

# Fauna Assessment

(CPS 8689/1)



## Harris Road

(SLK 0.00 to SLK 1.65)

## Picton East

NOVEMBER 2019

*Version 1*

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**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 DBCA), WA Government.

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

**CBD:** Central Business District.

**DBCA:** Department of Biodiversity, Conservation and Attractions (formerly DPaW, DEC, CALM, DoE), WA Government

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

**DEC:** Department of Environment and Conservation (now DBCA), 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 (now DWER), 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/DBCA), WA Government.

**DoP:** Department of Planning, WA Government.

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

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

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

**DoW:** Department of Water (now DWER), WA Government.

**DPaW:** Department of Parks and Wildlife (now DBCA), WA Government.

**DWER:** Department of Water and Environmental Regulation (formed by the amalgamation of OEPA, DoW and DER), 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.

**m:** Metre.

**mm:** Millimetre.

**P:** Priority - DBCA fauna conservation ranking.

**POS:** Public Open Space.

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

**S:** Schedule - Western Australian *Wildlife Conservation Act (1950)* Threatened Fauna Category.

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

**SRE:** Short Range Endemic.

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

**WA:** Western Australia.

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

**WAPC:** Western Australian Planning Commission, 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 ~1.65 km section of Harris Road, Picton East (the subject site) (Figure 1). The Shire of Dardanup (the Shire) is proposing to clear up to 0.089 ha of vegetation from within the subject site for the purpose of road widening/upgrades and have applied to the DWER for a clearing permit (CPS 8689/1) pursuant to Section 51E of the *Environmental Protection Act 1986* (Figures 2 to 6).

The main aim of the fauna assessment reported on here is to provide information on the fauna values of the subject site so that management measures can be employed to minimise impacts on fauna which may result during clearing operations and subsequent road construction.

Day time field survey work at the site was carried out on the 5 and 23 November 2019. Two night time surveys were undertaken, the first on 18 November 2019 and the second on the 20 November 2019. All survey work was carried out by Greg Harewood (Zoologist).

### Key Findings

- With respect to native vertebrate fauna, 13 mammal (including nine bat species), 75 bird, 13 reptile and eight frog species have previously been recorded in the wider area, some of which have the potential to occur in or utilise sections of the subject site at times. Eight species of introduced animals could also frequent the area.
- Of the 108 native vertebrate animals that are listed as potentially occurring, five are considered to be threatened/in need of special protection under State and/or Federal law (peregrine falcon, Carnaby's black cockatoo, Baudin's black cockatoo, forest red-tailed black cockatoo and the western ringtail possum). In addition, one DBCA priority species is also listed as potentially occurring (western false pipistrelle). These particular species are discussed in further detail in the following sections of the report.
- The subject site shows significant signs of historical disturbance with the remnant vegetation being highly fragmented and degraded. The vegetation is now comprised of small groves or isolated trees dominated by various species such as marri (*Corymbia calophylla*), jarrah (*Eucalyptus marginata*), flooded gum (*E. rudis*), peppermint (*Agonis flexuosa*) and paperbark (*Melaleuca raphiophylla* or *M. preissiana*) generally over a grassland of introduced weeds.
- Overall fauna biodiversity with the subject site is anticipated to be very low when compared to original levels given that most of the area is already cleared with the remnant vegetation that does remain being highly fragmented and degraded. Despite this reduce biodiversity the vegetation

still has the capacity to support some species including a number of conservation significant fauna.

- The black cockatoo assessment identified 43 habitat trees within or near the subject site however none contain hollows or possible hollows potentially suitable for black cockatoos to use for nesting purposes. A small amount of black cockatoo foraging evidence was observed (chewed marri fruits). No evidence of roosting activity was recorded. Only a small area of black cockatoo habitat falls within or near the proposed clearing areas and therefore impacts are anticipated to be negligible.
- Targeted surveys for the western ringtail possum identified the presence of a small number of individuals in one area, though they have the potential to be present in other areas if only infrequently.
- Most other conservation significant species known from the region are unlikely to be impacted on by the proposal due to the fact that the subject site does not contain their preferred habitat and therefore they are unlikely to be present. In cases where some habitat is present, likely impacts are anticipated to be low given the small area of clearing required and the fact that the clearing footprint is narrow and spread over a ~1.65 km length of road.
- A number of other recommendations aimed at mitigating and minimising potential impacts on fauna and fauna habitat in general are provided in Section 8. These should be implemented by the proponent as part of existing or proposed management plans where considered reasonable and practicable.
- If granted, it is recommended that DWER include a condition in the clearing permit requiring a “fauna specialist” to inspect vegetation for the presence of western ringtail possums (and other fauna) immediately prior to clearing.



## 1. INTRODUCTION

This report details the results of a fauna assessment of a ~1.65 km section of Harris Road, Picton East (the subject site) (Figure 1). The Shire of Dardanup (the Shire) is proposing to clear up to 0.089 ha of vegetation from within the subject site for the purpose of road widening/upgrades and have applied to the DWER for a clearing permit (CPS 8689/1) pursuant to Section 51E of the *Environmental Protection Act 1986* (Figures 2 to 6).

The main aim of the fauna assessment reported on here is to provide information on the fauna values of the subject site so that management measures can be employed to minimise impacts on fauna which may result during clearing operations and subsequent road construction.

It is also anticipated that the information presented here will be used by DWER to assess the potential impact of the proposal on fauna and fauna habitats within and near the subject site during the approval process.

It should be noted that a desktop review of environmental factors related to the subject site has previously been prepared by Accendo Australia (2019). This document provides information regarding the current environmental condition of the clearing area, including the predicted fauna related impacts of clearing in addition to providing some recommended management actions. The fauna assessment detailed below has been undertaken to provide more site specific information related to the proposal.

## 2. SCOPE OF WORKS

The scope of works is to conduct a level 1 fauna survey as defined by the EPA (EPA 2016). Because the general area is known to be utilised by black cockatoos and western ringtail possums the scope of the survey work has been expanded to include a Level 2 (EPA 2016) assessment of the site's significance to these species as well. The fauna assessment has therefore included:

1. Level 1 fauna assessment (in accordance with EPA (2016) guidelines);
2. Targeted searches for black cockatoo habitat/site use (habitat trees, existing and potential nest hollows, foraging and roosting habitat);
3. Targeted day and night searches for western ringtail possum habitat/site use (foraging, refuge and dispersal habitat and individuals);
4. Report summarising results with management/planning recommendations.

Note: For the purposes of this proposal 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*.

## **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 conservation significant fauna potentially occurring within the subject site:

- DBCA's NatureMap Database Search (combined data from DBCA, ALA, WAM, BA and consultant's reports) (DBCA 2019b); and
- Protected Matters Search Tool (DotEE 2019).

It should be noted that lists produced during the abovementioned database searches contain observations/inferred distributions from a broader area than the subject site 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 subject site itself. The databases also often include or are based on very old records and in some cases the species in question have become locally or regionally extinct.

Information from these sources should therefore be taken as indicative only and local knowledge and information also needs to be taken into consideration when determining what actual species may be present within the specific area being investigated.

#### **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 publicly available and could not be referenced. The most significant of those available have been used as the primary reference material for compiling a list of fauna species of conservation significance most likely to occur in the general area.

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

- Coffey (2008). Doral Mineral Sands Western Expansion. Level 1 Fauna Assessment. Unpublished Report for Doral Mineral Sands Pty Ltd.
- Coffey (2011a). Baseline Aquatic Fauna Assessment and Water Quality Study. Southern Extension of the Dardanup Mineral Sands Project. Unpublished Report for Doral Mineral Sands Pty Ltd.
- Coffey (2011b). Level 1 Fauna Assessment. Southern Extension of the Dardanup Mineral Sands Project. Unpublished Report for Doral Mineral Sands Pty Ltd.
- ENV Australia (2004). North Boyanup District Structure Plan. Unpublished report for the DPI. (Level 1 fauna survey results).

- ENV Australia (2008). Edith Cowan University, South West Campus. Fauna Assessment (Level 2). Unpublished report for ECU.
- Environmental Protection Authority (EPA) (2008). Advice on areas of conservation significance in the Preston Industrial Park. Bulletin 1282, March 2008.
- 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.
- Harewood, G. (2009a). Fauna Assessment (Level 1) Lot 200 (part), Harris Road, Picton. Unpublished report for MBS Environmental.
- Harewood, G. (2009b). Terrestrial Fauna Survey (Level 1) Lots 1, 2, 11, 102-104 & 603, Picton East. Unpublished report for Strategen.
- Harewood, G. (2010a). Fauna Survey (Level 1) Lot 5 Garvey Road, Dardanup West. Unpublished report for Ecoedge Environmental.
- Harewood, G. (2010b). Fauna Survey (Level 2). Kemerton Industrial Core. Unpublished report for Cardno (WA) Pty Ltd.
- Harewood, G. (2012a). Fauna Assessment of Lot 520 Boyanup Picton Road, Picton. Unpublished report for Strategen.
- Harewood, G. (2012b). Fauna Assessment of Lot 2, Temple Road, Picton East. Unpublished report for Ecoedge Environmental.
- Harewood, G. (2012c). Fauna Assessment of Lot 110 Simpson Road, Dardanup. Unpublished report for Doral Mineral Sands Pty Ltd.
- Harewood, G. (2012d). Western Ringtail Possum & Black Cockatoo Pre-Clearance Survey of the Doral Southern Extension, Dardanup. Unpublished report for Doral Mineral Sands Pty Ltd.
- Harewood, G. (2013). Fauna Assessment of Harris Road, (Martin Pelusey Road to Waterloo Road), Dardanup. Unpublished report for the Shire of Dardanup c/- Ecoedge.
- Ninnox Wildlife Consulting (Ninnox) (2006). A Vertebrate Fauna Assessment of the Burekup Mineral Sands Project Area. Unpublished Report for Iluka Resources Ltd.

As with the databases searches some reports refer to species that would not occur in the subject site 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 subject site:

- 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.
- 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. (2017). 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:

- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. Administered by the Australian Government DoEE;
- *Biodiversity Conservation Act 2016 (BC Act)*. Administered by the Western Australian DBCA (Govt. of WA 2018). Note: The Wildlife Conservation (Specially Protected Fauna) Notice 2018 has been transitioned under regulations 170, 171 and 172 of the Biodiversity Conservation Regulations 2018 to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the *BC Act*;
- Red List produced by the 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
- DBCA Priority Fauna list. A non-statutory list maintained by the DBCA for management purposes (DBCA 2019a).

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 – Some but not all species listed under JAMBA are also protected under Schedule 5 of the BC Act.).

Most, but not all migratory bird species listed in the annexes to these bilateral agreements are also 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 subject site 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.

### **3.1.5 Taxonomy and Nomenclature**

Taxonomy and nomenclature for vertebrate fauna species used in this report is generally taken from the DBCA'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 (2017), Van Dyck & Strahan (2013), Christidis and Boles (2008), Bush *et al.* (2010), Bush *et al.* (2007), Tyler & Doughty (2009), and Glauret (1961). Not all common names are generally accepted.

### **3.1.6 Likelihood of Occurrence – 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 subject site itself. The rankings and criteria used were:

- Would Not Occur: There is no suitable habitat for the species in the subject site 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 20 km of the subject site. 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 swan coastal plain region. Populations do however persist outside of this area.
- Unlikely to Occur: The subject site 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 subject site itself would not support individuals or a population the species.

- Possibly Occurs: The subject site 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 subject site. 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 subject site 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.

## **3.2 SITE SURVEYS**

Day time field survey work at the site was carried out on the 5 and 23 November 2019. Two night time surveys were undertaken, the first on 18 November 2019 and the second on the 20 November 2019. All survey work was carried out by Greg Harewood (Zoologist).

### **3.2.1 Fauna Habitat Assessment**

Vegetation units recorded within the subject site have been used to define broad fauna habitat types present.

The main aim of the habitat assessment was to determine if it was likely that any species of conservation significance would be utilising the areas that maybe impacted on as a consequence of development at the site. The habitat information obtained was also used to aid in finalising the overall potential fauna list.

As part of the desktop 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 subject site were assessed and specific elements identified, if present, to determine the likelihood of listed threatened species utilising the area and its significance to them.



### 3.2.2 Black Cockatoo Habitat Assessment

The following methods were employed during the black cockatoo habitat assessment to comply with the defined scope of works and are based on guidelines published by the DotEE (Commonwealth of Australia 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 (Commonwealth of Australia 2012) these being:

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

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

#### 3.2.2.1 Black Cockatoo Breeding Habitat

The black cockatoo breeding habitat assessment involved the identification of all suitable breeding trees species (native, endemic species only) within or near the subject site that had a DBH of equal to or over 50cm. The DBH of each tree was estimated using a pre-made 50 cm "caliper". All trees within the road reserve between SLK 0.00 and SLK 1.65 were assessed not just those within the subject site/clearing permit area.

