

# Fauna Assessment



## Ocean Drive Upgrade Project

City of Bunbury

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V2

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# TABLE OF CONTENTS

## SUMMARY

1.	INTRODUCTION .....	1
2.	SCOPE OF WORKS.....	1
3.	METHODS .....	2
3.1	POTENTIAL FAUNA INVENTORY - LITERATURE REVIEW .....	2
3.1.1	Database Searches .....	2
3.1.2	Previous Fauna Surveys in the Area .....	2
3.1.3	Existing Publications .....	4
3.1.4	Fauna of Conservation Significance .....	5
3.1.5	Likelihood of Occurrence – Vertebrate Fauna of Conservation Significance .....	6
3.1.6	Taxonomy and Nomenclature.....	7
3.2	SITE SURVEYS.....	8
3.2.1	Fauna Habitat Assessment.....	8
3.2.2	Opportunistic Fauna Observations .....	8
3.2.3	Western Ringtail Possum Assessment.....	8
3.2.4	Black Cockatoo Habitat Assessment.....	8
3.2.4.1	Black Cockatoo Breeding Habitat.....	9
3.2.4.2	Black Cockatoo Foraging Habitat.....	10
3.2.4.3	Black Cockatoo Roosting Habitat.....	10
4.	SURVEY CONSTRAINTS .....	10
5.	RESULTS .....	11
5.1	POTENTIAL FAUNA INVENTORY – LITERATURE REVIEW .....	11
5.2	SITE SURVEYS.....	12
5.2.1	Fauna Habitat Assessment.....	12

5.2.2	Opportunistic Fauna Observations .....	14
5.2.3	Western Ringtail Possum Assessment .....	14
5.2.4	Black Cockatoo Habitat Assessment .....	14
5.2.4.1	Black Cockatoo Breeding Habitat.....	14
5.2.4.2	Black Cockatoo Foraging Habitat.....	15
5.2.4.3	Black Cockatoo Roosting Habitat.....	15
5.3	FAUNA INVENTORY – SUMMARY .....	15
5.3.1	Vertebrate Fauna .....	15
5.3.2	Vertebrate Fauna of Conservation Significance .....	16
6.	POTENTIAL IMPACTS OF DEVELOPMENT.....	18
7.	ENVIRONMENT PROTECTION & BIODIVERSITY ACT 1999 .....	20
7.1	WESTERN RINGTAIL POSSUMS .....	21
7.2	BLACK COCKATOOS .....	22
8.	CONCLUSION.....	24
9.	REFERENCES .....	25

**TABLES**

TABLE 1:	Example Images of Fauna Habitats within the Study Area
TABLE 2:	Summary of Potential Black Cockatoo Habitat Trees within the Study area
TABLE 3:	Summary of Potential Vertebrate Fauna Species (as listed in Appendix B)
TABLE 4:	Likelihood of Occurrence and Possible Impacts – Fauna Species of Conservation Significance

## **FIGURES**

FIGURE 1: Study Area - Air Photo

FIGURE 2: Habitat Trees (DBH  $\geq$ 50cm)

## **APPENDICES**

APPENDIX A: Conservation Categories

APPENDIX B: List of Observed and Potential Fauna

APPENDIX C: DPaW & EPBC Database Search Results

APPENDIX D: Black Cockatoo Habitat Tree Details

**Acronyms/Abbreviations:**

**ALA:** Atlas of Living Australia [www.ala.org.au](http://www.ala.org.au)

**BA:** Birdlife Australia (Formerly RAOU, Birds Australia).

**BC Bill:** Biodiversity Conservation Bill (2015). WA Government.

**°C:** Degrees Celsius.

**CALM:** Department of Conservation and Land Management (now DPaW), WA Government.

**CAMBA:** China Australia Migratory Bird Agreement 1998.

**CBD:** Central Business District.

**DBH:** Diametre at Breast Height – tree measurement.

**DEC:** Department of Environment and Conservation (now DPaW), WA Government.

**DEH:** Department of Environment and Heritage (now DotEE), Australian Government.

**DEP:** Department of Environment Protection (now DER), WA Government.

**DER:** Department of Environment Regulation (formerly DEC, DoE), WA Government.

**DEWHA:** Department of the Environment, Water, Heritage and the Arts (now DotEE), Australian Government

**DMP:** Department of Mines and Petroleum (formerly DoIR), WA Government.

**DoE:** Department of Environment (now DER/DPaW), WA Government.

**DotE:** Department of the Environment (now DotEE), Australian Government.

**DotEE:** Department of the Environment and Energy (formerly SEWPaC, DWEHA, DEH & DoE), Australian Government.

**DoIR:** Department of Industry and Resources (now DMP), WA Government.

**DPaW:** Department of Parks and Wildlife (formerly DEC, CALM, DoE), WA Government.

**EP Act:** *Environmental Protection Act 1986*, WA Government.

**EPA:** Environmental Protection Authority, WA Government.

**EPBC Act:** *Environment Protection and Biodiversity Conservation Act 1999*, Australian Government.

**ha:** Hectare (10,000 square metres).

**IBRA:** Interim Biogeographic Regionalisation for Australia.

**IUCN:** International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union.

**JAMBA:** Japan Australia Migratory Bird Agreement 1981.

**km:** Kilometre.

**MNES:** Matters of National Environmental Significance.

**m:** Metre.

**mm:** Millimetre.

**RAOU:** Royal Australia Ornithologist Union.

**ROKAMBA:** Republic of Korea-Australia Migratory Bird Agreement 2007.

**SEWPaC:** Department of Sustainability, Environment, Water, Population and Communities (now DotEE), Australian Government

**SSC:** Species Survival Commission, International.

**WA:** Western Australia.

**WAM:** Western Australian Museum, WA Government.

**WC Act:** *Wildlife Conservation Act 1950*, WA Government.

**WRP:** Western Ringtail Possum

## SUMMARY

This report details the results of a fauna assessment of a section Ocean Drive, located in the City of Bunbury (the City). The City proposes to widen a ~2.5km section of the road between Hastie Street in the north and Washington Avenue in the south (the study area) to allow for the inclusion of two bike lanes (the Project) (Figure 1). To undertake these works the clearing of a small number of trees and shrubs in a few select locations will be required.

The scope of works was to conduct a Level 1 fauna survey as defined by the EPA (EPA 2004). Because some listed threatened species (e.g. several species of black cockatoo and the western ringtail possum) are known to occur in the general area, the scope of the survey work was expanded to include targeted assessment of the site's significance to these particular species as well. The assessment has included a literature review ("desktop study"), one daytime and one night time field survey.

The study area is located over an existing two lane road and the adjoining road reserve which is almost totally cleared of native remnant vegetation. Most of the native vegetation is associated with the Maidens Reserve which borders the study area along a part of its western boundary. In the north, this vegetation is primarily a low coastal shrubland that grades into a tuart (*Eucalyptus gomphocephala*) woodland over peppermint (*Agonis flexuosa*) low open woodland southwards, though the actual number of trees within the study area is small.

The balance of the study area is represented by areas of no vegetation (bare sand/grass/weeds) or by relatively sparse planted endemic and non-endemic species including non-endemic eucalypts (species unknown), a number of *Acacia* spp., sheoak (*Allocasuarina* sp.), peppermint, paperbark (*Melaleuca* sp.) and shrubs.

Overall fauna habitat values at the study area have been severely compromised by the removal of most of the original native vegetation. The study area lacks most natural attributes and is now only likely to be utilised by generally common and widespread fauna species with non-specific requirements which allow them to persist in disturbed/highly disturbed habitats. The fact that the Maidens Reserve borders the study area increases the likelihood of some species being present given that large areas of much better habitat is present in this area.

No evidence of WRPs using the study area was found (i.e. no dreys, scats or individuals). The lack of observations of WRPs within the study area can be attributed to the poor quality of habitat present.

The survey results suggest that study area is not an area of significance for western ringtail possums.

The black cockatoo habitat tree assessment identified one single tuart tree within the study area with a DBH of  $\geq 50$ cm. This tree was not observed to contain hollows of any size. No evidence of black cockatoos foraging with the study area was observed during the survey period. This can be attributed to the total absence of any quality foraging habitat. No existing

roosting trees (trees used at night by black cockatoos to rest) were positively identified during the survey.

The survey results suggest that study area is not an area of significance for any of the three species of black cockatoo known to frequent the general area.

An assessment of the overall impacts on fauna which may result because of development within the study area suggest they will be nonexistence or negligible. Impacts, if they were to occur, are only expected to be low and relate to the loss of very small areas of highly degraded habitat of very limited extent.

Based on the results of this assessment it is the Authors opinion that no significant impact on threatened fauna species listed under the *EPBC Act* will occur because of clearing of vegetation from within the Ocean Drive project area. This conclusion is primarily based on the very limited amount of habitat that will be affected and/or its very poor quality.

This would indicate that, if the City were to refer the proposed development to the DotEE for review, clearing of the vegetation in question would be assessed as “not a controlled action” and therefore would not require further assessment or approval under the *EPBC Act* before it could proceed. As such submission of a referral in the first instance would seem unwarranted.



## 1. INTRODUCTION

This report details the results of a fauna assessment of a section Ocean Drive, located in the City of Bunbury (the City). The City proposes to widen a ~2.5km section of the road between Hastie Street in the north and Washington Avenue in the south (the study area) to allow for the inclusion of two bike lanes (the Project) (Figure 1). To undertake these works the clearing of a small number of trees and shrubs in a few select locations will be required.

It is understood that a DER clearing permit will or has been applied for to allow for the clearing of the native vegetation associated with this project. The fauna assessment reported on here has primarily been carried out to assess the potential impact the project may have on fauna and fauna habitats so as to determine if any other approvals at a federal level maybe required (i.e. referral to ensure compliance with the *EPBC Act*).

Note: For the purposes of this report the term black cockatoo is in reference to Baudin's black cockatoo *Calyptorhynchus baudinii*, Carnaby's black cockatoo *Calyptorhynchus latirostris* and the forest red-tailed black cockatoo *Calyptorhynchus banksii naso*.

## 2. SCOPE OF WORKS

The Scope of Works for the fauna assessment has included:

1. Completion of a Level 1 fauna survey for the study area consistent with the EPA's Guidance Statement 56 (EPA 2004) and all other relevant state and federal government standards.
2. Completion of a targeted assessment for fauna species that are likely to utilise the site and are protected under the *EPBC Act*. The species of main concern have been identified as the western ringtail possum and all three species of black cockatoos. The scope of works for the targeted surveys was therefore:
  - A day time survey to record any evidence of western ringtail possums and black cockatoos onsite (e.g. observed individuals, evidence of their presence onsite such as dreys, scats, chewed fruits, nest hollow bite marks etc.) and their habitat (e.g. breeding, roosting/denning, foraging habitat), consistent with available literature;
  - One nocturnal survey to determine the distribution and abundance of western ringtail possums within the study area, if any.
3. Liaison with the City of Bunbury Project Manager as required;

4. Liaison with state and federal government environmental agencies to the extent necessitated by the contract, if at all;
5. Preparation of a concise report documenting the project methodology and results along with professional advice on whether the project is likely to cause a significant impact on MNES under the *EPBC Act* and thus requires referral to the federal DotEE.

### **3. METHODS**

#### **3.1 POTENTIAL FAUNA INVENTORY - LITERATURE REVIEW**

##### **3.1.1 Database Searches**

Searches of the following databases were undertaken to aid in the compilation of a list of vertebrate fauna potentially occurring within the study area:

- DPaW's NatureMap Database Search (combined data from DPaW, WAM, BA, ALA and consultant's reports) (DPaW 2017b); and
- Protected matters search tool (DotEE 2017).

It should be noted that lists produced during the abovementioned database searches contain observations/inferred distributions from a broader area than the study area and therefore may include species that would only ever occur as vagrants due to a lack of suitable habitat or the presence of only marginal habitat within the study area itself. The databases also often include or are based on very old records and in some cases certain fauna species have become locally or regionally extinct.

