peregrinus</i>	Peregrine Falcon		OS		X		
RALLIDAE								
	<i>Gallirallus philippensis</i>	Buff-banded Rail				X		
OTDIDDAE								
	<i>Ardeotis australis</i>	Australian Bustard				X		
HAEMATOPODIDAE								
	<i>Haematopus fuliginosus</i>	Sooty Oystercatcher				X		
	<i>Haematopus longirostris</i>	Pied Oystercatcher				X		
RECURVIROSTRIDAE								
	<i>Himantopus himantopus</i>	Black-winged Stilt				X		
CHARADRIIDAE								
	<i>Charadrius leschenaultii</i>	Greater Sand Plover	Vu, MiMa	MI		X		
	<i>Charadrius mongolus</i>	Lesser Sand Plover	En, MiMa	MI		X		
	<i>Charadrius ruficapillus</i>	Red-capped Plover				X		
	<i>Charadrius veredus</i>	Oriental Plover	MiMa			X	X	
	<i>Erythrogonys cinctus</i>	Red-kneed Dotterel				X		
	<i>Pluvialis fulva</i>	Pacific Golden Plover	MiMa			X		
	<i>Pluvialis squatarola</i>	Grey Plover	MiMa			X		
	<i>Vanellus tricolor</i>	Banded Lapwing				X		
PHASIANIDAE								
	<i>Coturnix pectoralis</i>	Stubble Quail				X		
GLAREOLIDAE								

BIRDS		Conservation Codes					
Scientific Name	Common Name	EPBC	BC	DBCA	A	B	C
<i>Glareola maldivarum</i>	Oriental Pratincole	MiMa				X	
LARIDAE							
<i>Anous stolidus</i>	Common Noddy	MiMa			X	X	
<i>Chlidonias leucopterus</i>	White-winged Black Tern	MiMa	MI		X		
<i>Chroicocephalus novaehollandiae</i>	Silver Gull				X		X
<i>Hydroprogne caspia</i>	Caspian Tern	MiMa	MI		X		
<i>Larus pacificus</i>	Pacific Gull	Ma			X		
<i>Onychoprion anaethetus</i>	Bridled Tern	MiMa	MI		X		
<i>Sterna dougallii</i>	Roseate Tern	MiMa	MI		X		
<i>Sterna hirundo</i>	Common Tern	MiMa	MI		X		
<i>Sternula albifrons</i>	Little Tern	MiMa	MI		X		
<i>Thalasseus bengalensis</i>	Lesser Crested Tern	Ma			X		
<i>Thalasseus bergii</i>	Crested Tern		MI		X		
<i>Sternula nereis</i>	Australian Fairy Tern	Vu	Vu		X	X	
SCOLOPACIDAE							
<i>Actitis hypoleucos</i>	Common Sandpiper	MiMa			X	X	
<i>Arenaria interpres</i>	Ruddy Turnstone	MiMa			X		
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	MiMa			X	X	
<i>Calidris canutus</i>	Red Knot	En	T			X	
<i>Calidris ferruginea</i>	Curlew Sandpiper	Cr, MiMa	T		X	X	
<i>Calidris melanotos</i>	Pectoral Sandpiper	Mi				X	
<i>Caliris ruficollis</i>	Red-necked Stint	MiMa			X		
<i>Calidris tenuirostris</i>	Great Knot	Cr, MiMa	MI		X		
<i>Limosa lapponica</i>	Bar-tailed Godwit	MiMa				X	
<i>Limosa lapponica baueri</i>	Bar-tailed Godwit (Western Alaskan)	Vu	T			X	
<i>Limosa lapponica menzbieri</i>	Bar-tailed Godwit (Northern Siberian)	Cr	T			X	
<i>Numenius madagascariensis</i>	Eastern Curlew	Cr	T			X	
<i>Tringa brevipes</i>	Grey-tailed tattler	MiMa		P4	X		
<i>Tringa glareola</i>	Wood Sandpiper	MiMa			X		
<i>Tringa nebularia</i>	Common Greenshank	MiMa			X	X	
<i>Xenus cinereus</i>	Terek Sandpiper	MiMa			X		
TURNICADAE							
<i>Turnix velox</i>	Little Button-quail				X		
PSITTACIDAE							
<i>Eolophus roseicapillus</i>	Galah				X		
<i>Cacatua sanguinea</i>	Little Corella				X		
<i>Melopsittacus undulatus</i>	Budgerigar				X		
<i>Nymphicus hollandicus</i>	Cockatiel				X		
<i>Pezoporus occidentalis</i>	Night Parrot	En	En			X	
CUCULIDAE							
<i>Chalcites osculans</i>	Black-eared Cuckoo					X	