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.

Potential hollows were placed into one of four categories, based on the size of the apparent hollow entrance, these being:

- Small = ~<5cm diameter (i.e. entrance too small for a black cockatoo);
- Medium = ~5cm-10cm diameter (i.e. entrance too small for a black cockatoo);
- Large = ~>10cm diameter (entrance large enough for a black cockatoo but possible hollow appears to be unsuitable for nesting i.e. wrong orientation, too small, too low or too shallow); or
- Large (cockatoo) = ~>10cm diameter (entrance appears big enough to provide access to a possible hollow that may be suitable for a black cockatoo to use for nesting).

Based on this assessment trees present within the subject site have been placed into one of four categories:

- Tree < 50cm DBH or an unsuitable species (not recorded);
- Tree  $\geq$ 50cm DBH, no hollows seen;
- Tree  $\geq$ 50cm DBH, one or more hollows seen, none of which were considered suitable for black cockatoos to use for nesting; or
- Tree  $\geq$ 50cm 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) or possible hollows considered potentially 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”.*

Identified hollows were examined using binoculars for evidence of actual use by black cockatoos (e.g. chewing around hollow entrance, scarring and scratch marks on trunks and branches). Trees with possible nest hollows were also scratched and raked with a large stick/pole in attempt to flush any sitting birds from hollows and calls of chicks were also listened for. It should be noted that the survey may have been conducted outside of the main breeding season of one or more of the three species of black cockatoo.

### **3.2.2.2 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.

### **3.2.2.3 Black Cockatoo Roosting Habitat**

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

## **3.2.3 Western Ringtail Possum Assessment**

### **3.2.3.1 Daytime Survey**

A day time survey to locate and record dreys, obvious tree hollows, scats and individual WRPs was carried out concurrent with the black cockatoo habitat assessment and involved a series of close spaced traverses on foot across the subject site.

### **3.2.3.2 Night Time Survey**

Two night time surveys to locate and record individual WRPs were carried out. These involved a series of transect across the subject site, on foot using a LED head torch.

### **3.2.3.3 Habitat Assessment**

Description and comments on the amount and quality of WRP habitat within the subject site are provided based on observations made during the site surveys.

## **3.2.4 Other Fauna Species of Conservation Significance**

Evidence of the presence or likely presence of other fauna species of conservation significance (or suitable habitat) was searched for and recorded concurrent with other site surveys. The aim was to obtain enough information to make a definitive comment on the likely significance of the subject site to other fauna species of conservation significance.

Methods involved searching microhabitats such as logs, rocks, leaf litter and observations with binoculars. Secondary evidence of a species presence such as tracks, scats, skeletal remains, foraging evidence or calls were also noted if observed/heard.

## **3.2.5 Opportunistic Fauna Observations**

Opportunistic observations of fauna species were made during all field survey work and recorded where positive species identifications were made.

## **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 site 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 based on there being suitable habitat (quality and extent) within the subject site 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 site or does not utilise it for some purpose at times.

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 an apparent lack of a specific habitat or microhabitat within the subject site. As a consequence of this limitation the potential fauna list produced is most likely an overestimation of those species that actually utilise the subject site for some purpose. Some species may be present in the general area but may only use the subject site 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 subject site (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 subject site.

During the black cockatoo habitat survey trees with hollows were searched for. 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.

## 5. RESULTS

### 5.1 POTENTIAL FAUNA INVENTORY – LITERATURE REVIEW

A list of vertebrate fauna species considered most likely to occur in the subject site 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 listing as are the DBCA NatureMap database search results (with species considered unlikely to occur being omitted). The raw database search results from NatureMap (DBCA 2019b) and the Protected Matters Search Tool (DotEE 2019) are contained within Appendix C.

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 or immediately adjoining the subject site, though compiling an accurate list has limitations (see Section 4 above) and therefore as discussed, the listing is very likely to be an overestimation of the fauna species actually present onsite at any one time.

With respect to native vertebrate fauna, 13 mammal (including nine bat species), 75 bird, 13 reptile and eight frog species have previously been recorded in the wider area, some of which have the potential to occur in or utilise sections of the subject site at times. Eight species of introduced animals could also frequent the area.

Of the 108 native vertebrate animals that are listed as potentially occurring, five are considered to be threatened/in need of special protection under State and/or Federal law (peregrine falcon, Carnaby's black cockatoo, Baudin's black cockatoo, forest red-tailed black cockatoo and the western ringtail possum). In addition, one DBCA priority species is also listed as potentially occurring (western false pipistrelle). These particular species are discussed in further detail in the following sections of the report.

### 5.2 SITE SURVEYS

#### 5.2.1 Fauna Habitat Assessment


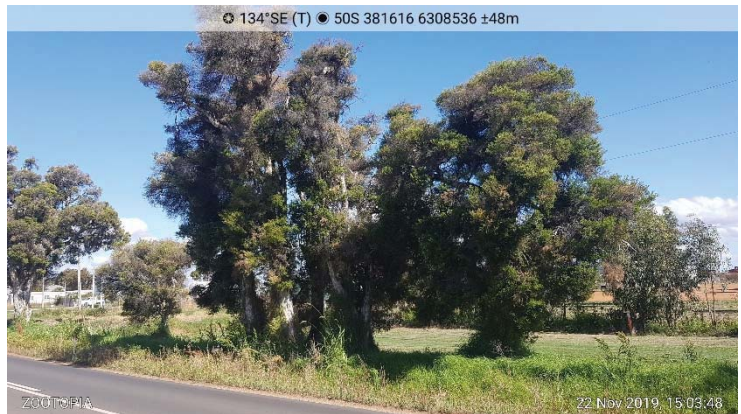

Examples images of the fauna habitats/dominant vegetation types present within proposed clearing areas (CPS 8689/1) are provided in Table 1 and their location shown in Figures 2 to 6.

The subject site shows significant signs of historical disturbance with the remnant vegetation being highly fragmented and degraded. The vegetation is now comprised of small groves or isolated trees dominated by various species such as marri (*Corymbia calophylla*), jarrah (*Eucalyptus marginata*), flooded gum (*E. rudis*), peppermint (*Agonis flexuosa*) and paperbark (*Melaleuca raphiophylla* or *M. preissiana*) generally over a grassland of introduced weeds.







Overall fauna biodiversity with the subject site is anticipated to be very low when compared to original levels given that most of the area is already cleared with the remnant vegetation that does remain being highly fragmented and degraded. Despite this reduce biodiversity the vegetation still has the capacity to support some species including a number of conservation significant fauna.

**Table 1: Example Images of the Fauna Habitats within Proposed Clearing Areas (CPS 8689/1)**

Fauna Habitat Description	Example Image
<p>Peppermint (<i>Agonis flexuosa</i>) low open forest with emergent marri (<i>Corymbia calophylla</i>) and Jarrah (<i>Eucalyptus marginata</i>) over a grassland of introduced weeds. (see Figure 6)</p>	 <p>79°E (T) ● 50S 381845 6308480 ±4m</p> <p>ZOOTOPIA 22 Nov 2019, 15:01:51</p>
<p>Paperbark (<i>Melaleuca raphiophylla</i> and/or <i>M. preissiana</i>) over a grassland of introduced weeds (see Figure 5).</p>	 <p>134°SE (T) ● 50S 381616 6308536 ±48m</p> <p>ZOOTOPIA 22 Nov 2019, 15:03:48</p>
<p>Paperbark (<i>Melaleuca raphiophylla</i> and/or <i>M. preissiana</i>) over a grassland of introduced weeds (see Figure 4).</p>	 <p>107°E (T) ● 50S 381464 6308544 ±2m</p> <p>ZOOTOPIA 22 Nov 2019, 15:05:56</p>



Fauna Habitat Description	Example Image
<p>Paperbark (<i>Melaleuca raphiophylla</i> and/or <i>M. preissiana</i>) and emergent marri (<i>Corymbia calophylla</i>) over a grassland of introduced weeds (see Figure 4).</p>	 <p>42°NE (T) ● 50S 381460 6308543 ±3m</p> <p>ZOOTOPIA 22 Nov 2019, 15:06:30</p>
<p>Marri (<i>Corymbia calophylla</i>) over a grassland of introduced weeds (see Figure 3).</p>	 <p>106°E (T) ● 50S 381131 6308554 ±6m</p> <p>ZOOTOPIA 22 Nov 2019, 15:13:47</p>
<p>Marri (<i>Corymbia calophylla</i>) woodland over a grassland of introduced weeds (see Figure 3).</p>	 <p>27°N (T) ● 50S 381094 6308536 ±3m</p> <p>ZOOTOPIA 22 Nov 2019, 15:14:47</p>
<p>Marri (<i>Corymbia calophylla</i>) (some dead) over a grassland of introduced weeds (see Figure 2).</p>	 <p>57°NE (T) ● 50S 380636 6308446 ±4m</p> <p>ZOOTOPIA 22 Nov 2019, 15:18:46</p>

## 5.2.2 Black Cockatoo Habitat Assessment

### 5.2.2.1 Black Cockatoo Habitat Tree Assessment

The assessment identified 43 trees within the area surveyed with a DBH of  $\geq 50$ cm. The majority (38, 88.4%) of the trees recorded were not observed to contain hollows of any size. The balance of trees (5) were assessed as possibly containing one or more hollows unsuitable for black cockatoos to use for nesting based on their apparent/likely small size, orientation and/or low height above ground level. No trees were observed to contain hollows that appeared suitable for black cockatoos.

Only three or four of these trees (none with hollows of any size) fall within or near the proposed clearing permit areas (Figure 7)

Additional details on each habitat tree observed can be found in Appendix D.

**Table 2: Summary of Habitat Trees (DBH  $\geq 50$ cm) within the Subject Site**

Total Number of Habitat Trees	Number of Trees with No Hollows 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	Tree Species		
				Marri	Jarrah	Flooded Gum
43	38	5	0	38	4	1

### 5.2.2.2 Black Cockatoo Foraging Habitat Assessment

Areas of vegetation containing marri and jarrah represent foraging habitat for black cockatoos. Foraging evidence attributed to the forest red-tailed black cockatoo was observed at one location (chewed marri fruits).

Black cockatoos have been documented as feeding on grubs (beetle larvae) extracted from under peppermint tree bark however this is a very infrequent occurrence and would represent only a very small fraction of any single birds' diet.

The total extent of quality foraging habitat that falls within the clearing permit areas is very small and is represented by a small number of marri trees.

### 5.2.2.3 Black Cockatoo Roosting Habitat Assessment

No evidence of black cockatoos roosting within the subject site was observed during the survey period.

## **5.2.3 Western Ringtail Possum Assessment**

### **5.2.3.1 Daytime Survey**

Two WRP drey were observed during the day survey within or very close to the subject site (Figure 8). Forks in trees, subtle cavities in tree trunks, fallen hollow logs, rabbit burrows and dense ground cover (e.g. swordgrass) are also use by WRPs for daytime refuge and therefore observations of dreys only provides a guide to WRP habitat use/quality as other opportunities for daytime refuge may exist.

No WRP scats were observed. Dense groundcover in most areas made searching for scats difficult and time consuming and therefore this method for determining WRP presence/absence was not employed extensively.

### **5.2.3.2 Night Time Survey**

Two WRPs were observed within the subject site during the first nocturnal survey. Two individuals (presumed to be the same individuals as night 1) were observed in similar locations on the second night survey (Figure 8).

### **5.2.3.3 Habitat Assessment**

The majority of the subject site is already cleared and therefore does not represent WRP habitat. The groves of trees, in particular those containing peppermint does however represent potential habitat of varying quality. The highly fragmented nature of the remnants does however lessen their overall value.

## **5.2.4 Other Fauna Species of Conservation Significance**

Besides the small amount of foraging evidence attributed to the forest red-tailed black cockatoo and the western ringtail possum, no other fauna species of conservation significance were recorded during the survey period.

The habitat assessment and other observations made during the survey period does however suggest that some fauna species of conservation significance are likely to persist in the general area. Subject to suitable habitat being present (i.e. quality and extent) it is considered possible that some are also likely to reside or at least frequent the subject site at times.

The extent of habitats within the subject site is however extremely small and therefore any fauna species actually present are only likely to be represented by a small number of individuals at any one time. A summary of those species considered likely to be present is provided in Table 4, within Section 6.