Information from these sources should therefore be taken as indicative only and local knowledge and information needs to be taken into consideration when determining what actual species may be present within the specific area being investigated. Fauna considered unlikely to be present even if appearing in these database searches are not shown in the potential species list.

##### **3.1.2 Previous Fauna Surveys in the Area**

Fauna surveys, assessments and reviews have been undertaken in nearby areas in the past, though not all are publically available and could not be referenced. The most significant of those available have been used as the primary reference material for compiling the potential fauna assemblage for the general area.

Those reports referred to included, but were not limited to:

- ATA Environmental (1998). Vertebrate Fauna Dalyellup Beach Estate Shire of Capel, Unpublished report for Homeswest/Home Building Society and Satterley Real Estate.
- 360 Environmental Pty Ltd (2008). Southern Seawater Desalination Project 2007, Terrestrial Flora and Fauna Survey Report. Unpublished report for the Water Corporation.
- Bamford Consulting Ecologists (2008). Fauna Assessment of the Proposed South Binningup Development. Unpublished report for RPS Consulting/Mirvac.
- Bow, B. (1999). The biogeography of the ground vertebrate fauna of the southern Swan Coastal Plain, Bunbury, W.A. B.Sc (Hons) Thesis, Curtin University of Technology. (Reptiles Only).
- ENV Australia (2007). Lots 1, 3, P3, 4, 4, 5, 7, 8 and 11 Washington Ave and Bussell Highway Usher. Unpublished report for TPG.
- ENV Australia (2008). Edith Cowan University, South West Campus. Fauna Assessment (Level 2). Unpublished report for ECU.
- HGM (2002). Natural Values of 12 Sites of the Greater Bunbury Region Scheme. Tasks 1, 2 and 3. Unpublished report for WAPC (Muddy Lakes Level 2 fauna survey results).
- Harewood, G. (2008). Fauna Assessment Survey (Level 2) Lot 187 Stratham. Unpublished report for MBS Environmental.
- McNee, S (1987). Avifauna Surveys of Ludlow Tuart Forests, Minninup and the old Yoganup Mine Site Capel, Western Australia. Report for Westralian Sands Ltd. (Birds only).

As with the databases searches some reports refer to species that would not occur in the study area due to a lack of suitable habitat (extent and/or quality) and this fact was taken into consideration when compiling the potential fauna species list. It should also be noted that the NatureMap database is likely to include some records from previous fauna surveys in the area including some of those listed above.

### 3.1.3 Existing Publications

The following represent the main publications used to identify and refine the potential fauna species list for the study area:

- Anstis, M. (2013). Tadpoles and Frogs of Australia. New Holland Publishers, Sydney.
- Barrett, G., Silcocks, A., Barry, S., Cunningham, R. and Poulter, R. (2003). The New Atlas of Australian Birds. Royal Australasian Ornithologists Union, Victoria.
- Bush, B., Maryan, B., Browne-Cooper, R. & Robinson, D. (2007). Reptiles and Frogs in the Bush: Southwestern Australia. UWA Press, Nedlands.
- Bush, B., Maryan, B., Browne-Cooper, R. & Robinson, D. (2010). Field Guide to Reptiles and Frogs of the Perth Region. UWA Press, Nedlands.
- Churchill, S. (2008). Australian Bats. Second Edition, Allen & Unwin.
- Cogger, H.G. (2014). Reptiles and Amphibians of Australia. 7th Edition. CSIRO Publishing.
- Johnstone, R.E. and Storr, G.M. (1998). Handbook of Western Australian Birds: Volume 1 – Non-passerines (Emu to Dollarbird). Western Australian Museum, Perth Western Australia.
- Johnstone, R.E. and Storr, G.M. (2004). Handbook of Western Australian Birds: Volume 2 – Passerines (Blue-winged Pitta to Goldfinch). Western Australian Museum, Perth Western Australia.
- Menkhorst, P. and Knight, F. (2011). A Field Guide to the Mammals of Australia. Oxford University Press, Melbourne.
- Morgan, D.L., Beatty, S.J., Klunzinger, M.W, Allen, M.G. and Burnham, Q.E (2011). Field Guide to the Freshwater Fishes, Crayfishes and Mussels of South Western Australia. Published by SERCUL.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1983). Lizards of Western Australia II: Dragons and Monitors. WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1990). Lizards of Western Australia III: Geckos and Pygopods. WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1999). Lizards of Western Australia I: Skinks. Revised Edition, WA Museum, Perth.

- Storr, G.M., Smith, L.A. and Johnstone R.E. (2002). Snakes of Western Australia. Revised Edition, WA Museum, Perth.
- Tyler M.J. & Doughty P. (2009). Field Guide to Frogs of Western Australia, Fourth Edition, WA Museum, Perth.
- Van Dyck, S., Gynther, I. & Baker, A. Eds (2013). Field Companion to The Mammals of Australia. Queensland Museum.
- Wilson, S. and Swan, G. (2013). A Complete Guide to Reptiles of Australia. Reed, New Holland, Sydney.
- Woinarski, J., Burbidge, A. & Harrison, P. (2014). The Action Plan for Australian Mammals 2012. CSIRO Publishing.

### 3.1.4 Fauna of Conservation Significance

The conservation significance of fauna species has been assessed using data from the following sources:

- *EPBC Act 1999*. Administered by the Australian Government DotEE;
- *WC Act 1950*. Administered by the Western Australian DPaW (Govt. of WA 2017). It should be noted that the *WC Act 1950* is soon to be repealed and replaced by the *Biodiversity Conservation Bill (2015)* currently before Parliament.
- Red List produced by the Species Survival Commission (SSC) of the World Conservation Union (also known as the IUCN Red List - the acronym derived from its former name of the International Union for Conservation of Nature and Natural Resources). The Red List has no legislative power in Australia but is used as a framework for State and Commonwealth categories and criteria; and the
- DPaW Priority Fauna list. A non-statutory list maintained by the DPaW for management purposes (DPaW 2017a).

The *EPBC Act* also requires the compilation of a list of migratory species that are recognised under international treaties including the:

- Japan Australia Migratory Bird Agreement 1981 (JAMBA);
- China Australia Migratory Bird Agreement 1998 (CAMBA);
- Republic of Korea-Australia Migratory Bird Agreement 2007 (ROKAMBA); and
- Bonn Convention 1979 (The Convention on the Conservation of Migratory Species of Wild Animals).

(Note - Species listed under JAMBA are also protected under Schedule 5 of the *WC Act*.)

All migratory bird species listed in the annexes to these bilateral agreements are protected in Australia as matters of national environmental significance (NES) under the *EPBC Act*.

The conservation status of all vertebrate fauna species listed as occurring or possibly occurring in the vicinity of the study area has been assessed using the most recent lists published in accordance with the above-mentioned instruments and is indicated as such in the fauna listings of this report. A full listing of conservation codes is provided in Appendix A.

A number of other species not listed in official lists can also be considered of local or regional conservation significance. These include species that have a restricted range, those that occur in breeding colonies and those at the limit of their range.

While not classified as rare, threatened or vulnerable under any State or Commonwealth legislation, a number of birds have been listed as species of significance on the Swan Coastal portion of the Perth Metropolitan Region (Bush Forever - Government of Western Australia 1998 and 2000). The bird species are often referred to as “Bush Forever Decreaser Species”. The three categories used for birds within the Bush Forever documents are:

- Habitat specialists with reduced distribution on the Swan Coastal Plain (code Bh)
- Wide ranging Species with reduced populations on the Swan Coastal Plain. (code Bp)
- Extinct in the Perth region (code Be)

The presence of Bush Forever species should be taken into some consideration when determining the fauna values of an area. Bush Forever decreaser species are indicated as such within the species list held in Appendix B.

### **3.1.5 Likelihood of Occurrence – Vertebrate Fauna of Conservation Significance**

Fauna of conservation significance identified during the literature review as previously being recorded in the general area were assessed and ranked for their likelihood of occurrence within the study area itself. The rankings and criteria used were:

- **Would Not Occur:** There is no suitable habitat for the species in the study area and/or there is no documented record of the species in the general area since records have been kept and/or the species is generally accepted as being locally/regionally extinct (supported by a lack of recent records).
  - **Locally Extinct:** Populations no longer occur within a small part of the species natural range, in this case within 10 or 20km of the study area. Populations do however persist outside of this area.

- Regionally Extinct: Populations no longer occur in a large part of the species natural range, in this case within the southern forest regions. Populations do however persist outside of this area.
- Unlikely to Occur: The study area is outside of the currently documented distribution for the species in question, or no suitable habitat (type, quality and extent) was identified as being present during the field assessment. Individuals of some species may occur occasionally as vagrants/transients especially if suitable habitat is located nearby but the study area itself would not support a population or part population of the species.
- Possibly Occurs: The study area is within the known distribution of the species in question and habitat of at least marginal quality was identified as being present during the field assessment, supported in some cases by recent records being documented in literature from within or near the study area. In some cases, while a species may be classified as possibly being present at times, habitat may be marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.
- Known to Occur: The species in question was positively identified as being present (for sedentary species) or as using the study area as habitat for some other purpose (for non-sedentary/mobile species) during the field survey. This information may have been obtained by direct observation of individuals or by way of secondary evidence (e.g. foraging debris, tracks and scats). In some cases, while a species may be classified as known to occur, habitat may be marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.

### 3.1.6 Taxonomy and Nomenclature

Taxonomy and nomenclature for fauna species used in this report is generally taken from the DPaW's WA Fauna Census Database which is assumed to follow Aplin and Smith (2001) for amphibians and reptiles and Johnstone (2001) for birds. Jackson and Groves (2015) has been used for mammals.

Common names are taken from the Western Australia Museum (WAM) recognised primary common name listings when specified, though where common names are not provided they have been acquired from other publications. Sources include Cogger (2014), Wilson and Swan (2013), Van Dyck & Strahan (2013), Christidis and Boles (2008), Bush *et al.* (2010), Bush *et al.* (2007), Tyler *et al.* (2000), and Glauret (1961). Not all common names are generally accepted.



## **3.2 SITE SURVEYS**

Daytime field survey work at the site was carried out on the 2 June 2017. The nocturnal WRP survey was carried out on the 1 June 2017. All survey work was completed by Greg Harewood (Zoologist).

### **3.2.1 Fauna Habitat Assessment**

As part of the literature review, available information on the habitat requirements of the species of conservation significance listed as possibly occurring in the area was researched. During the field survey the habitats within the study area were assessed and specific elements identified, if present, to determine the likelihood of listed threatened species utilising the area and its likely significance to them on a local and regional scale.

### **3.2.2 Opportunistic Fauna Observations**

Opportunistic observations of fauna species were made during all field survey work which primarily involved a series of transects across the study area during the day while searching microhabitats such as logs, leaf litter, observations of bird species with binoculars and a nocturnal survey using a headtorch. Secondary evidence of a species presence such as tracks, scats, skeletal remains, foraging evidence or calls were also noted if observed/heard.

### **3.2.3 Western Ringtail Possum Assessment**

To determine if western ringtail possums were utilising the study area the following was carried out:

- A single daytime survey of the site along close spaced traverses searching for dreys, obvious tree hollows (and other potential daytime refuge habitat), scats and individual WRPs. The day time survey was carried out using a GPS equipped PDA for guidance and as a data recorder;
- One night time survey to locate and record the distribution and abundance of WRPs. The nocturnal count involved the systematic searching of potential WRP habitats within the study area along a series of close spaced traverses, on foot using a head torch. The nocturnal count was carried out using a GPS equipped PDA for guidance and as a data recorder; and
- An estimation of the amount and quality of WRP habitat present within the study area based on field observations and available air photography.