BIRDS	Scientific Name	Common Name	Conservation Codes				
			EPBC	BC	DBCA	A	B
HALCYONIDAE							
	<i>Todiramphus sanctus</i>	Sacred Kingfisher				X	
MEROPIDAE							
	<i>Merops ornatus</i>	Rainbow Bee-eater	Ma			X	X
MALURIDAE							
	<i>Malurus lamberti</i>	Variiegated Fairy-wren				X	X
	<i>Malurus leucopterus</i>	White-winged Fairy-wren				X	
ACANTHIZIDAE							
	<i>Calamanthus campestris</i>	Rufous Fieldwren				X	
	<i>Pyrholaemus brunneus</i>	Redthroat				X	
MELIPHAGIDAE							
	<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater				X	
	<i>Certhionyx variegatus</i>	Pied Honeyeater				X	
	<i>Epthianura tricolor</i>	Crimson Chat				X	
	<i>Lichmera indistincta</i>	Brown Honeyeater					X
	<i>Manorina flavigula</i>	Yellow-throated Miner				X	X
PAOPHODIDAE							
	<i>Psophodes occidentalis</i>	Chiming Wedgebill				X	
CAMPEPHAGIDAE							
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike				X	
PACHYCEPHALIDAE							
	<i>Oreica gutturalis</i>	Crested Bellbird				X	
CRACTICIDAE							
	<i>Cracticus nigrogularis</i>	Pied Butcherbird				X	
	<i>Cracticus torquatus</i>	Grey Butcherbird				X	
RHIPIDURIDAE							
	<i>Rhipidura albiscapa</i>	Grey Fantail				X	
	<i>Rhipidura leucophrys</i>	Willie Wagtail				X	
MONARCHIDAE							
	<i>Grallina cyanoleuca</i>	Magpie-Lark				X	X
CORVIDAE							
	<i>Corvus bennetti</i>	Little Crow				X	
	<i>Corvus orru</i>	Torresian Crow				X	X
ALAUDIDAE							
	<i>Mirafra javanica</i>	Horsfield's Bushlark				X	
MEGALURIDAE							
	<i>Cincloramphus cruralis</i>	Brown Songlark					X
	<i>Eremiornis carteri</i>	Spinifexbird					X
TIMALIIDAE							
	<i>Zosterops luteus</i>	Yellow White-eye				X	
	<i>Zosterops lateralis</i>	Silvereye				X	

BIRDS		Conservation Codes					
Scientific Name	Common Name	EPBC	BC	DBCA	A	B	C
HIRUNDINIDAE							
<i>Cheramoeca leucosterna</i>	White-backed Swallow				X		
<i>Hirundo neoxena</i>	Welcome Swallow				X		X
<i>Hirundo rustica</i>	Barn Swallow	MiMa	MI		X	X	
<i>Petrochelidon nigricans</i>	Tree Martin				X		
ESTRILDIDAE							
<i>Neochmia ruficauda</i>	Star Finch				X		
<i>Taeniopygia guttata</i>	Zebra Finch				X		X

Key: EPBC = Environmental Protection and Biodiversity Conservation Act 1999, BC = Biodiversity Conservation Act 2016 (IUCN Threat categories), DBCA = Department of Biodiversity, Conservation and Attractions Priority Code, A = Listed in Naturemap, B = EPBC Protected Matters search, C = Current Field Survey

Note: For Definitions of Conservation Codes see Appendix A.