## **5.2.5 Opportunistic Fauna Observations**

Opportunistic fauna observations are listed in Appendix B. A total of 17 native fauna species were observed (or positively identified from foraging evidence,



scats, tracks, skeletons or calls) within the subject site during the day and night time surveys. Two introduced species was also recorded.

The limited number of fauna species observed can be attributed to the relatively short space of time spent on site (~3 hours), its small size and the limited number of the habitats present.

### 5.3 FAUNA INVENTORY – SUMMARY

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

**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>Observed:</u> Field Survey 2019
<b>Amphibians</b>	8	0	0	0	0
<b>Reptiles</b>	13	0	0	0	0
<b>Birds</b>	78 <sup>3</sup>	4	0	0	19 <sup>2</sup>
<b>Non-Volant Mammals</b>	8 <sup>5</sup>	1	0	0	0
<b>Volant Mammals (Bats)</b>	9	0	0	1	0
<b>Total</b>	<b>116<sup>8</sup></b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>19<sup>2</sup></b>

Superscript = number of introduced species included in total.

As previously indicated, not all species listed as potentially occurring within the wider area in existing databases and publications (i.e. *EPBC Act* threatened fauna and migratory species lists, DBCA's NatureMap database, various reports and publications) are shown in the expected listing held in Appendix B. Some species have been excluded from this list based largely on the lack of suitable habitat at the subject site and in the general area or known local/regional extinction even if suitable habitat appears to be 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 site (either on a regular or infrequent basis) as a result 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 subject site.

The following vertebrate fauna species of conservation significance were positively identified as utilising the subject site for some purpose during the survey period:

- *Calyptorhynchus banksii naso* Forest Red-tailed Black Cockatoo – S3 (BC Act), Vulnerable (EPBC Act)  
Small areas of favoured foraging habitat (i.e. marri and jarrah) present. Evidence of foraging attributed to this species observed in the form of chewed marri fruits. No existing nest hollows identified. No roosting sites identified.
- Western Ringtail Possum *Pseudocheirus occidentalis* – S1 (BC Act), Critically Endangered (EPBC Act)  
The field surveys confirmed the presence of this species within/adjacent to the subject.

Based on the habitats present and its current documented distribution it is considered possible that several additional species of conservation significance may use the subject site for some purpose at times, though, as no evidence of any was found at the time of the field survey, the status of some in the area remains uncertain.

These species are:

- *Calyptorhynchus latirostris* Carnaby's Black Cockatoo – S2 (BC Act), Endangered (EPBC Act)  
Not observed during the survey period but known to frequent the general area. Small areas of favoured foraging habitat (i.e. marri and jarrah) present. No existing nest hollows identified. No roosting sites identified
- *Calyptorhynchus baudinii* Baudin's Black Cockatoo – S2 (BC Act), Endangered (EPBC Act)  
Not observed during the survey period but known to frequent the general area. Small areas of favoured foraging habitat (i.e. marri and jarrah) present. No existing nest hollows identified. No roosting sites identified
- *Falco peregrinus* Peregrine Falcon – S7 (BC Act)  
This species potentially utilises some sections of the subject site as part of a much larger home range. No evidence of nesting seen and the probability of this species breeding within the subject site can be considered to be very low.
- *Falsistrellus mackenziei* Western False Pipistrelle - P4 (DBCA Priority Species)  
May utilise the site for foraging. Lack of hollow trees suggest it is unlikely to roost within the subject site.

As listed in Table 4 in the following section, a number of other species of conservation significance, while possibly present in the wider area are not considered as potential species due to known localised extinction (and no subsequent recruitment from adjoining areas), lack of suitable habitat and/or the presence of feral predators.

## 6. LIKELIHOOD OF OCCURRENCE AND POTENTIAL IMPACTS

Fauna of conservation significance identified during the literature review as previously being recorded in the general area are listed in Table 3. Each has been assessed and ranked for their likelihood of occurrence within the subject site itself based on information obtained during the fauna assessment.

The exact location and extent of any proposed development within the subject site is not yet defined and therefore it is not possible to quantify impacts. The potential direct and indirect impact on fauna that may occur as a consequence of clearing, construction and then ongoing use of the area will be dependent on each fauna species habits, population density and the quantity and quality of potential habitat that will be affected.

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, foxes);
- Death or injury of fauna during clearing and construction; and
- An increase in fauna road kills subsequent to development.

In this instance impacts are most likely to be related to the loss of habitat and the potential for some species to be killed or injured during clearing. Impacts on fauna species in general are unlikely to be significant given the small area of vegetation likely to be affected and the presence of significant areas of bushland nearby. Also the current value of the vegetation bordering the road as a “wildlife corridor” are unlikely to be significantly compromised given the vegetation is already highly fragmented and the extent of proposed clearing is small.

Overall impacts on fauna and in particular those species of conservation significance can be considered to be low, primarily because of the relatively small area of clearing likely to be required, the fact that clearing will be scattered over a distance of about ~1.65 km and because of the poor quality of the habitat present.

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

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Possible Impacts
	BC Act/ DBCA Priority	EPBC Act				
Pouched Lamprey <i>Geotria australis</i>	P3	-	This species lives in mud burrows in the upper reaches of coastal streams for the first 4 years of life until migrating to the sea. Adults migrate up to 60km upstream during spawning.	No	Would Not Occur.	None Identified/Negligible
Carter's Freshwater Mussel <i>Westralunio carteri</i>	S3	VU	Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots.	No	Would Not Occur.	None Identified/Negligible
Western Pygmy Trapdoor Spider <i>Bertmainius opimus</i>	P3	-	Found in mesic habitats. The species makes shallow burrows in the bark of trees and in the mossy banks of creeks.	No	Would Not Occur.	None Identified/Negligible
Swan Coastal Plain Shield-backed Trapdoor Spider <i>Idiosoma sigillatum</i>	P3	-	Burrows of this species usually found in Banksia woodland and heathland on sandy soils.	No	Would Not Occur.	None Identified/Negligible
Balston's Pygmy Perch <i>Nannatherina balstoni</i>	S3	VU	Acidic, tannin stained freshwater pools, streams and lakes within 30km of the coast, typically situated amongst peat flats. Prefers shallow water and is commonly found in association with tall sedge thickets.	No	Would Not Occur.	None Identified/Negligible
Coastal Plains Skink <i>Ctenotus ora</i>	P3	-	Sandy substrates with low vegetation (including heath) in open <i>Eucalyptus/Corymbia</i> woodland over <i>Banksia</i> .	No/Marginal	Would Not Occur.	None Identified/Negligible
Migratory Shorebirds/Wetland Species/Marine Species (various reptiles, birds and mammals)	S5, Various	Ma, Mig, Various	Varies between species but includes open ocean, and permanent/temporary wetlands varying from billabongs, swamps, lakes, floodplains, sewerage farms, saltwork ponds, estuaries, lagoons, mudflats sandbars, pastures, airfields, sports fields and lawns.	No	Would Not Occur.	None Identified/Negligible
Eastern Osprey <i>Pandion haliaetus</i>	S5	Ma, Mig	Coasts, estuaries, bays, inlets, islands, and surrounding waters, coral atolls, reefs, lagoons, rock cliffs and stacks. Ascends larger rivers.	No	Would Not Occur.	None Identified/Negligible
Peregrine Falcon <i>Falco peregrinus</i>	S7	-	Diverse from rainforest to arid shrublands, from coastal heath to alpine Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes.	Yes	Possibly Occurs (on rare occasions).	Modification of foraging habitat. Negligible impact.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Possible Impacts
	BC Act/ DBCA Priority	EPBC Act				
Australasian Bittern <i>Botaurus poiciloptilus</i>	S2	EN	Freshwater wetlands, occasionally estuarine; prefers heavy vegetation such as beds of tall dense <i>Typha</i> , <i>Baumea</i> and sedges in freshwater swamps.	No	Would Not Occur.	None Identified/Negligible
Blue-billed Duck <i>Oxyura australis</i>	P4	-	Well vegetated freshwater swamps, large dams and lakes, winters on more open water. Occasionally salt lakes and estuaries freshened by floodwaters.	No	Would Not Occur.	None Identified/Negligible
Hooded Plover <i>Thinornis rubricollis</i>	P4	-	Broad sandy ocean beaches and bays, coastal and inland salt lakes.	No	Would Not Occur.	None Identified/Negligible
Carnaby's Black Cockatoo <i>Calyptorhynchus latirostris</i>	S2	EN	Forests, woodlands, heathlands, farms; feeds on <i>Banksia</i> , <i>Hakea</i> and Marri.	Yes	Possibly Occurs,	Loss/modification of a very small area of habitat. Negligible impact.
Baudin's Black Cockatoo <i>Calyptorhynchus baudinii</i>	S2	EN	Mainly eucalypt forests where it feeds primarily on the marri seeds.	Yes	Possibly Occurs,	Loss/modification of a very small area of habitat. Negligible impact.
Forest Red-tailed Black Cockatoo <i>Calyptorhynchus banksii naso</i>	S3	VU	Eucalypt forests, feeds on marri, jarrah, blackbutt, karri, sheoak and snottygobble.	Yes	Known to Occur,	Loss/modification of a very small area of habitat. Negligible impact.
Fork-tailed Swift <i>Apus pacificus</i>	S5	Ma, Mig	Low to very high airspace over varied habitat from rainforest to semi desert.	Yes	Unlikely to Occur, Flyover only on very rare occasions.	None Identified/Negligible
Grey Wagtail <i>Motacilla cinerea</i>	S5	Mig, Ma	In Australia, near running water in disused quarries, sandy, rocky streams in escarpments and rainforest, sewerage ponds, ploughed fields and airfields.	No	Would Not Occur.	None Identified/Negligible
Western Whipbird <i>Psophodes nigrogularis nigrogularis</i>	S2	EN	Dense shrubland with an open overstorey.	No	Would Not Occur.	None Identified/Negligible
Chuditch <i>Dasyurus geoffroi</i>	S3	VU	Forest, mallee shrublands, woodland and desert. The densest populations have been found in riparian jarrah forest.	No/Marginal	Would Not Occur.	None Identified/Negligible
Numbat <i>Myrmecobius fasciatus</i>	S3	VU	Generally found in habitats dominated by eucalypts that provide hollow logs and branches for shelter and termites for food.	No	Would Not Occur.	None Identified/Negligible

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Possible Impacts
	BC Act/ DBCA Priority	EPBC Act				
South-western Brush-tailed Phascogale <i>Phascogale tapoatafa wambenger</i>	S6	-	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover.	No/Marginal	Unlikely to Occur.	None Identified/Negligible
Quenda <i>Isodon fusciventer</i>	P4	-	Dense scrubby, often swampy, vegetation with dense cover.	No/Marginal	Unlikely to Occur	None Identified/Negligible
Western Ringtail Possum <i>Pseudocheirus occidentalis</i>	S1	CR	Coastal peppermint, coastal peppermint-tuart, jarrah-marri associations, sheoak woodland, and eucalypt woodland and mallee.	Yes	Known to Occur.	Loss/modification of a small area of habitat. Death/injury of individuals during clearing.
Quokka <i>Setonix brachyurus</i>	S3	VU	Currently restricted to densely vegetated coastal heaths, swamps, riverine habitats including tea-tree thickets on sandy soils along creek systems.	No	Would Not Occur.	None Identified/Negligible
Woylie <i>Bettongia penicillata ogilbyi</i>	S1	EN	Open sclerophyll forest and woodland with a low, dense, understorey of tussock grasses or woody scrub.	Yes	Would Not Occur.	None Identified/Negligible
Western Brush Wallaby <i>Macropus irma</i>	P4	-	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets.	No	Would Not Occur.	None Identified/Negligible
Western False Pipistrelle <i>Falsistrellus mackenziei</i>	P4	-	Wet sclerophyll forest dominated by karri and in high rainfall zones of the jarrah and marri forest.	Yes/Marginal	Possibly Occurs	Modification of foraging habitat. Negligible impact.
Water Rat <i>Hydromys chrysogaster</i>	P4	-	Permanent water, fresh, brackish or marine.	No	Would Not Occur.	None Identified/Negligible

See Appendix A for conservation status codes

## 7. MANAGEMENT RECOMMENDATIONS

The following recommendations are provided for guidance for the formulation of a fauna management plan that should aim to reduce the impact on fauna and fauna habitat as much as reasonable and practicable. This listing is not exhaustive and liaison with relevant regulatory authorities should be undertaken if considered warranted. It is recommended that:

- Planning for road works should aim to avoid the need to clear as much of the existing vegetation as possible.
- During clearing operations a suitably experienced “fauna spotter” should be employed to inspect trees, large shrubs, ground cover, logs, and hollows (where possible) before clearing to reduce likelihood of injury to fauna. Trees/large shrubs observed to contain hollows or other potential fauna refuges (e.g. nests/dreys) should be felled in a manner that reduces the likelihood that fauna present will be injured. Hollows in fallen trees should be inspected for fauna prior to removal from the site. If feasible any fauna encountered should be relocated to suitable retained habitat nearby.
- During site works areas requiring clearing should be clearly marked and access to other areas restricted to prevent accidental clearing of areas to be retained.
- No dead, standing or fallen timber should be removed unnecessarily. Logs (hollow or not) and other debris resulting from land clearing should be used to enhance fauna habitat in untouched and rehabilitated areas if possible. Where possible, logs are to be retained either by pushing the logs into the retained bush land, when significant disturbance to the vegetation can be avoided, or the logs cut so that the length of log outside the clearing area remains insitu.
- All staff working on site should be made aware that native fauna is protected. Personnel working on the project should not be allowed to bring firearms, other weapons or pets onsite.
- Native fauna injured during clearing or normal site operations should be taken to a designated veterinary clinic or a DBCA nominated wildlife carer.
- Any holes, pits or trenches required for services should be kept open for only as long as necessary and suitable escape ramps (45° batter) and bridging provided if the site is to be left unattended for extended periods. Significant sized holes, pits or trenches should be inspected for fauna immediately prior to filling.