### **3.2.4 Black Cockatoo Habitat Assessment**

The following methods were employed to comply with the defined scope of works and are based on guidelines published by the federal DotEE (SEWPaC 2012) which states that surveys for Carnaby's, Baudin's and forest red-tailed black cockatoo habitat should:



- be done by a suitably qualified person with experience in vegetation or cockatoo surveys, depending on the type of survey being undertaken;
- maximise the chance of detecting the species' habitat and/or signs of use;
- determine the context of the site within the broader landscape—for example, the amount and quality of habitat nearby and in the local region (for example, within 10 km);
- account for uncertainty and error (false presence and absences); and
- include collation of existing data on known locations of breeding and feeding birds and night roost locations.

Habitat used by black cockatoos have been placed into three categories by the DotEE (SEWPaC 2012) these being:

- Breeding Habitat;
- Foraging Habitat; and
- Night Roosting Habitat.

To comply with the requested scope of works and in line with the published guidelines the following was carried out.

#### **3.2.4.1 Black Cockatoo Breeding Habitat**

The black cockatoo breeding habitat assessment involved the identification of all suitable breeding trees species (native, endemic species only) within the study area that had a DBH of equal to or over 50cm. The DBH of each tree was estimated using a pre-made 50 cm “caliper”.

Target tree species included marri and jarrah or any other *Corymbia/Eucalyptus* species of a suitable size that may have been present. Peppermints, *banksia*, sheoak and *melaleuca* tree species (for example) were not assessed as they typically do not develop hollows that are used by black cockatoos.

The location of each tree identified as being over the threshold DBH was recorded with a GPS and details on tree species, number and size of hollows (if any) noted. Trees observed to contain hollows (of any size/type) were marked with “H” using spray paint for easy future reference.

Based on this assessment trees present within the study area have been place into one of four categories:

- Tree < 50cm DBH or an unsuitable species (not recorded);

- Tree  $\geq 50$ cm DBH, no hollows seen;
- Tree  $\geq 50$ cm DBH, one or more hollows seen, none of which were considered suitable for black cockatoos to use for nesting; or
- Tree  $\geq 50$ cm DBH, one or more hollows seen, with at least one considered suitable for black cockatoos to use for nesting.

For the purposes of this assessment a tree containing a potential cockatoo nest hollow was defined as:

*Generally, any tree which is alive or dead that contains one or more visible hollows (cavities within the trunk or branches) suitable for occupation by a black cockatoo for the purpose of nesting/breeding. Hollows that had an entrance greater than about 10cm in diameter and would allow the entry of a black cockatoo into a suitably orientated and sized branch/trunk were recorded as a “potential black cockatoo nest hollow”.*

#### **3.2.4.2 Black Cockatoo Foraging Habitat**

The location and nature of black cockatoo foraging evidence (e.g. chewed fruits around base of trees) observed during the reconnaissance survey was recorded. The nature and extent of potential foraging habitat present was also documented irrespective of the presence of any actual foraging evidence.

#### **3.2.4.3 Black Cockatoo Roosting Habitat**

Direct and indirect evidence of black cockatoos roosting within trees was with the study area was noted if observed (e.g. branch clippings, droppings or moulted feathers).

## **4. SURVEY CONSTRAINTS**

No seasonal sampling has been carried out as part of this fauna assessment. The conclusions presented are based upon field data and the environmental monitoring and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the study area at the time of the field assessments. It should also be recognised that site conditions can change with time.

Some fauna species are reported as potentially occurring within the study area based on there being suitable habitat (quality and extent) within the study area or immediately adjacent. With respect to opportunistic observations, the possibility exists that certain species may not have been detected during field investigations due to:

- seasonal inactivity during the field survey;
- species present within micro habitats not surveyed;

- cryptic species able to avoid detection; and
- transient wide-ranging species not present during the survey period.

Lack of observational data on some species should therefore not necessarily be taken as an indication that a species is absent from the study area.

The habitat requirements and ecology of many of the species known to occur in the wider area are often not well understood or documented. It can therefore be difficult to exclude species from the potential list based on a lack of a specific habitat or microhabitat within the study area. As a consequence of this limitation the potential fauna list produced is most likely an overestimation of those species that actually utilise the study area for some purpose. Some species may be present in the general area but may only use the study area itself on rare occasions or as vagrants/transients.

In recognition of survey limitations, a precautionary approach has been adopted for this assessment. Any fauna species that would possibly occur within the study area (or immediately adjacent), as identified through ecological databases, publications, discussions with local experts/residents and the habitat knowledge of the Author, has been assumed to potentially occur in the study area.

During the black cockatoo habitat survey a search for trees containing hollows was completed. It should be noted that identifying hollows suitable for fauna species from ground level has limitations. Generally, the full characteristics of any hollow seen are not fully evident (e.g. internal dimensions). It is also difficult to locate all hollows within all trees as some are not observable from ground level.

The location of observations was recorded using a handheld GPS. The accuracy of the GPS cannot be guaranteed above a level of about 5 to 10 metres, though it should be noted that in some circumstance the accuracy can increase or decrease beyond this range.

## **5. RESULTS**

### **5.1 POTENTIAL FAUNA INVENTORY – LITERATURE REVIEW**

A list of fauna species considered most likely to occur in the study area has been compiled from information obtained during the literature review and is presented in Appendix B. This listing was refined after information gathered during the site reconnaissance survey was assessed.

The results of some previous fauna surveys carried out in the general area are summarised in this species listing as are the DPaW NatureMap database search results. The list of potential fauna takes into consideration that firstly the species in question is not

known to be locally extinct and secondly that suitable habitat for each species, as identified during the habitat assessment, is present within the study area. Species considered unlikely to occur with the study area but previously recorded in other surveys and/or which appear in the DPaW/EPBC Act database searches are therefore not listed. For immediate reference the raw database search results from NatureMap (DPaW 2017b) and the Protected Matters Search Tool (DotE 2017) are contained within Appendix C.

Compiling an accurate fauna list has limitations (see Section 4 above) and therefore, as previously discussed, the listing is likely to be an overestimation of the fauna species actually present within the study area at any one time.

## 5.2 SITE SURVEYS


### 5.2.1 Fauna Habitat Assessment




The study area is located over an existing two lane road and the adjoining road reserve which is almost totally cleared of native remnant vegetation. Most of the native vegetation is associated with the Maidens Reserve which borders the study area along a part of its western boundary. In the north, this vegetation is primarily a low coastal shrubland that grades into a tuart (*Eucalyptus gomphocephala*) woodland over peppermint (*Agonis flexuosa*) low open woodland southwards, though the actual number of trees within the study area is small.

The balance of the study area is represented by areas of no vegetation (bare sand/grass/weeds) or by relatively sparse planted endemic and non-endemic species including non-endemic eucalypts (species unknown), a number of *Acacia* spp., sheoak (*Allocasuarina* sp.), peppermint, paperbark (*Melaleuca* sp.) and shrubs.

Descriptions and examples images of the vegetation present within the study area are provided in Table 1.

**Table 1: Example Images of Fauna Habitats within the Study Area**

Description	Example Image
<p>View looking south east along western side of Ocean Drive in the northern section of study area.</p> <p>Low coastal shrubland borders the study area along its western boundary but bare sand, grass and weeds border the road where proposed works will take place.</p>	

Description	Example Image
<p>View looking south along the western side of Ocean Drive north of Hammond Road.</p> <p>Scattered tuarts and peppermint over grass and weeds.</p>	
<p>View looking south along the western side of Ocean Drive in the central section of the study area.</p> <p>Grass and weeds.</p>	
<p>View looking north along Ocean drive in the southern section of the study area.</p> <p>Various planted endemic and non-endemic trees and shrubs with large sections of grass.</p>	

Overall fauna habitat values at the study area have been severely compromised by the removal of most of the original native vegetation. The study area lacks most natural attributes and is now only likely to be utilised by generally common and widespread fauna species with non-specific requirements which allow them to persist in disturbed/highly disturbed habitats. The fact that the Maidens Reserve borders the study area increases the likelihood of some species being present given that large areas of much better habitat is present in this area.

Given the poor habitat values present and its limited extent, populations of the listed potential species known from the area could not persist within the study area itself, with



most using the site as part of larger home ranges that would in many cases extend into the Maidens Reserve bushland.

## 5.2.2 Opportunistic Fauna Observations

Opportunistic fauna observations are listed in Appendix B. Only seven fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the study area during the single day time survey. The lack of observations can largely be attributed to the poor quality of the habitats present and their very limited extent.

No evidence of any listed threatened, migratory or priority species using the site was observed during any of the site surveys.

## 5.2.3 Western Ringtail Possum Assessment

No evidence of WRPs using the study area was found (i.e. no dreys, scats or individuals).

The lack of observations of WRPs within the study area can be attributed to the poor quality of habitat present. While the study area contains some peppermint trees, a plant species often associated with the presence of WRPs, they are limited in number, most of the trees are small and there is a lack of canopy connectivity.

The survey results indicate that study area is not an area of significance for western ringtail possums.

## 5.2.4 Black Cockatoo Habitat Assessment

### 5.2.4.1 Black Cockatoo Breeding Habitat

Trees considered potentially suitable for black cockatoos to use as nesting habitat (using DotEE criteria - SEWPaC 2012, but ultimately subject to a suitable hollow being present or developing and a range of other factors) which were found within the study was limited to one species:

- Tuart - *Eucalyptus gomphocephala*.

A summary of the potential black cockatoo habitat trees observed within the survey area is provided in Table 2 below and their location shown in Figure 2.

The assessment identified one single tree within the study area with a DBH of  $\geq 50$ cm. This tree was not observed to contain hollows of any size.

**Table 2: Summary of Potential Black Cockatoo Habitat Trees (DBH  $\geq$ 50cm) within the Study area**

Total Number of Habitat Trees	Number of Trees with <u>No Hollows</u> Observed	Number of Trees with Hollows Considered <u>Unsuitable</u> for Nesting Black Cockatoos	Number of Trees with Hollows Considered <u>Possibly Suitable</u> for Nesting Black Cockatoos
1	1	0	0

Additional details on the single habitat tree present within the study area (and two additional trees close to the study area boundary) can be found in Appendix D.

#### 5.2.4.2 Black Cockatoo Foraging Habitat

The study area was found to lack any of the primary plant species (e.g. marri and jarrah) foraged upon by black cockatoos with no specimens or evidence of feeding being observed.

Some of the tree (e.g. tuarts and sheoak) and shrub species (e.g. *Callistemon* sp.) are documented as a food source for cockatoos but their overall contribution to the total foraging resource would be small given the fact some are represented by only a small number of specimens and all are generally not eaten to the same degree as other more favoured plant species.

No evidence of black cockatoos foraging within the study area was observed during the survey period. This can be attributed to the almost total absence of any quality foraging habitat and the small number of favoured plants species.

#### 5.2.4.3 Black Cockatoo Roosting Habitat

No existing roosting trees (trees used at night by black cockatoos to rest) were positively identified during the survey.

### 5.3 FAUNA INVENTORY – SUMMARY

#### 5.3.1 Vertebrate Fauna

Table 3 summarises the number of vertebrate fauna species potentially occurring within or utilising at times the study area, based on results from the desktop study and observations made during the field assessment. A complete list of vertebrate fauna possibly inhabiting or frequenting the study area is held in Appendix B.

Not all species listed as potentially occurring within the study area in existing databases and publications (i.e. *EPBC Act* Threatened Fauna and Migratory species lists, DPaW’s NatureMap database, various reports and publications) are shown in the expected listing in Appendix B. Some species have been excluded from this list based largely on the lack of suitable habitat within the study area and in the general area or known local extinction, even if suitable habitat is present.

Despite the omission of some species it should be noted that the list provided is still very likely an over estimation of the fauna species utilising the study area (either on a regular or infrequent basis) because of the precautionary approach adopted for the assessment. At any one time, only a subset of the listed potential species is likely to be present within the bounds of the study area.