MAMMALS		Conservation Codes					
Scientific Name	Common Name	EPBC	BC	DBCA	A	B	C
DASYURIDAE							
<i>Dasykaluta rosamondae</i>	Little Red Kaluta				X		
MACROPODIDAE							
<i>Macropus robustus</i>	Euro				X		
<i>Macropus rufus</i>	Red Kangaroo						X
HIPPOSIDERIDAE							
<i>Rhinonictis aurantia</i>	Pilbara Leaf-nosed Bat	Vu	Vu			X	
MURIDAE							
* <i>Mus musculus</i>	House Mouse				X	X	
<i>Notomys alexis</i>	Spinifex Hopping-mouse				X		
DUGONIDAE							
<i>Dugong dugon</i>	Dugong	MaMi	OS			X	
CANIDAE							
<i>Canis lupus familiaris</i>	Domestic Dog					X	
* <i>Vulpes vulpes</i>	Red Fox					X	
FELIDAE							
* <i>Felis catus</i>	Feral Cat					X	
LEPORIDAE							
* <i>Oryctolagus cuniculus</i>	European Rabbit					X	
BOVIDAE							
<i>Capra hircus</i>	Goat					X	
BALAENIDAE							
<i>Eubalaena australis</i>	Southern Right Whale	Ma	OS			X	
BALAENOPTERIDAE							
<i>Balaenoptera acutorostrata</i>	Minke Whale	Ma				X	
<i>Balaenoptera borealis</i>	Sei Whale	Vu	T			X	
<i>Balaenoptera edeni</i>	Bryde's Whale	MiMa				X	
<i>Balaenoptera musculus</i>	Blue Whale	VU	T			X	
<i>Megaptera novaeangliae</i>	Humpback Whale	Vu	OS		X	X	
<i>Balaenoptera physalus</i>	Fin Whale	Vu	T			X	
ZIPHIIDAE							
<i>Mesoplodon densirostris</i>	Blainville's Beaked Whale				X		
<i>Mesoplodon mirus</i>	True's Beaked Whale				X		
DELPHINIDAE							

MAMMALS		Conservation Codes					C
Scientific Name	Common Name	EPBC	BC	DBCA	A	B	
<i>Delphinus delphis</i>	Common Dolphin	Ma				X	
<i>Grampus griseus</i>	Risso's Dolphin	Ma				X	
<i>Orcinus orca</i>	Orca	MiMa				X	
<i>Sousa chinensis</i>	Indo-Pacific Humpback Dolphin	MiMa		P4	X	X	
<i>Stenella attenuata</i>	Spotted Dolphin	Ma				X	
<i>Tursiops aduncus</i>	Indo-Pacific Bottlenose Dolphin	MiMa				X	

[X] fauna species recorded.

[*] denotes introduced species.



Appendix 4: Habitat Assessments

FAUNA HABITAT ASSESSMENT SHEET

North-west

Location: Coral Bay

Site Number: HA1

Project Number: CE - CB

Date: 2/04/19

Easting: 783759

Aspect

N

NE

SW

NW

Quadrat Size: 50 x 50

Northing: 7437391

E

SE

W

N/A



Soil Texture	sand	sandy-loam	loam	cracking clay	clay
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VEGETATION

Vegetation Description	Hummock Grassland	Other:	Average Height	Cover				
	Acacia Shrubland	Stratum		Scattered Plants	Sparse	Moderate	Thick	
Riverine Woodland		Overstorey		0 <5%	1 <20%	2 20-60%	3 60-100%	
Other Grassland		Midstorey	1	0 <5%	1 <20%	2 20-60%	3 60-100%	
Euc Woodland		Ground Cover	0.4	0 <5%	1 <20%	2 20-60%	3 60-100%	
		<i>Acacia coriacea</i>						
		<i>Cenchrus ciliaris</i>						