## 8. CONCLUSION

The fauna assessment within the study area was undertaken for the purposes of categorising the fauna assemblages and identifying fauna habitats present. Targeted searches for black cockatoo habitat and western ringtail possums were also carried out.

With respect to native vertebrate fauna, 12 mammals (includes nine bat species), 75 bird, 13 reptile and eight frog species have previously been recorded in the general area in similar habitat and some of these species have the potential to occur in or utilise sections of the subject site at times. Overall the sites fauna biodiversity values are however very low, a consequence of the areas long history of disturbance, the degraded nature, the small range of habitats present and their limited extent.

Of the 108 native animals that are listed as potentially occurring in the area, five are considered to be endangered/vulnerable or in need of special protection under State and/or Federal law. In addition, one DBCA priority species may also frequent the area at times.

The black cockatoo assessment identified 43 habitat trees within or near the subject site however none contain hollows or possible hollows potentially suitable for black cockatoos to use for nesting purposes. A small amount of black cockatoo foraging evidence was observed (chewed marri fruits). No evidence of roosting activity was recorded. Only a small area of black cockatoo habitat falls within or near the proposed clearing areas and therefore impacts are anticipated to be negligible.

Targeted surveys for the western ringtail possum identified the presence of a small number of individuals in one area, though they have the potential to be present in other areas, if only infrequently.

Most other conservation significant species known from the region are unlikely to be impacted on by the proposal due to the fact that the subject site does not contain their preferred habitat and therefore they are unlikely to be present. In cases where some habitat is present, likely impacts are anticipated to be low given the small area of clearing required and the fact that the clearing footprint is narrow and spread over a ~1.65 km length of road.

A number of other recommendations aimed at mitigating and minimising potential impacts on fauna and fauna habitat in general are provided in Section 8. These should be implemented by the proponent as part of existing or proposed management plans where considered reasonable and practicable.

If granted, it is recommended that DWER include a condition in the clearing permit requiring a “fauna specialist” to inspect vegetation for the presence of western ringtail possums (and other fauna) immediately prior to clearing.

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Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii*, Forest red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksii naso*.

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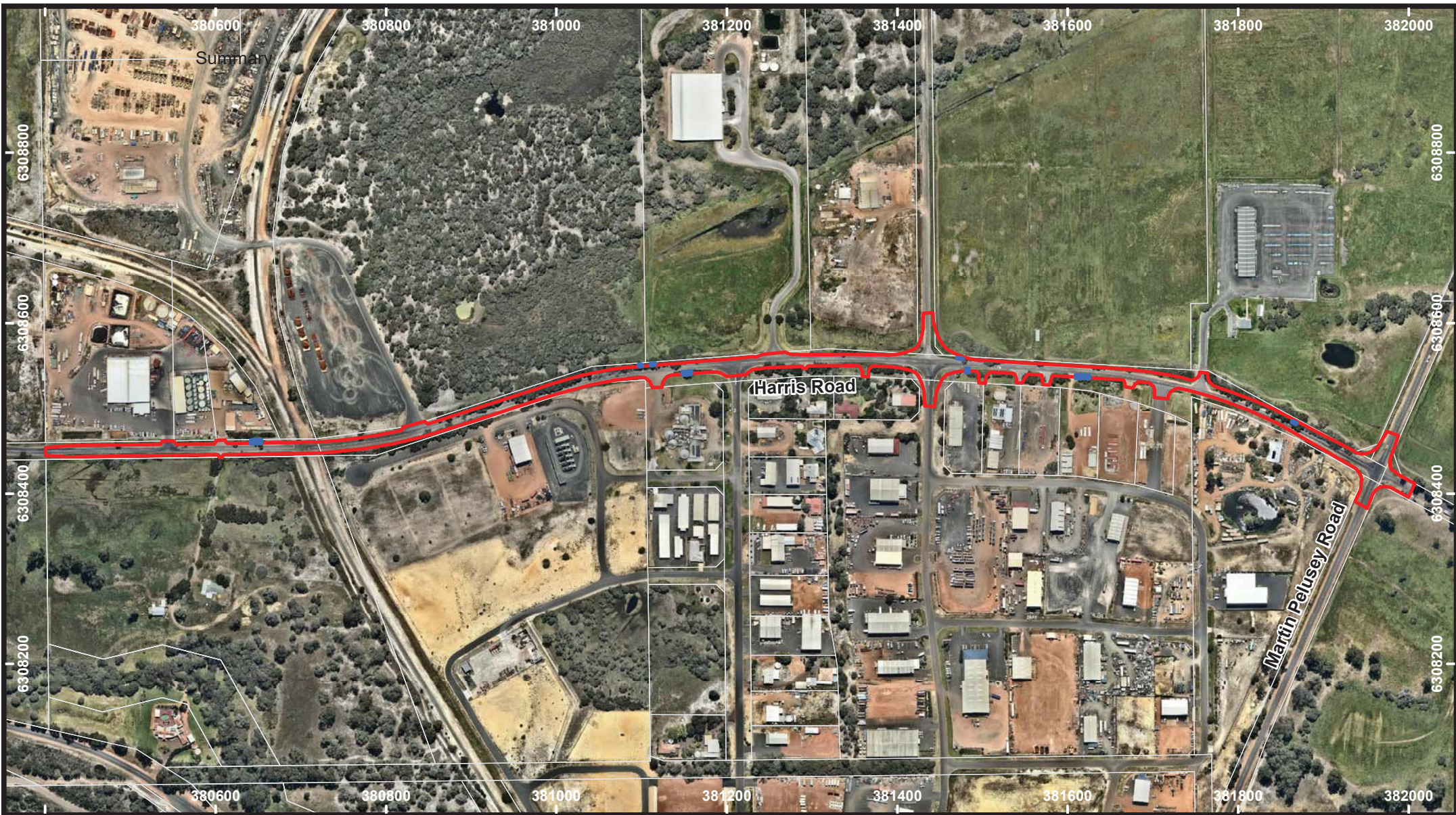
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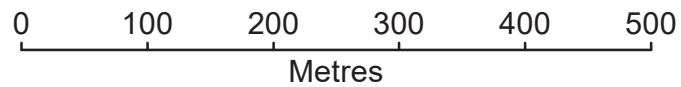
# FIGURES





**Legend**

- Subject Site
- Permit Areas (8689/1)

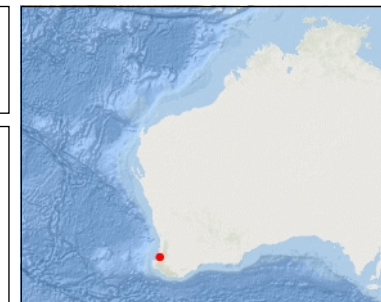


Drawn: G Harewood  
 Date: Nov 2019  
 Scale: 1:6,000  
 Projection/Coordinate System: UTM/MGA Zone 50

**Shire of Dardanup**  
**Harris Road**  
**SLK 0.00 - SLK 1.65**

**Aerial  
 Photograph**





- Legend**
- CPS areas applied to clear
  - Local Government Authorities
  - Roads - State Roads
  - Roads - Major Roads
  - Roads - Minor Roads
  - Cadastre (LGATE\_218) - SLIP

**Notes**

1: 1,128







- ### Legend
- CPS areas applied to clear
  - Local Government Authorities
  - Roads - State Roads
  - Roads - Major Roads
  - Roads - Minor Roads
  - Cadastre (LGATE\_218) - SLIP

### Notes

1: 1,128



Author:  
Recipient:





- Legend**
- CPS areas applied to clear
  - Local Government Authorities
  - Roads - State Roads
  - Roads - Major Roads
  - Roads - Minor Roads
  - Cadastre (LGATE\_218) - SLIP

**Notes**

1: 1,128







- Legend**
- CPS areas applied to clear
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  - Roads - Minor Roads
  - Cadastre (LGATE\_218) - SLIP

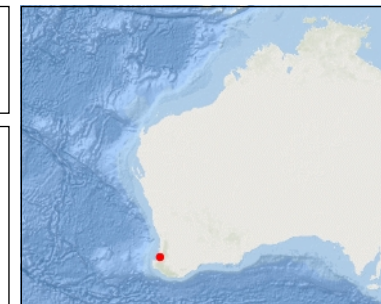
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**Notes**

Author:  
Recipient:





- Legend**
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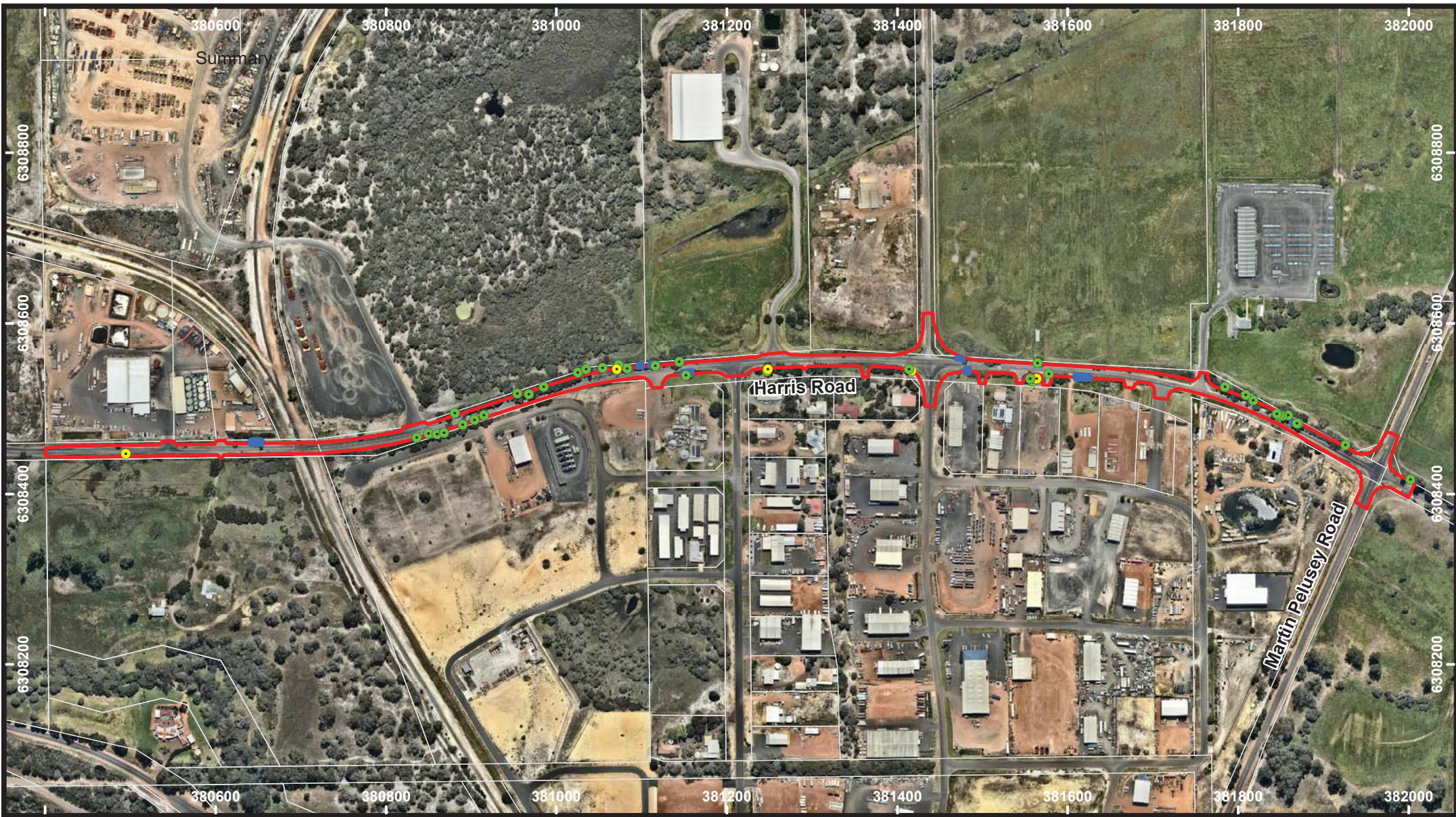
**Notes**