**Table 3: Summary of Potential Vertebrate Fauna Species (as listed in Appendix B)**

Group	Total number of <u>Potential</u> species	Potential number of <u>Specially Protected</u> species	Potential number of <u>Migratory</u> species	Potential number of <u>Priority</u> species	Number of species <u>recorded</u> during field survey
Amphibians	2	0	0	0	0
Reptiles	8	0	0	0	0
Birds	49 <sup>5</sup>	4	1	0	6
Non-Volant Mammals	9 <sup>5</sup>	2	0	0	1
Volant Mammals (Bats)	9	0	0	1	0
<b>Total</b>	<b>76<sup>10</sup></b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>7</b>

Superscript = number of introduced species included in total.

Most of the potential fauna species listed are common widespread bird species, and their presence is linked to their high degree of mobility. As the study area is highly degraded most other species would only occur infrequently or if resident onsite, in very low numbers. None of the threatened species that potentially occur are likely to be resident within the study area itself.

### 5.3.2 Vertebrate Fauna of Conservation Significance

A review of the *EPBC Act* threatened fauna list, DPaW’s Threatened Fauna Database and Priority List, unpublished reports and scientific publications identified a number of specially protected, priority or migratory vertebrate fauna species as potentially occurring in the general vicinity of the study area. Of these species, most that have no potential



whatsoever to utilise the study area for any purpose have been omitted from the potential list (Appendix B), principally due to lack of suitable habitat (including extent and/or quality e.g. seabirds) or known local extinction (western whipbird).

Based on the habitats present and current documented distributions it is considered possible that eight species of conservation significance may use the study area for some purpose at times, though, as no evidence of any using the study area at the time of the field survey was found, the status of some in the area remains uncertain. These species are:

- Carnaby's Black-Cockatoo *Calyptorhynchus latirostris* – S2 (WC Act), Endangered (EPBC Act)  
No evidence of this species using the study area was found but as the site is within the known distribution of the species and given it is highly mobile it may occasionally occur. It would however not breed onsite as there are no suitable hollows and foraging habitat is limited in extent and of very poor quality. No signs of overnight roosting evident.
- Forest Red-tailed Black-Cockatoo *Calyptorhynchus banksii naso* – S3 (WC Act), Vulnerable (EPBC Act)  
No evidence of this species using the study area was found but as the site is within its known distribution and given it is highly mobile it may occasionally occur. It would however not breed onsite as there are no suitable hollows and foraging habitat is limited in extent and of very poor quality. No signs of overnight roosting evident.
- Baudin's Black-Cockatoo *Calyptorhynchus baudinii* – S2 (WC Act), Vulnerable (EPBC Act)  
No evidence of this species using the study area was found but as the site is within its known distribution and given it is highly mobile it may occasionally occur. It would however not breed onsite as there are no suitable hollows and foraging habitat is limited in extent and of very poor quality. No signs of overnight roosting evident.
- Peregrine Falcon *Falco peregrinus* – S7 (WC Act)  
This species potentially utilises some sections of the study area as part of a much larger home range and therefore it may occur occasionally. It would however not breed onsite as there are no suitable nest sites.
- Rainbow Bee-eater *Merops ornatus* – S5 (WC Act), Migratory (EPBC Act)  
This species is a common seasonal visitor to south west. May roost and forage onsite though proximity to traffic may limit this activity. Unlikely to breed onsite and even if it did population levels would not be significant as it usually breeds only in pairs, rarely in small colonies (Johnstone and Storr 1998).

- South-west Brush-tailed Phascogale *Phascogale tapoatafa wambenger* – S6 (WC Act)  
No evidence of this species using the study area was found but as the site is within its known distribution and there is better quality habitat within the Maidens Reserve and some other nearby reserves transient individuals may occasionally be present.
- Western Ringtail Possum *Pseudocheirus occidentalis* – S1 (WC Act), Vulnerable (EPBC Act)  
No evidence of this species using the study area was found but as the site is within its known distribution and there is better quality habitat within the Maidens Reserve and some other nearby reserves transient individuals may occasionally occur.
- Western False Pipistrelle *Falsistrellus mackenziei* – P4 (DPaW Priority Species)  
The status of this species onsite is uncertain however it may forage onsite occasionally. Would not roost in the study area as there is a lack of suitable hollows.

While the abovementioned species are all indicated as possibly occurring within the study area their reliance on the site would appear to be low given the poor quality of the habitat present and its limited extent. Most are likely to only occur infrequently and then only temporarily.

A number of other species of conservation significance, while possibly present in the wider area are not considered to be potential species due to known localised extinction (and no subsequent recruitment from adjoining areas) or the obvious lack of suitable habitat.

## 6. POTENTIAL IMPACTS OF DEVELOPMENT

In general, the most significant potential impacts to fauna of any development include:

- Loss of vegetation/fauna habitat that may be used for foraging, breeding, roosting, or dispersal (includes loss of hollow bearing trees);
- Fragmentation of vegetation/fauna habitat which may restrict the movement of some fauna species;
- Modifications to surface hydrology, siltation of creek lines;
- Changes to fire regimes;
- Pollution (e.g. oil spills);
- Noise/Light/Dust;
- Spread of plant pathogens (e.g. dieback) and weeds;
- Potential increase in the number of predatory introduced species (e.g. cats);

- Death or injury of fauna during clearing and construction; and
- An increase in fauna road kills after development.

Based on the extent of proposed clearing and each species likely status in the study area and associated degree of reliance on the habitats present (related to habitat quality/value and existing degree of fragmentation), the likely impacts related to this project has been assessed, a summary of which is provided in Table 4 below.

**Table 4: Likelihood of Occurrence and Possible Impacts – Fauna Species of Conservation Significance** (continues on following pages).

Common Name	Genus & Species	Conservation Status (See Appendix A for codes)	Habitat Present	Likelihood of Occurrence	Possible Impacts/ Significance of Possible Impacts
Pouched Lamprey	<i>Geotria australis</i>	P1	No	Would Not Occur.	No impact.
Coastal Plains Skink	<i>Ctenotus ora</i>	P3	No	Would Not Occur.	No impact.
Australasian Bittern	<i>Botaurus poiciloptilus</i>	S2, EN	No	Would Not Occur.	No impact.
Little Bittern	<i>Ixobrychus minutus</i>	P4	No	Would Not Occur.	No impact.
Eastern Great Egret	<i>Ardea alba (modesta)</i>	S5, Mig	No	Would Not Occur.	No impact.
Cattle Egret	<i>Ardea ibis</i>	S5, Mig	No	Would Not Occur.	No impact.
Other Migratory Shorebirds/Wetland Species/Seabirds	Various	Mig, Various	No	Would Not Occur.	No impact.
Blue-billed Duck	<i>Oxyura australis</i>	P4	No	Would Not Occur.	No impact.
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Mig	No	Would Not Occur.	No impact.
Eastern Osprey	<i>Pandion haliaetus</i>	S5, Mig	No	Would Not Occur.	No impact.
Peregrine Falcon	<i>Falco peregrinus</i>	S7	Yes	Possible but only rarely.	Loss of a small area of low quality habitat/Very low-negligible impact.
Fork-tailed Swift	<i>Apus pacificus</i>	S5, Mig	Yes	Unlikely, Flyover only on very rare occasions.	No impact.
Rainbow Bee-eater	<i>Merops ornatus</i>	S5, Mig	Yes	Possible	Loss of a small area of low quality habitat/Very low-negligible impact.
Grey Wagtail	<i>Motacilla cinerea</i>	S5, Mig	No	Would Not Occur.	No impact.
Carnaby's Black Cockatoo	<i>Calyptorhynchus latirostris</i>	S2, EN	Yes/Marginal	Possible	Loss of a small area of low quality habitat/Very low-negligible impact.

Common Name	Genus & Species	Conservation Status (See Appendix A for codes)	Habitat Present	Likelihood of Occurrence	Possible Impacts/ Significance of Possible Impacts
Baudin`s Black Cockatoo	<i>Calyptorhynchus baudinii</i>	S2, VU	Yes/Marginal	Possible	Loss of a small area of low quality habitat/ Very low-negligible impact.
Forest Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii naso</i>	S3, VU	Yes/Marginal	Possible	Loss of a small area of low quality habitat/ Very low-negligible impact.
South-west Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>	S6	No/Marginal	Possible	Loss of a small area of low quality habitat/ Very low-negligible impact.
Chuditch	<i>Dasyurus geoffroii</i>	S3, VU	No	Would Not Occur.	No impact.
Southern Brown Bandicoot	<i>Isodon obesulus fusciventer</i>	P4	No	Would Not Occur.	No impact.
Western Ringtail Possum	<i>Pseudocheirus occidentalis</i>	S1, VU	Yes/Marginal	Possible	Loss of a small area of low quality habitat/ Very low-negligible impact.
Western Brush Wallaby	<i>Macropus irma</i>	P4	No	Would Not Occur.	No impact.
Quokka	<i>Setonix brachyurus</i>	S3, VU	No	Would Not Occur.	No impact.
Western False Pipistrelle	<i>Falsistrellus mackenziei</i>	P4	Yes/Marginal	Possible probably only rarely.	Loss of a small area of low quality habitat/ Very low-negligible impact
Water Rat	<i>Hydromys chrysogaster</i>	P4	No	Would Not Occur.	No impact.

Overall impacts on fauna which may result because of development within the study area are expected to be nonexistence or negligible. Impacts if they were to occur are only expected to be low and relate to the loss of very small areas of highly degraded habitat of very limited extent.

## 7. ENVIRONMENT PROTECTION & BIODIVERSITY ACT 1999

If an action (i.e. the proposed clearing of some vegetation from Ocean Drive) is deemed to have a potential “significant impact” on listed species a referral to the Department of the Environment and Energy (DotEE) is required to ensure compliance with the *EPBC Act*. Currently, “significant impact” is defined within one document, this being:

- Department of the Environment (DotE) (2013). Matters of National Environmental Significance. Significant Impact Guidelines 1.1, *EPBC Act 1999*.

The DotEE have also released referral guidelines for black cockatoos and western ringtail possums which detail what scale of actions potentially constitute “significant impact” and therefore require referral, these being:

- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2012). *EPBC Act Referral guidelines for three threatened black cockatoo species: Carnaby’s cockatoo (endangered) *Calyptorhynchus latirostris*, Baudin’s cockatoo (vulnerable) *Calyptorhynchus baudinii*, Forest red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksii naso*.*
- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008). Background Paper to the *EPBC Act Policy Statement 3.10 – Nationally Threatened Species and Ecological Communities*. “Significant Impact Guidelines for the vulnerable western ringtail possum (*Pseudocheirus occidentalis*) in the southern Swan Coastal Plain, Western Australia”; and
- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2009). *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Policy Statement 3.10 “Significant Impact Guidelines for the vulnerable western ringtail possum (*Pseudocheirus occidentalis*) in the southern Swan Coastal Plain, Western Australia*.

An assessment of the need to refer the project to DotEE using criteria within the relevant referral guidelines are provided below.

## 7.1 WESTERN RINGTAIL POSSUMS

The DotEE document titled “Significant Impact Guidelines for the vulnerable western ringtail possum (*Pseudocheirus occidentalis*) in the southern Swan Coastal Plain, Western Australia” (DEWHA 2009) summarises what scale of actions would be considered likely to have a significant impact on WRPs in the Bunbury area.

Within the policy statement an action is deemed likely to have a significant impact on the WRP in the southern Swan Coastal Plain region if it:

- reduces the ability of the region to support the persistence of the western ringtail possum; or
- modifies, destroys, removes or isolates important remnant habitat patches, or decreases the availability or quality of remnant habitat patches; or
- adversely affects connections between important areas; or
- interferes substantially with the ability of the area to effectively contribute to the recovery of the species.