CONDITION

Scale:	CONDITION						LAST FIRE				
	5 Pristine	4 Excellent	3 Very Good	2 Good	1 Degraded	0 Completely Degraded	0 <1 year	1 1-3 Yr	2 Yr	4-5 Yr	3 >5 Yr

DISTURBANCE

Buffel	(general)					(cattle)				
	0 heavy	1 medium*	2 mild	3 none		0 heavy	1 medium	2 mild	3 none	

GROUND COVER

Bare Ground	0 <5%	1 <20%	2 20-60%	3 60-100%	Hummock Grass	0 <5%	1 <20%	2 20-60%	3 60-100%
Rock	0 <5%	1 <20%	2 20-60%	3 60-100%	Other Grass	0 <5%	1 <20%	2 20-60%	3 60-100% *
Leaf Litter	0 <5%	1 <20%	2 20-60%	3 60-100%	Herbs	0 <5%	1 <20%	2 20-60%	3 60-100%
Logs >10cm	0 <5%	1 <20%	2 20-60%	3 60-100%	Other	0 <5%	1 <20%	2 20-60%	3 60-100%

MICROHABITATS

Burrowing Suitability	0 Rock	1 Stony	2 Sandy Loam	3 Sand	Peeling Bark	0 none	1 rare	2 moderate	3 common
Pebbles Stones	0 none	1 0-30%	2 30-70%	3 70-100%	Large Hollows	0 none	1 rare	2 moderate	3 common
Exfoliating Slabs	0 none	1 0-30%	2 30-70%	3 70-100%	Small Hollows	0 none	1 rare	2 moderate	3 common
Rock Crevices	0 none	1 0-30%	2 30-70%	3 70-100%	Water Presence	0 none	1 rare	2 moderate	3 common
Boulders	0 none	1 0-30%	2 30-70%	3 70-100%	Distance to Water	0 >5km	1 2-5km	2 500m - 2km	3 <500m

Suitability for Bats	YES		NO	Termite Mounds	0 none	1 rare	2 moderate	3 common
Caves	Absent	Present		Woody Debris	0 none	1 rare	2 moderate	3 common
SPECIES								
Mulgara	YES	NO	DETAILS					
Bilby	YES	NO						
Quoll	YES	NO						
Pebble Mouse	YES	NO						
Birds			Mammals			Reptiles		
Torresian Crow			Kangaroo scats (Red Kangaroo)			Agamid burrows		
Brown Songlark						Varanid burrows - <i>Varanus gouldii</i>		

FAUNA HABITAT ASSESSMENT SHEET

North-west

Location: Coral Bay

Site Number: HA2

Project Number: CE - CB

Date: 2/04/19

Easting: 783815

Aspect

N

NE

SW

NW

Quadrat Size: 50 x 50

Northing: 7437311

E

SE

W

N/A



Soil Texture

sand

sandy-loam

loam

cracking clay

clay

VEGETATION

Vegetation Description	Hummock Grassland	Other:		Average Height	Cover			
	Acacia Shrubland	Stratum			Scattered Plants	Sparse	Moderate	Thick
Riverine Woodland		Overstorey			0 <5%	1 <20%	2 20-60%	3 60-100%
Other Grassland		Midstorey	<i>Acacia coriacea</i>	1	0 <5%	1 <20%	2 20-60%	3 60-100%
Euc Woodland		Ground Cover	<i>Cenchrus ciliaris</i>	0.4	0 <5%	1 <20%	2 20-60%	3 60-100%

CONDITION

LAST FIRE

Scale:	5 Pristine	4 Excellent	3 Very Good	2 Good	1 Degraded	0 Completely Degraded	0 <1 year	1 1-3 Yr	2 Yr	4-5	3 >5 Yr
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(general)

DISTURBANCE

(cattle)