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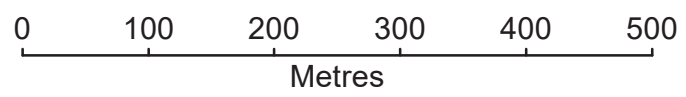
Author:  
Recipient:






### Legend

- Subject Site
- Permit Areas (8689/1)
- Habitat Tree - One or more possible small/medium hollows  
**None suitable for black cockatoos**
- Habitat Tree - No hollows seen





Fauna Survey

Drawn: G Harewood

Date: Nov 2019

Scale: 1:6,000

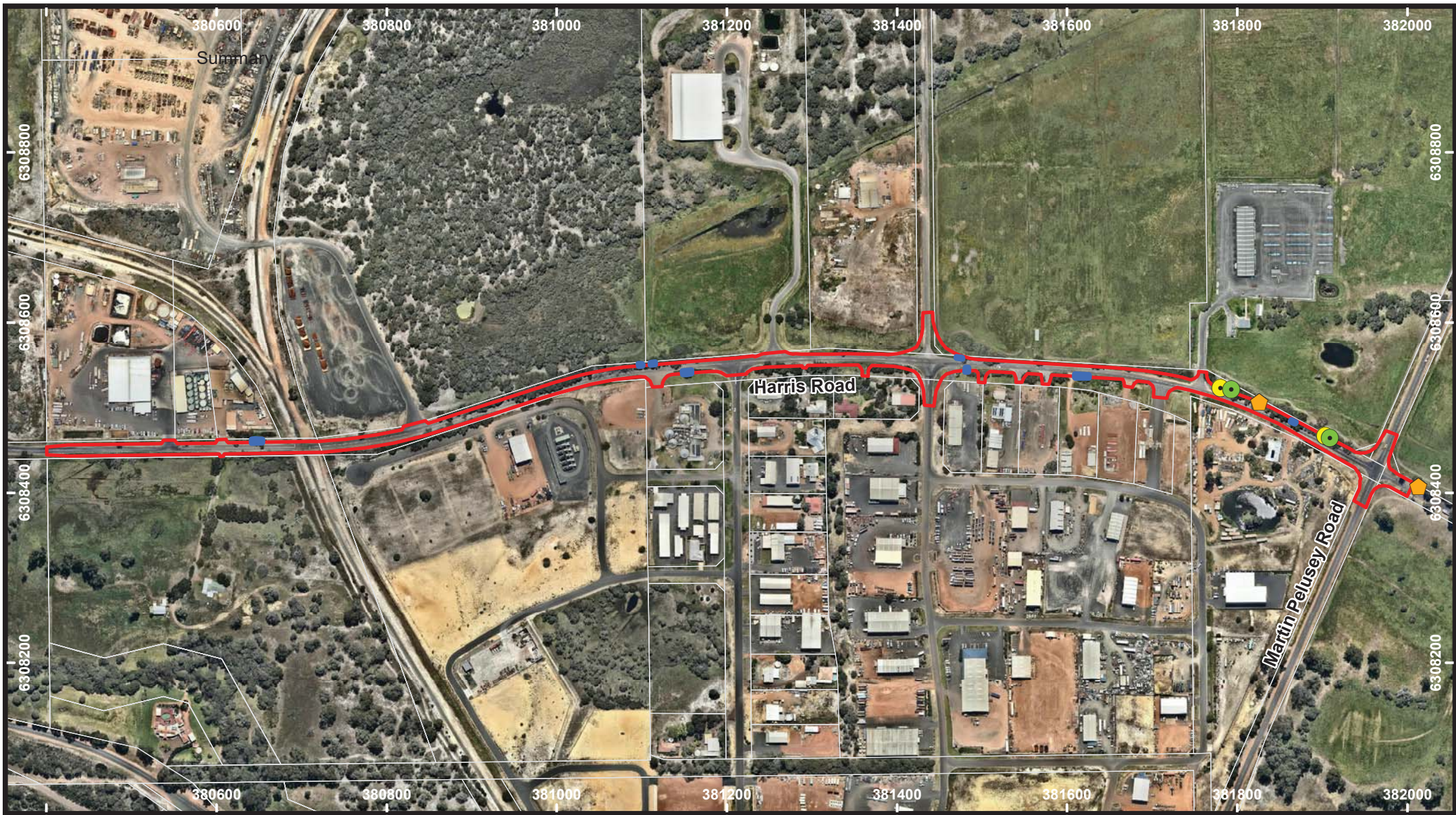
Projection/Coordinate System: UTM/MGA Zone 50

Shire of Dardanup  
Harris Road  
SLK 0.00 - SLK 1.65

**Habitat Trees  
(DBH >50cm)**

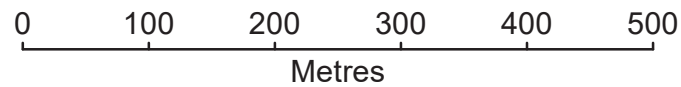
Figure: 7





**Legend**

- Subject Site
- Permit Areas (8689/1)
- ◆ Western Ringtail Possum Drey
- Western Ringtail Possum (Night 1)
- Western Ringtail Possum (Night 2)



Drawn: G Harewood  
Date: Nov 2019  
Scale: 1:6,000

Shire of Dardanup  
Harris Road  
SLK 0.00 - SLK 1.65

**Possum Observations**



# **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 2018 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 (S1) Critically Endangered species	CR	Threatened species considered to be facing an extremely high risk of extinction in the wild in the immediate future.
Schedule 2 (S2) Endangered species	EN	Threatened species considered to be facing a very high risk of extinction in the wild in the near future.
Schedule 3 (S3) Vulnerable species	VU	Threatened species considered to be facing a high risk of extinction in the wild in the medium-term future.
Schedule 4 (S4) Presumed extinct species	EX	Species which have been adequately searched for and there is no reasonable doubt that the last member of the species has died.
Schedule 5 (S5) Migratory birds protected under an international agreement	MI	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or 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 (S6) 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 (S7) Other specially protected fauna.	OS	Fauna otherwise in need of special protection to ensure their conservation.

## Western Australian DBCA 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 (P1) 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 (P2) 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 (P3) 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 (P4) 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 are close to qualifying for Vulnerable, but are not listed as Conservation Dependent.</p> <p>(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>

\*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**

## **POTENTIAL VERTEBRATE FAUNA LISTING**



# Fauna Observed or Potentially in Subject Site

Approx. centroid = 33.35572° S 115.72333°E

Compiled by Greg Harewood = Nov 2019

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

## Harris Road (SLK 0.00 - 1.65), Picton East, W.A.

A = Harewood, G (2019). Fauna Assessment - Harris Road (SLK 0.00 - 1.65), Picton East. Unpublished report for Shire of Dardanup

B= EPA (2008). Advice on areas of conservation significance in the Preston Industrial Park. Bulletin 1282 March 2008. List of vertebrate species recorded from Investigation Areas - Appendix 5.

C= Harewood, G. (2010). Fauna Survey (Level 2). Kemerton Industrial Core. Unpublished report for Cardno (WA) Pty Ltd.

D = ENV Australia (2007). Edith Cowan University South West Campus, Bunbury, Fauna Assessment (Level 2). Unpublished report for ECU.

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

F = ENV Australia (2004). North Boyanup District Structure Plan. Unpublished report for the DPI. (Level 1 survey results - G Harewood).

G = 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).

H = DBCA (2019). NatureMap Database search. "By Circle" 115° 43' 24" E, 33° 21' 21" S – Subject Site (plus 20km buffer). 21 Nov 2019.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Amphibia</b>							
<b>Myobatrachidae</b>										
Ground or Burrowing Frogs										
<i>Crinia georgiana</i>	Quacking Frog	LC		X						X
<i>Crinia glauerti</i>	Clicking Frog	LC		X				X	X	X
<i>Crinia insignifera</i>	Squelching Froglet	LC		X	X	X	X			X
<i>Geocrinia leai</i>	Ticking Frog	LC							X	X
<i>Heleioporus eyrei</i>	Moaning Frog	LC		X	X		X			X

BC Act Status - S1 to S7, EPBC Act Status - CR = Critically Endangered, EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA 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 <https://www.iucnredlist.org/resources/categories-and-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<i>Limnodynastes dorsalis</i>	Western Banjo Frog	LC			X	X	X

### Hylidae

Tree or Water-Holding Frogs

<i>Litoria adelaidensis</i>	Slender Tree Frog	LC		X	X	X	X		X	X
<i>Litoria moorei</i>	Motorbike Frog	LC		X	X		X		X	X

## Reptilia

### Gekkonidae

Geckoes

<i>Christinus marmoratus</i>	Marbled Gecko			X	X	X	X		X	X
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### Varanidae

Monitor's or Goanna's

<i>Varanus gouldii</i>	Sand Monitor				X		X	X		X
<i>Varanus rosenbergi</i>	Heath Monitor			X	X					X

BC Act Status - S1 to S7, EPBC Act Status - CR = Critically Endangered, EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA 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 <https://www.iucnredlist.org/resources/categories-and-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Scincidae</b> Skinks							
<i>Acritoscincus trilineatum</i>	Southwestern Cool Skink			X	X	X				X
<i>Cryptoblepharus buchananii</i>	Fence Skink			X	X	X	X			X
<i>Egernia kingii</i>	King's Skink					X	X		X	X
<i>Hemiergis quadrilineata</i>	Three-toed Mulch Skink				X	X	X			X
<i>Lerista elegans</i>	West Coast Four-toed Lerista				X		X			X
<i>Menetia greyii</i>	Dwarf Skink			X	X		X			X
<i>Morethia lineocellata</i>	West Coast Pale-flecked Morethia				X	X	X			X
<i>Tiliqua rugosa</i>	Bobtail			X	X	X	X	X	X	X

BC Act Status - S1 to S7, EPBC Act Status - CR = Critically Endangered, EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA 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 <https://www.iucnredlist.org/resources/categories-and-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Elapidae</b> Elapid Snakes							
<i>Notechis scutatus</i>	Tiger Snake				X		X	X	X	X
<i>Pseudonaja affinis</i>	Dugite			X	X		X	X	X	X

## Aves

### Phasianidae

Quails, Pheasants

<i>Coturnix pectoralis</i>	Stubble Quail	LC						X		X
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### Anatidae

Geese, Swans, Ducks

<i>Anas gracilis</i>	Grey Teal	LC		X				X	X	X
<i>Anas superciliosa</i>	Pacific Black Duck	LC		X				X	X	X
<i>Chenonetta jubata</i>	Australian Wood Duck	LC		X	X			X	X	X
<i>Tadorna tadornoides</i>	Australian Shelduck	LC		X				X	X	X

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Threskiornithidae</b> Ibises, Spoonbills							
<i>Threskiornis molucca</i>	Australian White Ibis	LC	X	X	X			X	X	
<i>Threskiornis spinicollis</i>	Straw-necked Ibis	LC		X	X			X		X

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Accipitridae</b> Kites, Goshawks, Eagles, Harriers							
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	Bp LC		X						X
<i>Accipiter fasciatus</i>	Brown Goshawk	Bp LC		X	X	X	X	X		X
<i>Aquila audax</i>	Wedge-tailed Eagle	Bp LC		X	X		X	X		X
<i>Aquila morphnoides</i>	Little Eagle	Bp LC		X						
<i>Circus approximans</i>	Swamp Harrier	LC			X			X	X	X
<i>Elanus caeruleus</i>	Black-shouldered Kite	LC		X	X				X	
<i>Haliastur sphenurus</i>	Whistling Kite	Bp LC			X	X	X	X	X	X
<i>Hamirostra isura</i>	Square-tailed Kite	Bp LC			X					