The guidelines have also categorised certain areas between Bunbury and Dunsborough as “Core Habitat”, “Primary Corridors” or “Supporting Habitat”. The Ocean Drive study area falls within the area defined as “Supporting Habitat” (also referred to as Area 3). As

defined in the guidelines a significant impact on WRPs is deemed as “likely” if there is a real chance or possibility that an action within in the defined Area 3 will result in:

- any clearing of a remnant habitat patch that is greater than 0.5 hectares in size;
- the clearing of more than 50% of a remnant habitat patch that is between 0.2 and 0.5 hectares in size;
- the fragmentation of any existing habitat linkages.

Vegetation within the Ocean Drive study area is represented by a small number of scattered trees, small groups of trees (including non-endemic, planted species) and some areas of planted, low shrubs. While a small number of generally small, scattered peppermint trees are present the overall area cannot be regarded as a “remnant habitat patch” of any significance to WRPs.

None of the abovementioned criteria will therefore be compromised and the likelihood of “significant impact” as defined within the referral guidelines can be regarded as low/negligible. This is supported by observations made during the site inspection where the habitat present was found to be relatively poor in quality (i.e. relatively small peppermint trees and a lack of canopy continuity), the fact that the vegetation onsite does not appear to be in current use by WRPs, given no evidence of their presence was found during the targeted day and night surveys.

Based on available information, it is therefore the Authors opinion, that the DotEE would not consider the proposal to be a “controlled action” with respect to impacts on the western ringtail possum or its habitat.

## **7.2 BLACK COCKATOOS**

The following points provide general guidance on what, in DotEE’s view, may constitute a high or low risk of “significant impact” on black cockatoos as well as providing some guidance on uncertainty.

### Actions that have a high risk of significant impacts

- Clearing of any known nesting tree.
- Clearing or degradation of any part of a vegetation community known to contain breeding habitat.
- Clearing of more than 1 ha of quality foraging habitat.
- Clearing or degradation (including pruning the top canopy) of a known night roosting site.

- Creating a gap of greater than 4 km between patches of black cockatoo habitat (breeding, foraging or roosting).

Actions that have and uncertain risk of significant impacts

- Degradation (such as through altered hydrology or fire regimes) of more than 1 ha of foraging habitat. Significance will depend on the level and extent of degradation and the quality of the habitat.
- Clearing or disturbance in areas surrounding black cockatoo habitat that has the potential to degrade habitat through introduction of invasive species, edge effects, hydrological changes, increased human visitation or fire.
- Actions that do not directly affect the listed species but that have the potential for indirect impacts such as increasing competitors for nest hollows.
- Actions with the potential to introduce known plant diseases such as *Phytophthora* spp. to an area where the pathogen was not previously known.

Actions that have a low risk of significant impacts

- Actions that do not affect black cockatoo habitat or individuals.
- Actions whose impacts occur outside the modelled distribution of the three black cockatoos

The Ocean Drive study area was found to contain only one trees which would be regarded by the DotEE as representing potential black cockatoo breeding habitat based solely on its trunk size (i.e. DBH  $\geq$ 50cm). The removal of this trees will therefore compromise one of the abovementioned criteria (i.e. clearing or degradation of any part of a vegetation community known to contain breeding habitat (any tree with a DBH  $\geq$ 50cm)) and therefore by default represents an action potentially having a “high risk of significant impact” on black cockatoos.

No other criteria listed in the referral guidelines will be compromised by clearing of some or all the vegetation within the study area.

It should be noted that the guidelines are “general in nature” (SEWPaC 2012) and therefore actions will, if referred, be assessed by the DotEE on a “case by case” basis to determine if they are in fact a “controlled action” requiring approval under the *EPBC Act*.

Based on available information, it is the Authors opinion, despite the proposed clearing of some of the vegetation within the study area being an action deemed as potentially having a “high risk of significant impact”, that the DotEE would not consider the proposal to be a “controlled action”.

This conclusion is based on the fact that only one habitat tree is involved, the fact that it is not currently in use as actual breeding habitat by black cockatoos (with no possible large hollows appearing to be present), and the total absence of quality foraging habitat in the immediate vicinity. It is therefore considered highly unlikely that the clearing of the vegetation in question would have a “significant impact” on the status of any of the three species of black cockatoo frequenting the general area.

## **8. CONCLUSION**

Based on the results of this assessment it is the Authors opinion that no significant impact on threatened fauna species listed under the *EPBC Act* will occur because of clearing of vegetation from within the Ocean Drive study area. This conclusion is primarily based on the very limited amount of habitat that will be affected and/or its relatively poor quality.

This would suggest that, if the City were to refer the proposed development to the DotEE for review, clearing of the vegetation in question would be assessed as “not a controlled action” and therefore would not require further assessment or approval under the *EPBC Act* before it could proceed. As such submission of a referral in the first instance would seem unwarranted.



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# FIGURES





**Legend**

 Ocean Drive Study Area



0      250      500  
 Metres



Drawn: G Harewood

Date: June 2017

Scale: 1:9,500

Projection/Coordinate System: UTM/MGA Zone 50

Ocean Drive  
 Upgrade Project



**Study Area  
 Air Photo**

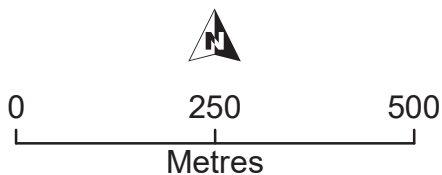
Figure: 1





**Legend**

-  Ocean Drive Study Area
-  Habitat Tree  
No hollows observed



Drawn: G Harewood  
Date: June 2017  
Scale: 1:9,500

Ocean Drive Upgrade Project

**Habitat Trees  
(DBH<sub>></sub>50cm)**



# **APPENDIX A**

## **CONSERVATION CATEGORIES**

## EPBC Act (1999) Threatened Fauna Categories

Threatened fauna may be listed under Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* in any one of the following categories:

Category	Code	Description
Extinct	E	There is no reasonable doubt that the last member of the species has died.
*Extinct in the wild	EW	A species (a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) 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.
*Critically Endangered	CE	A species is facing an extremely high risk of extinction in the wild in the immediate future.
*Endangered	EN	A species: (a) is not critically endangered; and (b) is facing a very high risk of extinction in the wild in the near future.
*Vulnerable	VU	A species (a) is not critically endangered or endangered; and (b) is facing a high risk of extinction in the wild in the medium-term future.
Conservation Dependent	CD	A species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered
*Migratory	Migratory	(a) all migratory species that are: (i) native species; and (ii) from time to time included in the appendices to the Bonn Convention; and (b) all migratory species from time to time included in annexes established under JAMBA, CAMBA and ROKAMBA; and (c) all native species from time to time identified in a list established under, or an instrument made under, an international agreement approved by the Minister.
Marine	Ma	Species in the list established under s248 of the <i>EPBC Act</i>

Note: Only species in those categories marked with an asterisk are matters of national environmental significance (NES) under the *EPBC Act*.



## Wildlife Conservation (Specially Protected Fauna) Notice 2015 Categories

Published as Specially Protected under the *Wildlife Conservation Act 1950*, and listed under Schedules 1 to 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.

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.

Category	Code	Description
Schedule 1 Critically Endangered species	CR	Threatened species considered to be facing an extremely high risk of extinction in the wild.
Schedule 2 Endangered species	EN	Threatened species considered to be facing a very high risk of extinction in the wild.
Schedule 3 Vulnerable species	VU	Threatened species considered to be facing a high risk of extinction in the wild.
Schedule 4 Presumed extinct species	EX	Species which have been adequately searched for and there is no reasonable doubt that the last individual has died.
Schedule 5 Migratory birds protected under an international agreement	IA	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 the Bonn Convention, relating to the protection of migratory birds.
Schedule 6 Fauna that is of special conservation need as conservation dependent fauna	CD	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
Schedule 7 Other specially protected fauna.	OS	Fauna otherwise in need of special protection to ensure their conservation.

## Western Australian DPaW Priority Fauna Categories

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna 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 flora or fauna.

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.

Category	Code	Description
Priority 1 Poorly Known Species.	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.
Priority 2 Poorly Known Species.	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.
Priority 3 Poorly Known Species.	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.
Priority 4 Rare, Near Threatened and other species in need of monitoring.	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 do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.</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>

\*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).

## ***IUCN Red List Threatened Species Categories***

The *IUCN Red List of Threatened Species*<sup>™</sup> is a checklist of taxa that have undergone an extinction risk assessment using the *IUCN Red List Categories and Criteria*.

Categories are summarized below.

<b>Category</b>	<b>Code</b>	<b>Description</b>
Extinct	EX	Taxa for which there is no reasonable doubt that the last individual has died.
Extinct in the Wild	EW	Taxa which is known only to survive in cultivation, in captivity or and as a naturalised population well outside its past range and it has not been recorded in known or expected habitat despite exhaustive survey over a time frame appropriate to its life cycle and form.
Critically Endangered	CR	Taxa facing an extremely high risk of extinction in the wild.
Endangered	EN	Taxa facing a very high risk of extinction in the wild.
Vulnerable	VU	Taxa facing a high risk of extinction in the wild.
Near Threatened	NT	Taxa which has been evaluated but does not qualify for CR, EN or VU now but is close to qualifying or likely to qualify in the near future.
Least Concern	LC	Taxa which has been evaluated but does not qualify for CR, EN, VU, or NT but is likely to qualify for NT in the near future.
Data Deficient	DD	Taxa for which there is inadequate information to make a direct or indirect assessment of its risk of extinction based on its distribution and/or population status.
Not Evaluated	NE	Taxa which has not been evaluated.

A full list of categories and their meanings are available at:

<http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria>

# **APPENDIX B**

## **LIST OF OBSERVED AND POTENTIAL FAUNA**

# List of Observed and Potential Fauna

Approx. centroid = -33.36531°S and 115.62497° E

Compiled by Greg Harewood - June 2017

Recorded (Captured/Sighted/Heard/Signs) = X

## Ocean Drive Study Area, Withers/South Bunbury, W.A.

A = Harewood, G (2017). Fauna Assessment Ocean Drive Upgrade Project. Unpublished report for the CoB.

B = ATA Environmental (1998). Vertebrate Fauna Dalyellup Beach Estate Shire of Capel. Unpublished report for Homeswest/Home Building Society and Satterley Real Estate.

C = Bow, B. (1999). The biogeography of the ground vertebrate fauna of the southern Swan Coastal Plain, Bunbury, W.A. B.Sc (Hons) Thesis, Curtin University of Technology. (Reptiles Only).

+ McNee, S (1987). Avifaunan Surveys of Ludlow Tuart Forests, Minninup and the old Yoganup Mine Site Capel, Western Australia. Report for Westralian Sands Ltd. (Birds Only).

D = HGM (2002). Natural Values of 12 Sites of the Greater Bunbury Region Scheme. Tasks 1, 2 and 3. Unpublished report for WAPC (Muddy Lakes Fauna Survey (Level 2) results).

E = Harewood, G. (2008). Fauna Assessment Survey (Level 2), Lot 187, Stratham. Unpublished report for MBS Environmental.

F = Leschenault CP - 360 Environmental Pty Ltd (2008). Southern Seawater Desalination Project 2007, Terrestrial Flora and Fauna Survey Report. Unpublished report for the Water Corporation.

G = Binningup - 360 Environmental Pty Ltd (2008). Southern Seawater Desalination Project 2007, Terrestrial Flora and Fauna Survey Report. Unpublished report for the Water Corporation.