Buffel	0 heavy	1 medium*	2 mild	3 none	0 heavy	1 medium	2 mild	3 none
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GROUND COVER

	0 <5%	1 <20%	2 20-60%	3 60-100%	Hummock Grass	0 <5%	1 <20%	2 20-60%	3 60-100%
Bare Ground	0 <5%	1 <20%	2 20-60%	3 60-100%	Hummock Grass	0 <5%	1 <20%	2 20-60%	3 60-100%
Rock	0 <5%	1 <20%	2 20-60%	3 60-100%	Other Grass	0 <5%	1 <20%	2 20-60%	3 60-100% *
Leaf Litter	0 <5%	1 <20%	2 20-60%	3 60-100%	Herbs	0 <5%	1 <20%	2 20-60%	3 60-100%
Logs >10cm	0 <5%	1 <20%	2 20-60%	3 60-100%	Other	0 <5%	1 <20%	2 20-60%	3 60-100%

MICROHABITATS

Burrowing Suitability	0 Rock	1 Stony	2 Sandy Loam	3 Sand	Peeling Bark	0 none	1 rare	2 moderate	3 common
Pebbles Stones	0 none	1 0-30%	2 30-70%	3 70-100%	Large Hollows	0 none	1 rare	2 moderate	3 common
Exfoliating Slabs	0 none	1 0-30%	2 30-70%	3 70-100%	Small Hollows	0 none	1 rare	2 moderate	3 common
Rock Crevices	0 none	1 0-30%	2 30-70%	3 70-100%	Water Presence	0 none	1 rare	2 moderate	3 common
Boulders	0 none	1 0-30%	2 30-70%	3 70-100%	Distance to Water	0 >5km	1 2-5km	2 500m - 2km	3 <500m

Suitability for Bats	YES		NO	Termite Mounds	0 none	1 rare	2 moderate	3 common
Caves	Absent	Present		Woody Debris	0 none	1 rare	2 moderate	3 common
SPECIES								
Mulgara	YES	NO	DETAILS					
Bilby	YES	NO						
Quoll	YES	NO						
Pebble Mouse	YES	NO						
Birds			Mammals				Reptiles	

FAUNA HABITAT ASSESSMENT SHEET

North-west

Location: Coral Bay

Site Number: HA3

Project Number: CE - CB

Date: 2/04/19

Easting: 784176

Aspect

N

NE

SW

NW

Quadrat Size: 50 x 50

Northing: 7438622

E

SE

W

N/A



Soil Texture

sand

sandy-loam

loam

cracking clay

clay

VEGETATION

Vegetation Description	Hummock Grassland	Other:		Average Height	Cover			
	Acacia Shrubland	Stratum			Scattered Plants	Sparse	Moderate	Thick
	Riverine Woodland	Overstorey				0 <5%	1 <20%	2 20-60%
Other Grassland	Midstorey	Acacia coriacea		1	0 <5%	1 <20%	2 20-60%	3 60-100%
Euc Woodland	Ground Cover	Cenchrus ciliaris		0.4	0 <5%	1 <20%	2 20-60%	3 60-100%

CONDITION

LAST FIRE

Scale:	5 Pristine	4 Excellent	3 Very Good	2 Good	1 Degraded	0 Completely Degraded	0 <1 year	1 1-3 Yr	2 Yr	4-5 Yr	3 >5 Yr
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(general)

DISTURBANCE

(cattle)

Rabbit, tracks	0 heavy	1 medium*	2 mild	3 none		0 heavy	1 medium	2 mild	3 none
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GROUND COVER

	0 <5%	1 <20%	2 20-60%	3 60-100%	Hummock Grass	0 <5%	1 <20%	2 20-60%	3 60-100%
Bare Ground	0 <5%	1 <20%	2 20-60%	3 60-100%	Hummock Grass	0 <5%	1 <20%	2 20-60%	3 60-100%
Rock	0 <5%	1 <20%	2 20-60%	3 60-100%	Other Grass	0 <5%	1 <20%	2 20-60%	3 60-100% *
Leaf Litter	0 <5%	1 <20%	2 20-60%	3 60-100%	Herbs	0 <5%	1 <20%	2 20-60%	3 60-100%
Logs >10cm	0 <5%	1 <20%	2 20-60%	3 60-100%	Other	0 <5%	1 <20%	2 20-60%	3 60-100%