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Falconidae</b> Falcons							
<i>Falco berigora</i>	Brown Falcon	Bp LC								X
<i>Falco cenchroides</i>	Australian Kestrel	LC		X	X		X	X		X
<i>Falco longipennis</i>	Australian Hobby	LC					X		X	X
<i>Falco peregrinus</i>	Peregrine Falcon	S7 Bp LC								X
<b>Charadriidae</b> Lapwings, Plovers, Dotterels										
<i>Vanellus tricolor</i>	Banded Lapwing	LC								X

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Columbidae</b> Pigeons, Doves							
<i>Columba livia</i>	Domestic Pigeon	Introduced								X
<i>Ocyphaps lophotes</i>	Crested Pigeon	LC	X	X	X			X	X	X
<i>Phaps chalcoptera</i>	Common Bronzewing	Bh LC		X	X	X	X	X	X	X
<i>Streptopelia senegalensis</i>	Laughing Turtle-Dove	Introduced	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>Psittacidae</b> Parrots							
<i>Cacatua roseicapilla</i>	Galah	LC	X	x	X	X	X		X	
<i>Cacatua sanguinea</i>	Little Corella	LC	X	X	X	X				X
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo	S3 VU Bp LC	X	X	X		X			X
<i>Calyptorhynchus baudinii</i>	Baudin's Black Cockatoo	S2 EN Bp EN		X	X					X
<i>Calyptorhynchus latirostris</i>	Carnaby's Black Cockatoo	S2 EN Bp EN		X	X	X	X			X
<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet	LC							X	
<i>Neophema elegans</i>	Elegant Parrot	LC		X	X			X		X
<i>Platycercus icterotis icterotis</i>	Western Rosella (western ssp)	Bp LC		X		X		X	X	X
<i>Platycercus spurius</i>	Red-capped Parrot	LC	X	X	X	X	X	X	X	X
<i>Platycercus zonarius</i>	Australian Ringneck	LC	X	X	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
			<i>Polytelis anthopeplus</i>	Regent Parrot	LC			X	X	X
<b>Cuculidae</b> Parasitic Cuckoos										
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo	LC		X			X		X	X
<i>Chrysococcyx basalis</i>	Horsfield's Bronze Cuckoo	LC		X					X	
<i>Chrysococcyx lucidus</i>	Shining Bronze Cuckoo	LC		X	X				X	X
<i>Cuculus pallidus</i>	Pallid Cuckoo	LC							X	
<b>Strigidae</b> Hawk Owls										
<i>Ninox novaeseelandiae</i>	Boobook Owl	LC			X					
<b>Tytonidae</b> Barn Owls										
<i>Tyto alba</i>	Barn Owl	LC								X

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Podargidae</b> Frogmouths							
<i>Podargus strigoides</i>	Tawny Frogmouth	LC			X			X		X
<b>Halcyonidae</b> Tree Kingfishers										
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Introduced	X	X	X	X	X	X	X	X
<i>Todiramphus sanctus</i>	Sacred Kingfisher	LC		X	X	X		X	X	X
<b>Meropidae</b> Bee-eaters										
<i>Merops ornatus</i>	Rainbow Bee-eater	JA LC		X	X		X	X	X	X
<b>Maluridae</b> Fairy Wrens, GrassWrens										
<i>Malurus splendens</i>	Splendid Fairy-wren	Bh LC		X	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>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	X	X	X
<i>Gerygone fusca</i>	Western Gerygone	LC	X	X	X	X	X	X	X	X
<i>Sericornis maculatus</i>	Spotted Scrubwren	Bh LC		X	X			X	X	X
<i>Smicromnis brevirostris</i>	Weebill	Bh LC		X	X	X	X		X	X
<b>Pardalotidae</b> Pardalotes										
<i>Pardalotus punctatus</i>	Spotted Pardalote	LC		X						X
<i>Pardalotus striatus</i>	Striated Pardalote	LC	X	X	X	X	X	X	X	X

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			<b>Meliphagidae</b> Honeyeaters, Chats							
<i>Acanthorhynchus superciliosus</i>	Western Spinebill	LC		X	X	X				X
<i>Anthochaera carunculata</i>	Red Wattlebird	LC	X	X	X	X	X	X	X	X
<i>Lichenostomus virescens</i>	Singing Honeyeater	LC				X				
<i>Lichmera indistincta</i>	Brown Honeyeater	LC	X	X	X	X		X	X	X
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	Bp LC		X	X	X			X	X
<b>Petroicidae</b> Australian Robins										
<i>Petroica multicolor</i>	Scarlet Robin	Bh LC		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>Pachycephalidae</b> Crested Shrike-tit, Crested Bellbird, Shrike Thrushes, Whistlers							
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	Bh LC		X	X	X	X	X	X	X
<i>Pachycephala occidentalis</i>	Western Whistler	Bh LC		X	X	X	X	X	X	
<i>Pachycephala rufiventris</i>	Rufous Whistler	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	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	X	X
<b>Campephagidae</b> Cuckoo-shrikes, Trillers										
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	LC	X	X	X	X	X	X	X	X
<i>Lalage tricolor</i>	White-winged Triller	LC		X				X	X	

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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	X	X	X
<i>Artamus cyanopterus</i>	Dusky Woodswallow	Bp LC		X						X
<b>Cracticidae</b> Currawongs, Magpies & Butcherbirds										
<i>Cracticus tibicen</i>	Australian Magpie	LC		X	X	X	X	X	X	X
<i>Cracticus torquatus</i>	Grey Butcherbird	LC		X	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	X
<b>Motacillidae</b> Old World Pipits, Wagtails										
<i>Anthus australis</i>	Australian Pipit	LC		X	X					

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
			<b>Hirundinidae</b> Swallows, Martins							
<i>Hirundo neoxena</i>	Welcome Swallow	LC	X	X	X	X	X	X	X	X
<i>Hirundo nigricans</i>	Tree Martin	LC		X	X	X	X	X	X	
<b>Sylviidae</b> Old World Warblers										
<i>Cincloramphus cruralis</i>	Brown Songlark	LC								
<i>Cincloramphus mathewsi</i>	Rufous Songlark	LC								
<b>Zosteropidae</b> White-eyes										
<i>Zosterops lateralis</i>	Silvereye	LC		X	X	X	X		X	X
<b>Mammalia</b>										
<b>Phalangeridae</b> Brushtail Possums, Cuscuses										
<i>Trichosurus vulpecula vulpecula</i>	Common Brushtail Possum	LC		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>Pseudocheiridae</b> Ringtail Possums							
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	S1 CR CR	X	X	X	X	X	X	X	X
<b>Macropodidae</b> Kangaroos, Wallabies										
<i>Macropus fuliginosus</i>	Western Grey Kangaroo	LC		X	X	X	X	X	X	X
<b>Molossidae</b> Freetail Bats										
<i>Mormopterus planiceps</i>	Southern Freetail-bat	LC			X					
<i>Tadarida australis</i>	White-striped Freetail-bat	LC			X				X	

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			<b>Vespertilionidae</b> Ordinary Bats							
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	LC			X		X			X
<i>Chalinolobus morio</i>	Chocolate Wattled Bat	LC			X					X
<i>Falsistrellus mackenziei</i>	Western False Pipistrelle	P4 NT			X		X			X
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	LC			X		X			X
<i>Nyctophilus gouldi</i>	Gould's Long-eared Bat	LC					X			X
<i>Nyctophilus major</i>	Western Long-eared Bat	LC			X					
<i>Vespadelus regulus</i>	Southern Forest Bat	LC			X		X			X
<b>Muridae</b> Rats, Mice										
<i>Mus musculus</i>	House Mouse	Introduced					X		X	X
<i>Rattus rattus</i>	Black Rat	Introduced				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>Canidae</b> Dogs, Foxes							
<i>Vulpes vulpes</i>	Red Fox	Introduced			X	X	X	X		X
<b>Felidae</b> Cats										
<i>Felis catus</i>	Cat	Introduced			X	X	X			X
<b>Leporidae</b> Rabbits, Hares										
<i>Oryctolagus cuniculus</i>	Rabbit	Introduced			X	X	X	X		X

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# **APPENDIX C**

## **DBCA NATUREMAP & PROTECTED MATTERS SEARCH TOOL RESULTS**

# NatureMap - Harris Road

Created By Greg Harewood on 21/11/2019

**Kingdom** Animalia  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Method** 'By Circle'  
**Centre** 115° 43' 24" E, 33° 21' 21" S  
**Buffer** 20km  
**Group By** Species Group