H = DPaW (2017). NatureMap Database search. "By Circle"115° 37' 30" E, 33° 21' 55" S – (plus 5km buffer). Accessed 04/06/2017.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
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## Amphibia

### Myobatrachidae

Ground or Burrowing Frogs

<i>Heleioporus eyrei</i>	Moaning Frog	LC		X	X		X	X	X	X
<i>Limnodynastes dorsalis</i>	Western Banjo Frog	LC		X	X	X	X		X	X

## Reptilia

### Gekkonidae

Geckoes

<i>Christinus marmoratus</i>	Marbled Gecko			X	X	X	X	X	X	X
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WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DPaW Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
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### Scincidae

Skinks

<i>Acritoscincus trilineatum</i>	Southwestern Cool Skink			X		X		X		
<i>Cryptoblepharus buchananii</i>	Fence Skink			X	X		X	X		X
<i>Hemiergis quadrilineata</i>	Three-toed Mulch Skink			X	X		X	X	X	X
<i>Lerista elegans</i>	West Coast Four-toed Lerista			X	X		X	X	X	X
<i>Menetia greyii</i>	Dwarf Skink			X	X		X	X	X	X
<i>Tiliqua rugosa</i>	Bobtail			X	X	X	X	X	X	X

### Elapidae

Elapid Snakes

<i>Pseudonaja affinis</i>	Dugite				X	X	X	X	X	
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## Aves

### Accipitridae

Kites, Goshawks, Eagles, Harriers

<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	Bp LC		X						
<i>Accipiter fasciatus</i>	Brown Goshawk	Bp LC					X		X	X
<i>Haliastur sphenurus</i>	Whistling Kite	Bp LC		X	X	X	X	X		X

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Falconidae</b> Falcon							
<i>Falco berigora</i>	Brown Falcon	Bp LC			X					X
<i>Falco cenchroides</i>	Australian Kestrel	LC					X		X	X
<i>Falco longipennis</i>	Australian Hobby	LC		X	X	X	X			X
<i>Falco peregrinus</i>	Peregrine Falcon	S7 Bp LC							X	
<b>Columbidae</b> Pigeons, Doves										
<i>Columba livia</i>	Domestic Pigeon	Introduced		X						X
<i>Phaps chalcoptera</i>	Common Bronzewing	Bh LC		X	X	X	X	X	X	X
<i>Streptopelia chinensis</i>	Spotted Turtle-Dove	Introduced								
<i>Streptopelia senegalensis</i>	Laughing Turtle-Dove	Introduced		X						X

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DPaW Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Psittacidae</b> Parrots							
<i>Cacatua roseicapilla</i>	Galah	LC	X	X		X	X		X	
<i>Cacatua sanguinea</i>	Little Corella	Introduced								X
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo	S3 VU Be LC					X			X
<i>Calyptorhynchus baudinii</i>	Baudin's Black Cockatoo	S2 VU Bp EN C2a(ii)		X						X
<i>Calyptorhynchus latirostris</i>	Carnaby's Black Cockatoo	S2 EN Bp EN A2bcde					X		X	X
<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet	LC				X				X
<i>Neophema elegans</i>	Elegant Parrot	LC			X				X	X
<i>Platycercus icterotis icterotis</i>	Western Rosella (western ssp)	Bp LC		X	X	X				
<i>Platycercus spurius</i>	Red-capped Parrot	LC		X	X	X	X			X
<i>Platycercus zonarius</i>	Australian Ringneck Parrot	LC	X	X	X	X	X	X	X	
<i>Polytelis anthopeplus</i>	Regent Parrot	LC	X	X		X	X			X
<b>Strigidae</b> Hawk Owls										
<i>Ninox novaeseelandiae</i>	Boobook Owl	LC		X					X	X

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DPaW Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.



Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Tytonidae</b> Barn Owls							
<i>Tyto alba</i>	Barn Owl	LC								
<b>Halcyonidae</b> Tree Kingfishers										
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Introduced		X		X	X			X
<i>Todiramphus sanctus</i>	Sacred Kingfisher	LC				X		X		X
<b>Meropidae</b> Bee-eaters										
<i>Merops ornatus</i>	Rainbow Bee-eater	S5 Ma Mig JA LC				X	X		X	X
<b>Acanthizidae</b> Thornbills, Geryones, Fieldwrens & Whitefaces										
<i>Acanthiza apicalis</i>	Broad-tailed Thornbill	Bh LC		X	X	X	X	X	X	X
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	Bh LC		X		X	X			X
<i>Gerygone fusca</i>	Western Gerygone	LC		X	X	X	X	X	X	X
<i>Smicromis brevirostris</i>	Weebill	Bh LC	X	X	X	X	X	X	X	X

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DPaW Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Pardalotidae</b> Pardalotes							
<i>Pardalotus punctatus</i>	Spotted Pardalote	LC		X						
<i>Pardalotus striatus</i>	Striated Pardalote	LC		X		X	X	X	X	X
<b>Meliphagidae</b> Honeyeaters, Chats										
<i>Anthochaera carunculata</i>	Red Wattlebird	LC	X	X	X	X	X	X	X	X
<i>Lichenostomus virescens</i>	Singing Honeyeater	LC		X	X				X	
<i>Lichmera indistincta</i>	Brown Honeyeater	LC		X	X	X			X	X
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	Bp LC		X	X	X			X	X
<b>Dicruridae</b> Monarchs, Magpie Lark, Flycatchers, Fantails, Drongo										
<i>Grallina cyanoleuca</i>	Magpie-lark	LC		X		X	X			X
<i>Rhipidura fuliginosa</i>	Grey Fantail	LC		X	X	X	X	X	X	
<i>Rhipidura leucophrys</i>	Willie Wagtail	LC		X	X	X	X		X	X
<b>Campephagidae</b> Cuckoo-shrikes, Trillers										
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	LC		X	X	X	X	X	X	X

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DPaW Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Artamidae</b> Woodswallows, Butcherbirds, Currawongs							
<i>Artamus cinereus</i>	Black-faced Woodswallow	Bp LC				X	X			X
<b>Cracticidae</b> Currawongs, Magpies & Butcherbirds										
<i>Cracticus tibicen</i>	Australian Magpie	LC		X		X	X	X		X
<i>Cracticus torquatus</i>	Grey Butcherbird	LC		X		X	X	X	X	X
<b>Corvidae</b> Ravens, Crows										
<i>Corvus coronoides</i>	Australian Raven	LC	X	X		X	X	X	X	X
<b>Motacillidae</b> Old World Pipits, Wagtails										
<i>Anthus australis</i>	Australian Pipit	LC			X					
<b>Hirundinidae</b> Swallows, Martins										
<i>Hirundo neoxena</i>	Welcome Swallow	LC		X	X	X	X			X
<i>Hirundo nigricans</i>	Tree Martin	LC		X	X	X	X			
<b>Zosteropidae</b> White-eyes										
<i>Zosterops lateralis</i>	Silvereye	LC		X	X	X	X	X	X	X

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DPaW Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
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## Mammalia

### Dasyuridae

Carnivorous Marsupials

<i>Phascogale tapoatafa wambenger</i>	South-west Brush-tailed Phascogale	S6 NT					X			X
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### Phalangeridae

Brush-tail Possums, Cuscuses

<i>Trichosurus vulpecula</i>	Common Brushtail Possum	LC					X		X	
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### Pseudocheiridae

Ringtail Possums

<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	S1 VU VU B1ab(ii,iii,v)				X	X		X	X
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### Macropodidae

Kangaroos, Wallabies

<i>Macropus fuliginosus</i>	Western Grey Kangaroo	LC	X			X	X		X	X
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### Molossidae

Freetail Bats

<i>Austronomus australis</i>	White-striped Freetail-bat	LC				X				X
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<i>Ozimops kitcheneri</i>	Southern Freetail-bat	LC								X
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WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DPaW Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Vespertilionidae</b> Ordinary Bats							
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	LC					X		X	
<i>Chalinolobus morio</i>	Chocolate Wattled Bat	LC								
<i>Falsistrellus mackenziei</i>	Western False Pipistrelle	P4 NT					X			
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	LC					X			
<i>Nyctophilus gouldi</i>	Gould's Long-eared Bat	LC					X			
<i>Nyctophilus major</i>	Western Long-eared Bat	LC								
<i>Vespadelus regulus</i>	Southern Forest Bat	LC					X			
<b>Muridae</b> Rats, Mice										
<i>Mus musculus</i>	House Mouse	Introduced					X		X	
<i>Rattus rattus</i>	Black Rat	Introduced					X	X		X
<b>Canidae</b> Dogs, Foxes										
<i>Canis lupus familiaris</i>	Dog	Introduced					X		X	
<b>Felidae</b> Cats										
<i>Felis catus</i>	Cat	Introduced					X			

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DPaW Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Leporidae</b> Rabbits, Hares							
<i>Oryctolagus cuniculus</i>	Rabbit	Introduced					X		X	

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DPaW Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

# **APPENDIX C**

## **DPaW & EPBC DATABASE SEARCH RESULTS**

# NatureMap Species Report

Created By Greg Harewood on 04/06/2017

**Kingdom** Animalia  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Method** 'By Circle'  
**Centre** 115° 37' 30" E, 33° 21' 55" S  
**Buffer** 5km  
**Group By** Species Group

Species Group	Species	Records
Amphibian	8	194
Bird	146	3357
Fish	59	89
Invertebrate	40	149
Mammal	17	882
Reptile	20	83
<b>TOTAL</b>	<b>290</b>	<b>4754</b>

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
<b>Amphibian</b>				
1.	25398 <i>Crinia georgiana</i> (Quacking Frog)			
2.	25399 <i>Crinia glauerti</i> (Clicking Frog)			
3.	25400 <i>Crinia insignifera</i> (Squelching Froglet)			
4.	25404 <i>Geocrinia leai</i> (Ticking Frog)			
5.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
6.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
7.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
8.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
<b>Bird</b>				
9.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
10.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
11.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
12.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
13.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
14.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
15.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
16.	24310 <i>Anas castanea</i> (Chestnut Teal)			
17.	24312 <i>Anas gracilis</i> (Grey Teal)			
18.	24313 <i>Anas platyrhynchos</i> (Mallard)			
19.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
20.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
21.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
22.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
23.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
24.	25558 <i>Ardea ibis</i> (Cattle Egret)		IA	
25.	41324 <i>Ardea modesta</i> (Eastern Great Egret)		IA	
26.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
27.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
28.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
29.	24318 <i>Aythya australis</i> (Hardhead)			
30.	<i>Barnardius zonarius</i>			
31.	24319 <i>Biziura lobata</i> (Musk Duck)			
32.	24359 <i>Burhinus grallarius</i> (Bush Stone-curlew)			
33.	25714 <i>Cacatua pastinator</i> (Western Long-billed Corella)			
34.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
35.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
36.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
37.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black-Cockatoo)		T	
38.	24733 <i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo (long-billed black-cockatoo), Baudin's Cockatoo)		T	



Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
39.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)		T	
40.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
41.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
42.	<i>Chroicocephalus novaehollandiae</i>			
43.	24432 <i>Chrysococcyx lucidus</i> subsp. <i>plagosus</i> (Shining Bronze Cuckoo)			
44.	24288 <i>Circus approximans</i> (Swamp Harrier)			
45.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
46.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
47.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
48.	25592 <i>Corvus coronoides</i> (Australian Raven)			
49.	24417 <i>Corvus coronoides</i> subsp. <i>perplexus</i> (Australian Raven)			
50.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
51.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
52.	24322 <i>Cygnus atratus</i> (Black Swan)			
53.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
54.	25618 <i>Diomedea exulans</i> (Wandering Albatross)		T	
55.	30836 <i>Diomedea exulans</i> subsp. <i>exulans</i> (Snowy Albatross)		T	
56.	<i>Egretta garzetta</i>			
57.	<i>Egretta novaehollandiae</i>			
58.	<i>Elanus axillaris</i>			
59.	47937 <i>Elsyornis melanops</i> (Black-fronted Dotterel)			
60.	<i>Eolophus roseicapillus</i>			
61.	24651 <i>Eopsaltria australis</i> subsp. <i>griseogularis</i> (Western Yellow Robin)			
62.	24652 <i>Eopsaltria georgiana</i> (White-breasted Robin)			
63.	24813 <i>Eudyptes chrysocome</i> subsp. <i>filholi</i> (Rockhopper Penguin)			Y
64.	24368 <i>Eurostodopus argus</i> (Spotted Nightjar)			
65.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
66.	25623 <i>Falco longipennis</i> (Australian Hobby)			
67.	25727 <i>Fulica atra</i> (Eurasian Coot)			
68.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
69.	24763 <i>Gallinula tenebrosa</i> subsp. <i>tenebrosa</i> (Dusky Moorhen)			
70.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			
71.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
72.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
73.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			
74.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
75.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
76.	24689 <i>Halobaena caerulea</i> (Blue Petrel)			
77.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
78.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
79.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
80.	<i>Hydroprogne caspia</i>			
81.	25638 <i>Larus pacificus</i> (Pacific Gull)			
82.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
83.	30932 <i>Limosa lapponica</i> (Bar-tailed Godwit)		IA	
84.	25741 <i>Limosa limosa</i> (Black-tailed Godwit)		IA	
85.	<i>Lophoictinia isura</i>			
86.	24690 <i>Macronectes giganteus</i> (Southern Giant Petrel)		IA	
87.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
88.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
89.	25758 <i>Megalurus gramineus</i> (Little Grassbird)			
90.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)		IA	
91.	<i>Microcarbo melanoleucos</i>			
92.	24798 <i>Numenius madagascariensis</i> (Eastern Curlew)		T	
93.	25742 <i>Numenius phaeopus</i> (Whimbrel)		IA	
94.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
95.	24497 <i>Oceanites oceanicus</i> (Wilson's Storm Petrel)		IA	
96.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
97.	24328 <i>Oxyura australis</i> (Blue-billed Duck)		P4	
98.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
99.	24692 <i>Pachyptila belcheri</i> (Slender-billed Prion)			
100.	24693 <i>Pachyptila desolata</i> (Antarctic Prion)			
101.	25707 <i>Pachyptila salvini</i> (Salvin's Prion)			
102.	<i>Pandion cristatus</i>			
103.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
104.	25687 <i>Passer domesticus</i> (House Sparrow)	Y		
105.	24642 <i>Passer montanus</i> (Eurasian Tree Sparrow)	Y		
106.	24649 <i>Pelecanoides urinatrix</i> subsp. <i>exsul</i> (Common Diving Petrel)			
107.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
108.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
109.	48066 <i>Petroica boodang</i> (Scarlet Robin)			
110.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
111.	24664 <i>Phalacrocorax carbo subsp. novaehollandiae</i> (Great Cormorant)			
112.	24665 <i>Phalacrocorax fuscescens</i> (Black-faced Cormorant)			
113.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
114.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
115.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
116.	48071 <i>Phylidonyris niger</i> (White-cheeked Honeyeater)			
117.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
118.	24841 <i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
119.	25720 <i>Platycercus icterotis</i> (Western Rosella)			
120.	24747 <i>Platycercus spurius</i> (Red-capped Parrot)			
121.	24843 <i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
122.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
123.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
124.	24681 <i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
125.	25722 <i>Polytelis anthopeplus</i> (Regent Parrot)			
126.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
127.	24771 <i>Porzana tabuensis</i> (Spotless Crane)			
128.	24388 <i>Psophodes nigrogularis subsp. nigrogularis</i> (Western Whipbird (western heath))		T	
129.	24702 <i>Pterodroma brevirostris</i> (Kerguelen Petrel)			
130.	24703 <i>Pterodroma lessonii</i> (White-headed Petrel)			
131.	<i>Pterodroma macroptera subsp. macroptera</i>			
132.	25711 <i>Pterodroma mollis</i> (Soft-plumaged Petrel)			
133.	24711 <i>Puffinus assimilis subsp. assimilis</i> (Little Shearwater)			
134.	<i>Purpureicephalus spurius</i>			
135.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
136.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
137.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
138.	30948 <i>Smicronis brevirostris</i> (Weebill)			
139.	24522 <i>Sterna bergii</i> (Crested Tern)			
140.	25642 <i>Sterna hirundo</i> (Common Tern)		IA	
141.	25655 <i>Stipiturus malachurus</i> (Southern Emu-wren)			
142.	24554 <i>Stipiturus malachurus subsp. westernensis</i> (Southern Emu-wren)			
143.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
144.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
145.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
146.	34134 <i>Thalassarche carteri</i> (Indian Yellow-nosed Albatross)		T	
147.	44607 <i>Thalassarche melanophris</i> (Black-browed Albatross)		T	
148.	<i>Thalasseus bergii</i>			
149.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
150.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
151.	24755 <i>Trichoglossus haematodus subsp. moluccanus</i> (Rainbow Lorikeet)	Y		
152.	24808 <i>Tringa nebularia</i> (Common Greenshank)		IA	
153.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
154.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			

## Fish

155.	<i>Acentrogobius bifrenatus</i>			
156.	<i>Aetapcus maculatus</i>			
157.	<i>Aldrichetta forsteri</i>			
158.	<i>Anoplocapros lenticularis</i>			
159.	<i>Aracana aurita</i>			
160.	<i>Arenigobius bifrenatus</i>			
161.	<i>Arripis truttacea</i>			
162.	<i>Asymbolus submaculatus</i>			
163.	<i>Atherinosoma elongata</i>			
164.	<i>Aulohaalurus labiosus</i>			
165.	<i>Auxis thazard</i>			
166.	<i>Carcharhinus sp.</i>			
167.	<i>Chelidonichthys kumu</i>			
168.	<i>Cleidopus gloriamaris</i>			
169.	<i>Dactylophora nigricans</i>			
170.	<i>Diodon nichthemerus</i>			
171.	<i>Diodon sp.</i>			
172.	<i>Echeneis naucrates</i>			
173.	<i>Eubalichthys sp.</i>			
174.	<i>Euleptorhamphus viridis</i>			
175.	<i>Furgaleus macki</i>			
176.	<i>Galeorhinus galeus</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
177.	34030 <i>Geotria australis</i> (Pouched Lamprey)		P1	
178.	<i>Gonorynchus greyi</i>			
179.	<i>Gymnapistes marmoratus</i>			
180.	<i>Hemipristis elongata</i>			
181.	<i>Heterodontus portusjacksoni</i>			
182.	<i>Hippocampus</i> sp.			
183.	<i>Hyperlophus vittatus</i>			
184.	<i>Hyporhamphus melanocheir</i>			
185.	<i>Ichthyoscopus barbatus</i>			
186.	<i>Lagocephalus sceleratus</i>			
187.	<i>Makaira indica</i>			
188.	<i>Mugil cephalus</i>			
189.	<i>Myliobatis</i> sp.			
190.	<i>Nelusetta ayraudi</i>			
191.	<i>Omegophora armilla</i>			
192.	<i>Ophisurus serpens</i>			
193.	<i>Ophthalmolepis lineolatus</i>			
194.	<i>Parazanclistius hutchinsi</i>			
195.	<i>Phyllopteryx taeniolatus</i>			
196.	<i>Platycephalus speculator</i>			
197.	<i>Prionace glauca</i>			
198.	<i>Pristiophorus nudipinnis</i>			
199.	<i>Pseudogobius olorum</i>			
200.	<i>Pterygotrigla polyommata</i>			
201.	<i>Scomber australasicus</i>			
202.	<i>Sillago fraseri</i> (invalid)			Y
203.	<i>Sphyræna obtusata</i>			
204.	<i>Squalus megalops</i>			
205.	<i>Squatina australis</i>			
206.	<i>Stigmatopora argus</i>			
207.	<i>Thyrsites atun</i>			
208.	<i>Trachinotus baillonii</i>			
209.	<i>Trachurus novaezelandiae</i>			
210.	<i>Trichiurus lepturus</i>			
211.	<i>Trichiurus</i> sp.			
212.	<i>Trygonoptera mucosa</i>			
213.	<i>Urolophus</i> sp.			

**Invertebrate**

214.	<i>Aganippe raphiduca</i>			
215.	<i>Allothereua maculata</i>			
216.	<i>Aname mainae</i>			
217.	<i>Aname tepperi</i>			
218.	<i>Argiope protensa</i>			
219.	<i>Arkys walckenaeri</i>			
220.	<i>Artoriopsis exposita</i>			
221.	<i>Austracantha minax</i>			
222.	<i>Backobourkia brounii</i>			
223.	<i>Backobourkia heroine</i>			
224.	<i>Baiami volucripes</i>			
225.	<i>Celaenia excavata</i>			
226.	<i>Cercophonius sulcatus</i>			
227.	<i>Cormocephalus hartmeyerii</i>			
228.	<i>Cryptoerithus quobba</i>			
229.	<i>Cyclosa trilobata</i>			
230.	<i>Dingosa serrata</i>			
231.	<i>Erigone prominens</i>			
232.	<i>Eriophora biapicata</i>			
233.	<i>Isopeda leishmanni</i>			
234.	<i>Lampona cylindrata</i>			
235.	<i>Lampona punctigera</i>			
236.	<i>Latrodectus hasseltii</i>			
237.	<i>Missulena granulosa</i>			
238.	<i>Missulena hoggi</i>			
239.	<i>Missulena occatoria</i>			
240.	<i>Mituliodon tarantulinus</i>			
241.	<i>Mitzoruga insularis</i>			
242.	<i>Nephila edulis</i>			
243.	<i>Nicodamus mainae</i>			
244.	<i>Nunciella aspera</i>			
245.	<i>Pholcus phalangioides</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
246.	<i>Platorish gelorup</i>			
247.	<i>Steatoda capensis</i>			
248.	<i>Steatoda grossa</i>			
249.	<i>Synsphyronus magnus</i>			
250.	<i>Tamopsis distinguenda</i>			
251.	<i>Tasmanicosa leuckartii</i>			
252.	<i>Venator immansueta</i>			
253.	<i>Venatrix pullastra</i>			

**Mammal**

254.	24209	<i>Arctocephalus tropicalis</i> (Subantarctic fur-seal)		T
255.	24215	<i>Hydromys chrysogaster</i> (Water-rat, Rakali)		P4
256.	25478	<i>Isoodon obesulus</i> (Southern Brown Bandicoot)		P4
257.	24153	<i>Isoodon obesulus subsp. fusciventer</i> (Quenda, Southern Brown Bandicoot)		P4
258.		<i>Lobodon carcinophaga</i>		
259.	24132	<i>Macropus fuliginosus</i> (Western Grey Kangaroo)		
260.	24133	<i>Macropus irma</i> (Western Brush Wallaby)		P4
261.	24051	<i>Megaptera novaeangliae</i> (Humpback Whale)		S
262.	24076	<i>Mesoplodon bowdoini</i> (Andrew's Beaked Whale)		
263.	24078	<i>Mesoplodon grayi</i> (Gray's Beaked Whale)		
264.	24166	<i>Pseudocheirus occidentalis</i> (Western Ringtail Possum)		T
265.	24243	<i>Rattus fuscipes</i> (Western Bush Rat)		
266.	24245	<i>Rattus rattus</i> (Black Rat)	Y	
267.	48113	<i>Stenella coeruleoalba</i> (Striped Dolphin)		
268.	24259	<i>Sus scrofa</i> (Pig)	Y	
269.	25521	<i>Trichosurus vulpecula</i> (Common Brushtail Possum)		
270.	30954	<i>Tursiops aduncus</i> (Indo-Pacific Bottlenose Dolphin)		