MICROHABITATS

Burrowing Suitability	0 Rock	1 Stony	2 Sandy Loam	3 Sand	Peeling Bark	0 none	1 rare	2 moderate	3 common
Pebbles Stones	0 none	1 0-30%	2 30-70%	3 70-100%	Large Hollows	0 none	1 rare	2 moderate	3 common
Exfoliating Slabs	0 none	1 0-30%	2 30-70%	3 70-100%	Small Hollows	0 none	1 rare	2 moderate	3 common
Rock Crevices	0 none	1 0-30%	2 30-70%	3 70-100%	Water Presence	0 none	1 rare	2 moderate	3 common
Boulders	0 none	1 0-30%	2 30-70%	3 70-100%	Distance to Water	0 >5km	1 2-5km	2 500m - 2km	3 <500m

Suitability for Bats	YES		NO	Termite Mounds	0 none	1 rare	2 moderate	3 common
Caves	Absent	Present		Woody Debris	0 none	1 rare	2 moderate	3 common
SPECIES								
Mulgara	YES	NO	DETAILS					
Bilby	YES	NO						
Quoll	YES	NO						
Pebble Mouse	YES	NO						
Birds			Mammals			Reptiles		
Rainbow Bee-eater			Kangaroo scats (Red Kangaroo)			Agamid burrows		
Zebra Finch								
Spinifex Bird								

FAUNA HABITAT ASSESSMENT SHEET

North-west

Location: Coral Bay

Site Number: HA4

Project Number: CE - CB

Date: 2/04/19

Easting: 784253

Aspect

N

NE

SW

NW

Quadrat Size: 50 x 50

Northing: 7438580

E

SE

W

N/A



Soil Texture	sand	sandy-loam	loam	cracking clay	clay						
VEGETATION											
Vegetation Description	Hummock Grassland	Other:		Average Height	Cover						
	Acacia Shrubland	Stratum			Scattered Plants	Sparse	Moderate	Thick			
	Riverine Woodland	Overstorey		0 <5%	1 <20%	2 20-60%	3 60-100%				
	Other Grassland	Midstorey	<i>Acacia coriacea</i>	1 <5%	1 <20%	2 20-60%	3 60-100%				
	Euc Woodland	Ground Cover	<i>Cenchrus ciliaris</i>	0.4 <5%	1 <20%	2 20-60%	3 60-100%				
CONDITION						LAST FIRE					
Scale:	5 Pristine	4 Excellent	3 Very Good	2 Good	1 Degraded	0 Completely Degraded	0 <1 year	1 1-3 Yr	2 Yr	4-5	3 >5 Yr
(general) DISTURBANCE						(cattle)					
Rabbit, tracks	0 heavy	1 medium*	2 mild	3 none		0 heavy	1 medium	2 mild	3 none		
GROUND COVER											
Bare Ground	0 <5%	1 <20%	2 20-60%	3 60-100%	Hummock Grass	0 <5%	1 <20%	2 20-60%	3 60-100%		
Rock	0 <5%	1 <20%	2 20-60%	3 60-100%	Other Grass	0 <5%	1 <20%	2 20-60%	3 60-100% *		
Leaf Litter	0 <5%	1 <20%	2 20-60%	3 60-100%	Herbs	0 <5%	1 <20%	2 20-60%	3 60-100%		
Logs >10cm	0 <5%	1 <20%	2 20-60%	3 60-100%	Other	0 <5%	1 <20%	2 20-60%	3 60-100%		
MICROHABITATS											
Burrowing Suitability	0 Rock	1 Stony	2 Sandy Loam	3 Sand	Peeling Bark	0 none	1 rare	2 moderate	3 common		
Pebbles Stones	0 none	1 0-30%	2 30-70%	3 70-100%	Large Hollows	0 none	1 rare	2 moderate	3 common		
Exfoliating Slabs	0 none	1 0-30%	2 30-70%	3 70-100%	Small Hollows	0 none	1 rare	2 moderate	3 common		
Rock Crevices	0 none	1 0-30%	2 30-70%	3 70-100%	Water Presence	0 none	1 rare	2 moderate	3 common		
Boulders	0 none	1 0-30%	2 30-70%	3 70-100%	Distance to Water	0 >5km	1 2-5km	2 500m - 2km	3 <500m		