Species Group	Species	Records
Amphibian	11	433
Bird	220	14856
Fish	69	118
Invertebrate	121	434
Mammal	52	4544
Reptile	49	775
<b>TOTAL</b>	<b>522</b>	<b>21160</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.	25401 <i>Crinia pseudinsignifera</i> (Bleating Froglet)			
5.	25404 <i>Geocrinia leai</i> (Ticking Frog)			
6.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
7.	25411 <i>Heleioporus inornatus</i> (Whooping Frog)			
8.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
9.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
10.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
11.	25433 <i>Pseudophryne guentheri</i> (Crawling Toadlet)			
<b>Bird</b>				
12.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
13.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
14.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
15.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
16.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
17.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
18.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
19.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
20.	25544 <i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
21.	24301 <i>Aegotheles cristatus</i> subsp. <i>cristatus</i> (Australian Owlet-nightjar)			
22.	24310 <i>Anas castanea</i> (Chestnut Teal)			
23.	24312 <i>Anas gracilis</i> (Grey Teal)			
24.	24313 <i>Anas platyrhynchos</i> (Mallard)			
25.	<i>Anas platyrhynchos</i> subsp. <i>domesticus</i>			
26.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
27.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
28.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
29.	24506 <i>Anous tenuirostris</i> subsp. <i>melanops</i> (Australian Lesser Noddy)		T	
30.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
31.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
32.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
33.	25558 <i>Ardea ibis</i> (Cattle Egret)			
34.	41324 <i>Ardea modesta</i> (great egret, white egret)			
35.	24340 <i>Ardea novaehollandiae</i> (White-faced Heron)			
36.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
37.	41326 <i>Ardenna carneipes</i> (Flesh-footed Shearwater, Fleshy-footed Shearwater)		T	
38.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
39.	25736 <i>Arenaria interpres</i> (Ruddy Turnstone)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
			IA	
40.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
41.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
42.	24318 <i>Aythya australis</i> (Hardhead)			
43.	<i>Barnardius zonarius</i>			
44.	24319 <i>Biziura lobata</i> (Musk Duck)			
45.	24359 <i>Burhinus grallarius</i> (Bush Stone-curlew)			
46.	25714 <i>Cacatua pastinator</i> (Western Long-billed Corella)			
47.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
48.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
49.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
50.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
51.	24780 <i>Calidris alba</i> (Sanderling)		IA	
52.	25738 <i>Calidris canutus</i> (Red Knot, knot)		IA	
53.	24784 <i>Calidris ferruginea</i> (Curllew Sandpiper)		T	
54.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
55.	24790 <i>Calidris tenuirostris</i> (Great Knot)		T	
56.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
57.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black Cockatoo)		T	
58.	24733 <i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)		T	
59.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)		T	
60.	48400 <i>Calyptorhynchus</i> sp. (white-tailed black cockatoo)		T	
61.	25575 <i>Charadrius leschenaultii</i> (Greater Sand Plover)		T	
62.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
63.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
64.	<i>Chroicocephalus novaehollandiae</i>			
65.	25601 <i>Chrysococcyx lucidus</i> (Shining Bronze Cuckoo)			
66.	24432 <i>Chrysococcyx lucidus</i> subsp. <i>plagosus</i> (Shining Bronze Cuckoo)			
67.	24288 <i>Circus approximans</i> (Swamp Harrier)			
68.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
69.	47915 <i>Climacteris rufus</i> (Black-tailed Treecreeper)			
70.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
71.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
72.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
73.	25592 <i>Corvus coronoides</i> (Australian Raven)			
74.	24417 <i>Corvus coronoides</i> subsp. <i>perplexus</i> (Australian Raven)			
75.	<i>Corvus splendens</i> subsp. <i>protegatus</i>			
76.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			
77.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
78.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
79.	<i>Cracticus torquatus</i>			
80.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
81.	24322 <i>Cygnus atratus</i> (Black Swan)			
82.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
83.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
84.	25618 <i>Diomedea exulans</i> (Wandering Albatross)		T	
85.	30836 <i>Diomedea exulans</i> subsp. <i>exulans</i> (Snowy Albatross)		T	
86.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
87.	<i>Egretta garzetta</i>			
88.	<i>Egretta novaehollandiae</i>			
89.	<i>Elanus axillaris</i>			
90.	47937 <i>Elsayornis melanops</i> (Black-fronted Dotterel)			
91.	<i>Eolophus roseicapillus</i>			
92.	24651 <i>Eopsaltria australis</i> subsp. <i>griseogularis</i> (Western Yellow Robin)			
93.	24652 <i>Eopsaltria georgiana</i> (White-breasted Robin)			
94.	24567 <i>Epthianura albifrons</i> (White-fronted Chat)			
95.	24379 <i>Erythronyx cinctus</i> (Red-kneed Dotterel)			
96.	24813 <i>Eudyptes chrysocome</i> subsp. <i>filholi</i> (Rockhopper Penguin)			Y
97.	25746 <i>Eudyptula minor</i> (Little Penguin)			
98.	24368 <i>Eurostopodus argus</i> (Spotted Nightjar)			
99.	25621 <i>Falco berigora</i> (Brown Falcon)			
100.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
101.	24472 <i>Falco cenchroides</i> subsp. <i>cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
102.	25623 <i>Falco longipennis</i> (Australian Hobby)			
103.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
104.	24616 <i>Falculunculus frontatus</i> subsp. <i>leucogaster</i> (Western Shrike-tit, Crested Shrike-tit)			
105.	25727 <i>Fulica atra</i> (Eurasian Coot)			
106.	24761 <i>Fulica atra</i> subsp. <i>australis</i> (Eurasian Coot)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
107.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
108.	24763 <i>Gallinula tenebrosa</i> subsp. <i>tenebrosa</i> (Dusky Moorhen)			
109.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			
110.	24765 <i>Gallirallus philippensis</i> subsp. <i>mellori</i> (Buff-banded Rail)			
111.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
112.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
113.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			
114.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
115.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
116.	24689 <i>Halobaena caerulea</i> (Blue Petrel)			
117.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
118.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
119.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
120.	48587 <i>Hydroprogne caspia</i> (Caspian Tern)		IA	
121.	24511 <i>Larus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Silver Gull)			
122.	25638 <i>Larus pacificus</i> (Pacific Gull)			
123.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
124.	30932 <i>Limosa lapponica</i> (Bar-tailed Godwit)		IA	
125.	25741 <i>Limosa limosa</i> (Black-tailed Godwit)		IA	
126.	24690 <i>Macronectes giganteus</i> (Southern Giant Petrel)		IA	
127.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
128.	25650 <i>Malurus elegans</i> (Red-winged Fairy-wren)			
129.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
130.	25758 <i>Megalurus gramineus</i> (Little Grassbird)			
131.	25663 <i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
132.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
133.	<i>Microcarbo melanoleucos</i>			
134.	48008 <i>Morus serrator</i> (Australasian Gannet)			
135.	25610 <i>Myiagra inquieta</i> (Restless Flycatcher)			
136.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
137.	24739 <i>Neophema petrophila</i> (Rock Parrot)			
138.	24798 <i>Numenius madagascariensis</i> (Eastern Curlew)		T	
139.	25742 <i>Numenius phaeopus</i> (Whimbrel)		IA	
140.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
141.	24497 <i>Oceanites oceanicus</i> (Wilson's Storm-petrel)		IA	
142.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
143.	41347 <i>Onychoprion anaethetus</i> (Bridled Tern)		IA	
144.	24328 <i>Oxyura australis</i> (Blue-billed Duck)		P4	
145.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
146.	24692 <i>Pachyptila belcheri</i> (Slender-billed Prion)			
147.	24693 <i>Pachyptila desolata</i> (Antarctic Prion)			
148.	25707 <i>Pachyptila salvini</i> (Salvin's Prion)			
149.	48591 <i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
150.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
151.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
152.	25687 <i>Passer domesticus</i> (House Sparrow)	Y		
153.	24642 <i>Passer montanus</i> (Eurasian Tree Sparrow)	Y		
154.	24649 <i>Pelecanoides urinatrix</i> subsp. <i>exsul</i> (Common Diving Petrel)			
155.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
156.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
157.	48066 <i>Petroica boodang</i> (Scarlet Robin)			
158.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
159.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
160.	24664 <i>Phalacrocorax carbo</i> subsp. <i>novaehollandiae</i> (Great Cormorant)			
161.	24665 <i>Phalacrocorax fuscescens</i> (Black-faced Cormorant)			
162.	25698 <i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
163.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
164.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
165.	24668 <i>Phalacrocorax varius</i> subsp. <i>hypoleucos</i> (Pied Cormorant)			
166.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
167.	25587 <i>Phaps elegans</i> (Brush Bronzewing)			
168.	48071 <i>Phylidonyris niger</i> (White-cheeked Honeyeater)			
169.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
170.	24841 <i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
171.	24842 <i>Platalea regia</i> (Royal Spoonbill)			
172.	25720 <i>Platycercus icterotis</i> (Western Rosella)			
173.	24745 <i>Platycercus icterotis</i> subsp. <i>icterotis</i> (Western Rosella)			
174.	24747 <i>Platycercus spurius</i> (Red-capped Parrot)			
175.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
176.	24843 <i>Plegadis falcinellus</i> (Glossy Ibis)		IA	

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177.	24382 <i>Pluvialis fulva</i> (Pacific Golden Plover)		IA	
178.	24383 <i>Pluvialis squatarola</i> (Grey Plover)		IA	
179.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
180.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
181.	24681 <i>Poliocephalus poliocephalus</i> (Hoary-headed Grebe)			
182.	25722 <i>Polytelis anthopeplus</i> (Regent Parrot)			
183.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
184.	24767 <i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)			
185.	24769 <i>Porzana fluminea</i> (Australian Spotted Crane)			
186.	24771 <i>Porzana tabuensis</i> (Spotless Crane)			
187.	24388 <i>Psophodes nigrogularis</i> subsp. <i>nigrogularis</i> (Western Whipbird (western heath))		T	
188.	24702 <i>Pterodroma brevirostris</i> (Kerguelen Petrel)			
189.	24703 <i>Pterodroma lessonii</i> (White-headed Petrel)			
190.	<i>Pterodroma macroptera</i> subsp. <i>macroptera</i>			
191.	25711 <i>Pterodroma mollis</i> (Soft-plumaged Petrel)			
192.	24711 <i>Puffinus assimilis</i> subsp. <i>assimilis</i> (Little Shearwater)			
193.	<i>Purpureicephalus spurius</i>			
194.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
195.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
196.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
197.	25616 <i>Rhipidura rufiventris</i> (Northern Fantail)			
198.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
199.	30948 <i>Smicromis brevirostris</i> (Weebill)			
200.	24645 <i>Stagonopleura oculata</i> (Red-eared Firetail)			
201.	24522 <i>Sterna bergii</i> (Crested Tern)			
202.	25642 <i>Sterna hirundo</i> (Common Tern)		IA	
203.	48594 <i>Sternula nereis</i> (Fairy Tern)			
204.	24329 <i>Stictonetta naevosa</i> (Freckled Duck)			
205.	25655 <i>Stipiturus malachurus</i> (Southern Emu-wren)			
206.	24554 <i>Stipiturus malachurus</i> subsp. <i>westernensis</i> (Southern Emu-wren)			
207.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
208.	25589 <i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
209.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
210.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
211.	24682 <i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
212.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
213.	34134 <i>Thalassarche carteri</i> (Indian Yellow-nosed Albatross)		T	
214.	44607 <i>Thalassarche melanophris</i> (Black-browed Albatross)		T	
215.	48597 <i>Thalasseus bergii</i> (Crested Tern)		IA	
216.	48135 <i>Thinornis rubricollis</i> (Hooded Plover, Hooded Dotterel)		P4	
217.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
218.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
219.	24309 <i>Todiramphus sanctus</i> subsp. <i>sanctus</i> (Sacred Kingfisher)			
220.	25723 <i>Trichoglossus haematodus</i> (Rainbow Lorikeet)			
221.	24755 <i>Trichoglossus haematodus</i> subsp. <i>moluccanus</i> (Rainbow Lorikeet)	Y		
222.	24803 <i>Tringa brevipes</i> (Grey-tailed Tattler)		P4	
223.	24806 <i>Tringa glareola</i> (Wood Sandpiper)		IA	
224.	24808 <i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	
225.	24809 <i>Tringa stagnatilis</i> (Marsh Sandpiper, little greenshank)		IA	
226.	48147 <i>Turnix varius</i> (Painted Button-quail)			
227.	24852 <i>Tyto alba</i> subsp. <i>delicatula</i> (Barn Owl)			
228.	25577 <i>Vanellus miles</i> (Masked Lapwing)			
229.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
230.	41351 <i>Xenus cinereus</i> (Terek Sandpiper)		IA	
231.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			

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232.	<i>Acentrogobius bifrenatus</i>			
233.	<i>Aetapcus maculatus</i>			
234.	<i>Aldrichetta forsteri</i>			
235.	<i>Anoplocapros lenticularis</i>			
236.	<i>Aracana aurita</i>			
237.	<i>Arenigobius bifrenatus</i>			
238.	<i>Arripis truttacea</i>			
239.	<i>Asymbolus submaculatus</i>			
240.	<i>Atherinosoma elongata</i>			
241.	<i>Aulohalaehurus labiosus</i>			
242.	<i>Auxis thazard</i>			
243.	<i>Carcharhinus</i> sp.			
244.	<i>Chelidonichthys kumu</i>			



Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
245.	<i>Cleidopus gloriamaris</i>			
246.	<i>Dactylophora nigricans</i>			
247.	<i>Diodon nichthemerus</i>			
248.	<i>Diodon</i> sp.			
249.	<i>Echeneis naucrates</i>			
250.	<i>Elops hawaiiensis</i>			
251.	<i>Eubalichthys</i> sp.			
252.	<i>Euleptorhamphus viridis</i>			
253.	<i>Furgaleus macki</i>			
254.	34028 <i>Galaxias occidentalis</i> (Western Minnow)			
255.	<i>Galeorhinus galeus</i>			
256.	34030 <i>Geotria australis</i> (Pouched Lamprey)		P3	
257.	<i>Gonorynchus greyi</i>			
258.	<i>Gymnapistes marmoratus</i>			
259.	<i>Gymnothorax woodwardi</i>			
260.	<i>Hemipristis elongata</i>			
261.	<i>Heterodontus portusjacksoni</i>			
262.	<i>Hippocampus</i> sp.			
263.	<i>Hyperlophus vittatus</i>			
264.	<i>Hyporhamphus melanochir</i>			
265.	<i>Ichthyoscopus barbatus</i>			
266.	<i>Lagocephalus sceleratus</i>			
267.	<i>Macroramphosus scolopax</i>			
268.	<i>Makaira indica</i>			
269.	<i>Meuschenia freycineti</i>			
270.	<i>Mugil cephalus</i>			
271.	<i>Muraenichthys tasmaniensis</i>			
272.	<i>Myliobatis</i> sp.			
273.	<i>Nannoperca vittata</i>			
274.	<i>Nelusetta ayraudi</i>			
275.	<i>Omegophora armilla</i>			
276.	<i>Ophisurus serpens</i>			
277.	<i>Ophthalmolepis lineolatus</i>			
278.	<i>Parablennius postoculomaculatus</i>			
279.	<i>Parazanclostius hutchinsi</i>			
280.	<i>Phyllopteryx taeniolatus</i>			
281.	<i>Platycephalus speculator</i>			
282.	<i>Prionace glauca</i>			
283.	<i>Pristiophorus nudipinnis</i>			
284.	<i>Pseudogobius olorum</i>			
285.	<i>Pterygotrigla polyommata</i>			
286.	<i>Rachycentron canadum</i>			
287.	<i>Scobinichthys granulatus</i>			
288.	<i>Scomber australasicus</i>			
289.	<i>Sillago fraseri</i> (invalid)			Y
290.	<i>Sphyræna obtusata</i>			
291.	<i>Squalus megalops</i>			
292.	<i>Squatina australis</i>			
293.	<i>Stigmatopora argus</i>			
294.	<i>Thyrsites atun</i>			
295.	<i>Trachinotus baillonii</i>			
296.	<i>Trachurus novaezelandiae</i>			
297.	<i>Trichiurus lepturus</i>			
298.	<i>Trichiurus</i> sp.			
299.	<i>Trygonoptera mucosa</i>			
300.	<i>Urolophus</i> sp.			