**Reptile**

271.	42368	<i>Acritoscincus trilineatus</i> (Western Three-lined Skink)		
272.	25335	<i>Caretta caretta</i> (Loggerhead Turtle)		T
273.	24980	<i>Christinus marmoratus</i> (Marbled Gecko)		
274.	30893	<i>Cryptoblepharus buchananii</i>		
275.	25027	<i>Ctenotus australis</i>		
276.	25049	<i>Ctenotus labillardieri</i>		
277.	25096	<i>Egernia kingii</i> (King's Skink)		
278.	30919	<i>Hemiergis gracilipes</i>		
279.	25119	<i>Hemiergis quadrilineata</i>		
280.	43384	<i>Hydrophis platurus</i> (Yellow-bellied Seasnake)		
281.	25131	<i>Lerista distinguenda</i>		
282.	25133	<i>Lerista elegans</i>		
283.	25005	<i>Lialis burtonis</i>		
284.	25184	<i>Menetia greyii</i>		
285.	25191	<i>Morethia lineocellata</i>		
286.	25344	<i>Natator depressus</i> (Flatback Turtle)		T
287.	25252	<i>Notechis scutatus</i> (Tiger Snake)		
288.	25510	<i>Pogona minor</i> (Dwarf Bearded Dragon)		
289.	24907	<i>Pogona minor subsp. minor</i> (Dwarf Bearded Dragon)		
290.	25519	<i>Tiliqua rugosa</i>		

**Conservation Codes**

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

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



# EPBC Act Protected Matters Report

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

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

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

Report created: 04/06/17 14:24:40

[Summary](#)

[Details](#)

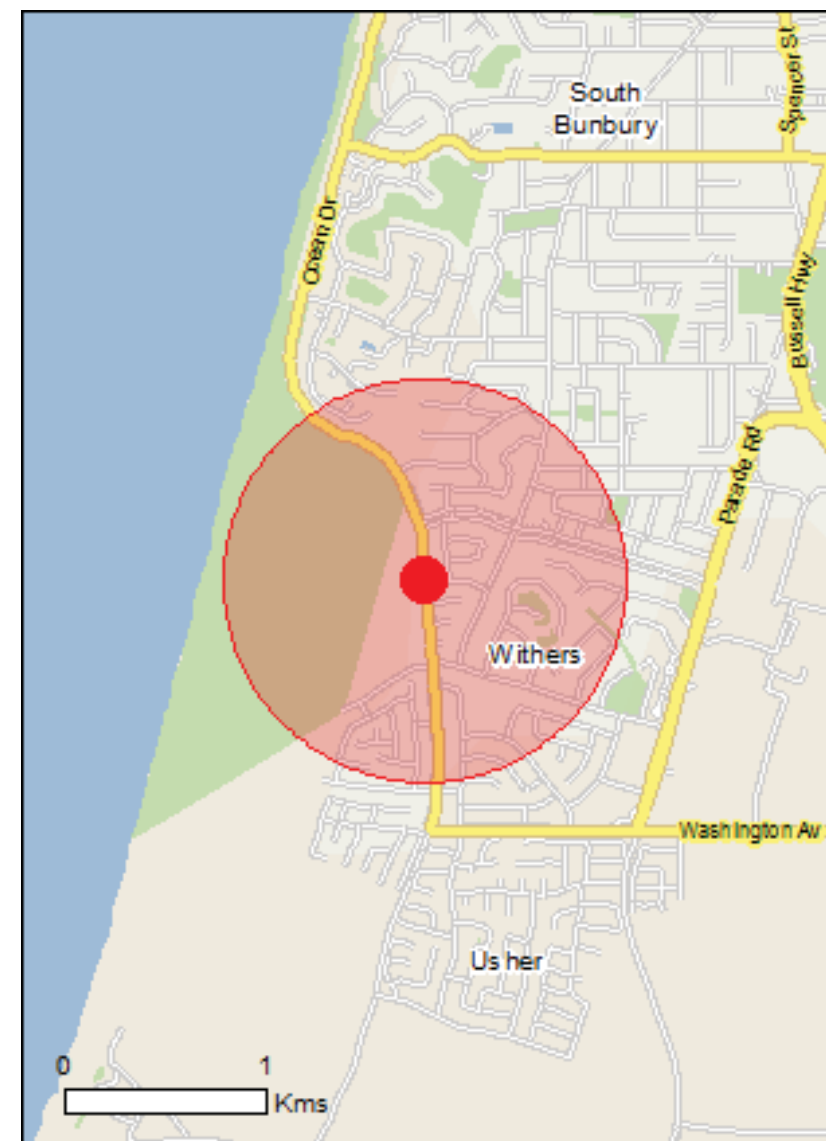
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

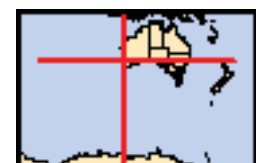
[Acknowledgements](#)



This map may contain data which are  
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[Coordinates](#)

Buffer: 1.0Km



# Summary

## Matters of National Environmental Significance

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

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	1
<a href="#">Listed Threatened Species:</a>	43
<a href="#">Listed Migratory Species:</a>	36

## Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	62
<a href="#">Whales and Other Cetaceans:</a>	13
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Commonwealth Reserves Marine:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	None
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	29
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None



# Details

## Matters of National Environmental Significance

### Listed Threatened Ecological Communities

[ [Resource Information](#) ]

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

Name	Status	Type of Presence
<a href="#">Banksia Woodlands of the Swan Coastal Plain ecological community</a>	Endangered	Community may occur within area

### Listed Threatened Species

[ [Resource Information](#) ]

Name	Status	Type of Presence
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#### Birds

<a href="#">Anous tenuirostris melanops</a> Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
<a href="#">Botaurus poiciloptilus</a> Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Calyptorhynchus baudinii</a> Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Vulnerable	Breeding known to occur within area
<a href="#">Calyptorhynchus latirostris</a> Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area



Name	Status	Type of Presence
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Limosa lapponica baueri</a> Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Limosa lapponica menzbieri</a> Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pachyptila turtur subantarctica</a> Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
<a href="#">Thalassarche cauta cauta</a> Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche cauta steadi</a> White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Breeding known to occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
<a href="#">Neophoca cinerea</a> Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat may occur within area
<a href="#">Pseudocheirus occidentalis</a> Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
<a href="#">Setonix brachyurus</a> Quokka [229]	Vulnerable	Species or species habitat may occur within area
<b>Plants</b>		
<a href="#">Andersonia gracilis</a> Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
<a href="#">Caladenia huegelii</a> King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area
<a href="#">Diuris micrantha</a> Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Diuris purdiei</a> Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area
<a href="#">Drakaea micrantha</a> Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Lambertia echinata subsp. occidentalis</a> Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat may occur within area
<b>Reptiles</b>		
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
<b>Sharks</b>		
<a href="#">Carcharias taurus (west coast population)</a> Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
<b>Listed Migratory Species</b>		<b>[ Resource Information ]</b>
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardenna carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Hydroprogne caspia</a> Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Onychoprion anaethetus</a> Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche cauta</a> Tasmanian Shy Albatross [89224]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<b>Migratory Marine Species</b>		
<a href="#">Balaena glacialis australis</a> Southern Right Whale [75529]	Endangered*	Breeding known to occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Caperea marginata</a> Pygmy Right Whale [39]		Species or species habitat may occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Lagenorhynchus obscurus</a> Dusky Dolphin [43]		Species or species habitat may occur within area
<a href="#">Manta alfredi</a> Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
<a href="#">Manta birostris</a> Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat may occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area



## Other Matters Protected by the EPBC Act

Listed Marine Species		[ Resource Information ]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Anous tenuirostris melanops</a> Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Breeding known to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area



Name	Threatened	Type of Presence
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pachyptila turtur</a> Fairy Prion [1066]		Species or species habitat likely to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat may occur within area
<a href="#">Puffinus assimilis</a> Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area
<a href="#">Puffinus carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
<a href="#">Sterna anaethetus</a> Bridled Tern [814]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Sterna caspia</a> Caspian Tern [59467]		Foraging, feeding or related behaviour known to occur within area
<a href="#">Thalassarche cauta</a> Tasmanian Shy Albatross [89224]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area
<b>Fish</b>		
<a href="#">Acentronura australe</a> Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
<a href="#">Campichthys galei</a> Gale's Pipefish [66191]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Heraldia nocturna</a> Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
<a href="#">Hippocampus angustus</a> Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
<a href="#">Hippocampus breviceps</a> Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
<a href="#">Hippocampus subelongatus</a> West Australian Seahorse [66722]		Species or species habitat may occur within area
<a href="#">Histiogamphelus cristatus</a> Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
<a href="#">Lissocampus caudalis</a> Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
<a href="#">Lissocampus fatiloquus</a> Prophet's Pipefish [66250]		Species or species habitat may occur within area
<a href="#">Lissocampus runa</a> Javelin Pipefish [66251]		Species or species habitat may occur within area
<a href="#">Maroubra perserrata</a> Sawtooth Pipefish [66252]		Species or species habitat may occur within area
<a href="#">Mitotichthys meraculus</a> Western Crested Pipefish [66259]		Species or species habitat may occur within area
<a href="#">Nannocampus subosseus</a> Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area
<a href="#">Phycodurus eques</a> Leafy Seadragon [66267]		Species or species habitat may occur within area
<a href="#">Phyllopteryx taeniolatus</a> Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
<a href="#">Pugnaso curtirostris</a> Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
<a href="#">Solegnathus lettiensis</a> Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
<a href="#">Stigmatopora argus</a> Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
<a href="#">Stigmatopora nigra</a> Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
<a href="#">Stigmatopora olivacea</a> a pipefish [74966]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Urocampus carinirostris</a> Hairy Pipefish [66282]		Species or species habitat may occur within area
<a href="#">Vanacampus margaritifer</a> Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
<a href="#">Vanacampus phillipi</a> Port Phillip Pipefish [66284]		Species or species habitat may occur within area
<a href="#">Vanacampus poecilolaemus</a> Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

### Mammals

<a href="#">Arctocephalus forsteri</a> Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
<a href="#">Neophoca cinerea</a> Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat may occur within area

### Reptiles

<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area

### Whales and other Cetaceans

[ [Resource Information](#) ]

Name	Status	Type of Presence
<b>Mammals</b>		
<a href="#">Balaenoptera acutorostrata</a> Minke Whale [33]		Species or species habitat may occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Caperea marginata</a> Pygmy Right Whale [39]		Species or species habitat may occur within area
<a href="#">Delphinus delphis</a> Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Breeding known to occur within area
<a href="#">Grampus griseus</a> Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
<a href="#">Lagenorhynchus obscurus</a> Dusky Dolphin [43]		Species or species habitat may occur within

Name	Status	Type of Presence area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Stenella attenuata</a> Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
<a href="#">Tursiops aduncus</a> Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
<a href="#">Tursiops truncatus s. str.</a> Bottlenose Dolphin [68417]		Species or species habitat may occur within area

## Extra Information

### 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
<b>Birds</b>		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
<b>Mammals</b>		
Canis lupus familiaris Domestic Dog [82654]		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
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
<b>Plants</b>		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Asparagus declinatus Bridal Veil, Bridal Veil Creeper, Pale Berry Asparagus Fern, Asparagus Fern, South African Creeper [66908]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area

Name	Status	Type of Presence
Protasparagus plumosus Climbing Asparagus-fern, Ferny Asparagus [11747]		Species or species habitat likely to occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area

# 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

-33.36531 115.62497



# Acknowledgements

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

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

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

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

# **APPENDIX D**

## **BLACK COCKATOO HABITAT TREE DETAILS**

Habitat Trees (DBH  $\geq$  50cm)

Datum - GDA94

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Potential Cockatoo Nest Hollow	Comments
wpt001	50H	371984	6307721	Tuart	20+	>50	0	No	Just outside works footprint
wpt002	50H	371994	6307719	Tuart	20+	>50	0	No	
wpt003	50H	372071	6307397	Tuart	20+	>50	0	No	Just outside works footprint

## **DISCLAIMER**

This fauna assessment report (“the report”) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Greg Harewood (“the Author”). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints. In accordance with the scope of services, the Author has relied upon the data and has conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

The conclusions are based upon field data and the environmental monitoring and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of preparing the report. Also it should be recognised that site conditions, can change with time.

Within the limitations imposed by the scope of services, the field assessment and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

In preparing the report, the Author has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report (“the data”). Except as otherwise stated in the report, the Author has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (“conclusions”) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. The Author will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to the Author.

The report has been prepared for the benefit of the Client and no other party. The Author assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of the Author or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

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