Suitability for Bats	YES		NO	Termite Mounds	0 none	1 rare	2 moderate	3 common
Caves	Absent	Present		Woody Debris	0 none	1 rare	2 moderate	3 common
SPECIES								
Mulgara	YES	NO	DETAILS					
Bilby	YES	NO						
Quoll	YES	NO						
Pebble Mouse	YES	NO						
Birds			Mammals			Reptiles		
			Kangaroo scats (Red Kangaroo)					

FAUNA HABITAT ASSESSMENT SHEET

North-west

Location: Coral Bay

Site Number: HA6

Project Number: CE - CB

Date: 2/04/19

Easting: 783440

Aspect

N

NE

SW

NW

Quadrat Size: 50 x 50

Northing: 7437829

E

SE

W

N/A



Soil Texture	sand	sandy-loam	loam	cracking clay	clay
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VEGETATION

Vegetation Description	Hummock Grassland	Other:	Average Height	Cover				
	Acacia Shrubland	Stratum		Scattered Plants	Sparse	Moderate	Thick	
Riverine Woodland	Overstorey			0 <5%	1 <20%	2 20-60%	3 60-100%	
Other Grassland	Midstorey	<i>Acacia coriacea</i>	1	0 <5%	1 <20%	2 20-60%	3 60-100%	
Euc Woodland	Ground Cover	<i>Cenchrus ciliaris</i> , <i>Spinifex longifolius</i> , <i>Carpobrotus sp.</i>	0.4	0 <5%	1 <20%	2 20-60%	3 60-100%	

CONDITION							LAST FIRE				
Scale:	5 Pristine	4 Excellent	3 Very Good	2 Good	1 Degraded	0 Completely Degraded	0 <1 year	1 1-3 Yr	2 Yr	4-5 Yr	3 >5 Yr

(general) DISTURBANCE					(cattle)					
PigFace	0 heavy	1 medium*	2 mild	3 none	0 heavy	1 medium	2 mild	3 none		

GROUND COVER

Category	0 <5%	1 <20%	2 20-60%	3 60-100%	Hummock Grass	0 <5%	1 <20%	2 20-60%	3 60-100%
Bare Ground	0 <5%	1 <20%	2 20-60%	3 60-100%	Hummock Grass	0 <5%	1 <20%	2 20-60%	3 60-100%
Rock	0 <5%	1 <20%	2 20-60%	3 60-100%	Other Grass	0 <5%	1 <20%	2 20-60%	3 60-100% *
Leaf Litter	0 <5%	1 <20%	2 20-60%	3 60-100%	Herbs	0 <5%	1 <20%	2 20-60%	3 60-100%
Logs >10cm	0 <5%	1 <20%	2 20-60%	3 60-100%	Other	0 <5%	1 <20%	2 20-60%	3 60-100%

MICROHABITATS

Burrowing Suitability	0 Rock	1 Stony	2 Sandy Loam	3 Sand	Peeling Bark	0 none	1 rare	2 moderate	3 common
Pebbles Stones	0 none	1 0-30%	2 30-70%	3 70-100%	Large Hollows	0 none	1 rare	2 moderate	3 common
Exfoliating Slabs	0 none	1 0-30%	2 30-70%	3 70-100%	Small Hollows	0 none	1 rare	2 moderate	3 common
Rock Crevices	0 none	1 0-30%	2 30-70%	3 70-100%	Water Presence	0 none	1 rare	2 moderate	3 common
Boulders	0 none	1 0-30%	2 30-70%	3 70-100%	Distance to Water	0 >5km	1 2-5km	2 500m - 2km	3 <500m

Suitability for Bats	YES		NO	Termite Mounds	0 none	1 rare	2 moderate	3 common
Caves	Absent	Present		Woody Debris	0 none	1 rare	2 moderate	3 common
SPECIES								
Mulgara	YES	NO	DETAILS					
Bilby	YES	NO						
Quoll	YES	NO						
Pebble Mouse	YES	NO						
Birds			Mammals			Reptiles		
Zebra Finch			Kangaroo scats (Red Kangaroo)					
Brown Honeyeater			Red Kangaroo					

FAUNA HABITAT ASSESSMENT SHEET

North-west

Location: Coral Bay

Site Number: HA6

Project Number: CE - CB

Date: 2/04/19

Easting: 783442

Aspect

NE

SW

NW

Quadrat Size: 50 x 50

Northing: 7437704

E

SE

W

N/A



Soil Texture

sand

sandy-loam

loam

cracking clay

clay

VEGETATION

Vegetation Description	Hummock Grassland	Other:	Average Height	Cover				
	Acacia Shrubland	Stratum		Scattered Plants	Sparse	Moderate	Thick	
Riverine Woodland	Overstorey		1	0 <5%	1 <20%	2 20-60%	3 60-100%	
Other Grassland	Midstorey	<i>Acacia coriacea</i>	1	0 <5%	1 <20%	2 20-60%	3 60-100%	
Euc Woodland	Ground Cover	<i>Cenchrus ciliaris, Spinifex longifolius, Carpobrotus sp.</i>	0.4	0 <5%	1 <20%	2 20-60%	3 60-100%	

CONDITION

LAST FIRE

Scale:	5 Pristine	4 Excellent	3 Very Good	2 Good	1 Degraded	0 Completely Degraded	0 <1 year	1 1-3 Yr	2 4-5 Yr	3 >5 Yr
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(general)

DISTURBANCE

(cattle)

Tracks,rubbish	0 heavy	1 medium*	2 mild	3 none		0 heavy	1 medium	2 mild	3 none
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GROUND COVER

	0 <5%	1 <20%	2 20-60%	3 60-100%		0 <5%	1 <20%	2 20-60%	3 60-100%
Bare Ground	0 <5%	1 <20%	2 20-60%	3 60-100%	Hummock Grass	0 <5%	1 <20%	2 20-60%	3 60-100%
Rock	0 <5%	1 <20%	2 20-60%	3 60-100%	Other Grass	0 <5%	1 <20%	2 20-60%	3 60-100% *
Leaf Litter	0 <5%	1 <20%	2 20-60%	3 60-100%	Herbs	0 <5%	1 <20%	2 20-60%	3 60-100%
Logs >10cm	0 <5%	1 <20%	2 20-60%	3 60-100%	Other (succulents)	0 <5%	1 <20%	2 20-60%	3 60-100%

MICROHABITATS

Burrowing Suitability	0 Rock	1 Stony	2 Sandy Loam	3 Sand	Peeling Bark	0 none	1 rare	2 moderate	3 common
Pebbles Stones	0 none	1 0-30%	2 30-70%	3 70-100%	Large Hollows	0 none	1 rare	2 moderate	3 common
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Caves	Absent	Present		Woody Debris	0 none	1 rare	2 moderate	3 common
SPECIES								
Mulgara	YES	NO	DETAILS					
Bilby	YES	NO						
Quoll	YES	NO						
Pebble Mouse	YES	NO						
Birds			Mammals			Reptiles		
Zebra Finch			Kangaroo scats (Red Kangaroo)					
			Red Kangaroo					