**Invertebrate**

301.	<i>Acariformes</i> sp.			
302.	<i>Akamptogonus novarae</i>			
303.	<i>Allothereua maculata</i>			
304.	<i>Amblyomma triguttatum</i>			
305.	<i>Aname mainae</i>			
306.	<i>Aname tepperi</i>			
307.	<i>Ancylidae</i> sp.			
308.	<i>Anisops</i> sp.			
309.	<i>Antichiropus nanus</i>			
310.	<i>Antiporus</i> sp.			
311.	<i>Arachnura higginsi</i>			
312.	<i>Araneus senicaudatus</i>			
313.	<i>Araneus senicaudatus</i> subsp. <i>simplex</i>			

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				Y
314.	<i>Argiope protensa</i>			
315.	<i>Argiope trifasciata</i>			
316.	<i>Arkys walckenaeri</i>			
317.	<i>Artonia linnaei</i>			
318.	<i>Artoriopsis expolita</i>			
319.	<i>Austracantha minax</i>			
320.	<i>Backobourkia brounii</i>			
321.	<i>Backobourkia heroine</i>			
322.	<i>Badumna insignis</i>			
323.	<i>Baetidae</i> sp.			
324.	<i>Baiami tegenarioides</i>			
325.	<i>Baiami volucripes</i>			
326.	<i>Berosus discolor</i>			
327.	<i>Berosus munitipennis</i>			
328.	47873 <i>Bertmainius opimus</i> (western pygmy trapdoor spider)		P3	
329.	<i>Caenidae</i> sp.			
330.	<i>Carabidae</i> sp.			
331.	<i>Celaenia excavata</i>			
332.	<i>Ceratopogonidae</i> sp.			
333.	<i>Cercophonius sulcatus</i>			
334.	33939 <i>Cherax cainii</i> (Marron)			
335.	<i>Cherax quinquecarinatus</i>			
336.	<i>Chironominae</i> sp.			
337.	<i>Chironomus</i> aff. <i>altmans</i> (V24) (CB)			
338.	<i>Chironomus tepperi</i>			
339.	<i>Corduliidae</i> sp.			
340.	<i>Corixidae</i> sp.			
341.	<i>Cormocephalus aurantiipes</i>			
342.	<i>Cormocephalus hartmeyeri</i>			
343.	<i>Cryptoerithus quobba</i>			
344.	<i>Culex</i> ( <i>Culex</i> ) <i>australicus</i>			
345.	<i>Cyclosa trilobata</i>			
346.	<i>Cyrtophora parnasia</i>			
347.	<i>Dingosa serrata</i>			
348.	<i>Dytiscidae</i> sp.			
349.	<i>Ecnomidae</i> sp.			
350.	<i>Erigone prominens</i>			
351.	<i>Eriophora biapicata</i>			
352.	<i>Gripopterygidae</i> sp.			
353.	<i>Gyrinidae</i> sp.			
354.	<i>Harrisius</i> sp.			
355.	<i>Helochares tenuistriatus</i>			
356.	<i>Hemicorduliidae</i> sp.			
357.	<i>Henicops dentatus</i>			
358.	<i>Hogna crispipes</i>			
359.	<i>Hydrophilidae</i> sp.			
360.	<i>Hydropsychidae</i> sp.			
361.	48935 <i>Idiosoma sigillatum</i> (Swan Coastal Plain shield-backed trapdoor spider)		P3	
362.	<i>Isopeda leishmanni</i>			
363.	<i>Kangarosa properipes</i>			
364.	<i>Kiefferulus intertinctus</i>			
365.	<i>Laetesia mollita</i>			
366.	<i>Lagynochthonius australicus</i>			
367.	<i>Lampona brevipes</i>			
368.	<i>Lampona cylindrata</i>			
369.	<i>Lampona punctigera</i>			
370.	<i>Lancetes lanceolatus</i>			
371.	<i>Latrodectus hasseltii</i>			
372.	<i>Leptoceridae</i> sp.			
373.	<i>Leptophlebiidae</i> sp.			
374.	<i>Limnoxenus zelandicus</i>			
375.	<i>Microvelia</i> sp.			
376.	<i>Missulena granulosa</i>			
377.	<i>Missulena hoggi</i>			
378.	<i>Missulena occatoria</i>			
379.	<i>Mituliodon tarantulinus</i>			
380.	<i>Mitzoruga insularis</i>			
381.	<i>Nephila edulis</i>			
382.	<i>Nicodamus mainae</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
383.	<i>Notonectidae</i> sp.			
384.	<i>Nunciella aspera</i>			
385.	<i>Oligochaeta</i> sp.			
386.	<i>Ommatoiulus moreletii</i>			
387.	<i>Oniscidae</i> sp.			
388.	<i>Orthocladinae</i> sp.			
389.	<i>Palaemonidae</i> sp.			
390.	<i>Paralimnophyes pullulus</i> (V42)			
391.	<i>Parastacidae</i> sp.			
392.	<i>Perthidae</i> sp.			
393.	<i>Pholcus phalangioides</i>			
394.	<i>Phryganoporus candidus</i>			
395.	<i>Platorish gelorup</i>			
396.	<i>Polypedium</i> nr. <i>convexum</i> (SAP)			
397.	<i>Raveniella arenacea</i>			
398.	<i>Raveniella peckorum</i>			
399.	<i>Rhantus suturalis</i>			
400.	<i>Scirtidae</i> sp.			
401.	<i>Scolopendra laeta</i>			
402.	<i>Scutigera indecisa</i>			
403.	<i>Simuliidae</i> sp.			
404.	<i>Staphylinidae</i> sp.			
405.	<i>Steatoda capensis</i>			
406.	<i>Steatoda grossa</i>			
407.	<i>Sternopriscus</i> sp.			
408.	<i>Synsphyronus magnus</i>			
409.	<i>Tabanidae</i> sp.			
410.	<i>Tamopsis distinguenda</i>			
411.	<i>Tanypodinae</i> sp.			
412.	<i>Tasmanicosa leuckartii</i>			
413.	<i>Telephlebiidae</i> sp.			
414.	<i>Tetrallycosa oraria</i>			
415.	<i>Tipulidae</i> sp.			
416.	<i>Urodacus novaehollandiae</i>			
417.	<i>Uvarus pictipes</i>			
418.	<i>Veliidae</i> sp.			
419.	<i>Venator immansueta</i>			
420.	<i>Venatrix pullastra</i>			
421.	34113 <i>Westralunio carteri</i> (Carter's Freshwater Mussel)		T	

**Mammal**

422.	25449 <i>Antechinus flavipes</i> (Yellow-footed Antechinus)			
423.	24088 <i>Antechinus flavipes</i> subsp. <i>leucogaster</i> (Yellow-footed Antechinus, Mardo)			
424.	24208 <i>Arctocephalus forsteri</i> (New Zealand Fur Seal, long-nosed fur-seal)		S	
425.	24209 <i>Arctocephalus tropicalis</i> (Subantarctic fur-seal)		T	
426.	24044 <i>Balaenoptera acutorostrata</i> (Dwarf Minke Whale)			
427.	24162 <i>Bettongia penicillata</i> subsp. <i>ogilbyi</i> (Woylie, Brush-tailed Bettong)		T	
428.	24251 <i>Bos taurus</i> (European Cattle)	Y		
429.	24072 <i>Caperea marginata</i> (Pygmy Right Whale)			
430.	24086 <i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)			
431.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattled Bat)			
432.	24187 <i>Chalinolobus morio</i> (Chocolate Wattled Bat)			
433.	24092 <i>Dasyurus geoffroi</i> (Chuditch, Western Quoll)		T	
434.	24043 <i>Eubalaena australis</i> (Southern Right Whale)		T	
435.	24189 <i>Falsistrellus mackenziei</i> (Western False Pipistrelle, Western Falsistrelle)		P4	
436.	24041 <i>Felis catus</i> (Cat)	Y		
437.	24215 <i>Hydromys chrysogaster</i> (Water-rat, Rakali)		P4	
438.	48588 <i>Isodon fusciventer</i> (Quenda, southwestern brown bandicoot)		P4	
439.	<i>Lobodon carcinophaga</i>			
440.	24132 <i>Macropus fuliginosus</i> (Western Grey Kangaroo)			
441.	24051 <i>Megaptera novaeangliae</i> (Humpback Whale)		S	
442.	24076 <i>Mesoplodon bowdoini</i> (Andrew's Beaked Whale)			
443.	24078 <i>Mesoplodon grayi</i> (Gray's Beaked Whale)			
444.	24081 <i>Mesoplodon mirus</i> (True's Beaked Whale)			
445.	24213 <i>Mirounga leonina</i> (Southern Elephant Seal)			
446.	48005 <i>Mormopterus kitcheneri</i> (South-western Free-tailed Bat)			
447.	24223 <i>Mus musculus</i> (House Mouse)	Y		
448.	24146 <i>Myrmecobius fasciatus</i> (Numbat, Walpurti)		T	
449.	24210 <i>Neophoca cinerea</i> (Australian Sea-lion)		T	
450.	48022 <i>Notamacropus irma</i> (Western Brush Wallaby)		P4	
451.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
452.	24195 <i>Nyctophilus gouldi</i> (Gould's Long-eared Bat)			
453.	24085 <i>Oryctolagus cuniculus</i> (Rabbit)	Y		
454.	25508 <i>Phascogale tapoatafa</i> (Brush-tailed Phascogale)		S	
455.	48070 <i>Phascogale tapoatafa</i> subsp. <i>wambenger</i> (South-western Brush-tailed Phascogale, Wambenger)		S	
456.	24073 <i>Physeter macrocephalus</i> (Sperm Whale)		T	
457.	24166 <i>Pseudocheirus occidentalis</i> (Western Ringtail Possum, ngwayir)		T	
458.	24243 <i>Rattus fuscipes</i> (Western Bush Rat)			
459.	24244 <i>Rattus norvegicus</i> (Brown Rat)	Y		
460.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
461.	24145 <i>Setonix brachyurus</i> (Quokka)		T	
462.	<i>Sminthopsis murina</i>			
463.	48113 <i>Stenella coeruleoalba</i> (Striped Dolphin)			
464.	48114 <i>Stenella longirostris</i> (Spinner Dolphin)		P4	
465.	24259 <i>Sus scrofa</i> (Pig)	Y		
466.	24207 <i>Tachyglossus aculeatus</i> (Short-beaked Echidna)			
467.	24167 <i>Tarsipes rostratus</i> (Honey Possum, Noolbenger)			
468.	25521 <i>Trichosurus vulpecula</i> (Common Brushtail Possum)			
469.	24158 <i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum)			
470.	30954 <i>Tursiops aduncus</i> (Indo-Pacific Bottlenose Dolphin)			
471.	24069 <i>Tursiops truncatus</i> (Bottlenose Dolphin)			
472.	24206 <i>Vespadelus regulus</i> (Southern Forest Bat)			
473.	24040 <i>Vulpes vulpes</i> (Red Fox)	Y		

### Reptile

474.	42368 <i>Acritoscincus trilineatus</i> (Western Three-lined Skink)			
475.	24990 <i>Aprasia pulchella</i> (Granite Worm-lizard)			
476.	24991 <i>Aprasia repens</i> (Sand-plain Worm-lizard)			
477.	25335 <i>Caretta caretta</i> (Loggerhead Turtle)		T	
478.	43380 <i>Chelodina colliei</i> (South-western Snake-necked Turtle)			
479.	25336 <i>Chelonia mydas</i> (Green Turtle)		T	
480.	24980 <i>Christinus marmoratus</i> (Marbled Gecko)			
481.	30893 <i>Cryptoblepharus buehananii</i>			
482.	25027 <i>Ctenotus australis</i>			
483.	25039 <i>Ctenotus fallens</i>			
484.	25047 <i>Ctenotus impar</i>			
485.	25049 <i>Ctenotus labillardieri</i>			
486.	41641 <i>Ctenotus ora</i> (Coastal Plains Skink)		P3	
487.	24939 <i>Diplodactylus polyophthalmus</i>			
488.	25251 <i>Echiopsis curta</i> (Bardick)			
489.	25096 <i>Egernia kingii</i> (King's Skink)			
490.	25100 <i>Egernia napoleonis</i>			
491.	25250 <i>Elapognathus coronatus</i> (Crowned Snake)			
492.	30919 <i>Hemiergis gracilipes</i> (skink)			
493.	25115 <i>Hemiergis initialis</i> subsp. <i>initialis</i>			
494.	25118 <i>Hemiergis peronii</i> subsp. <i>tridactyla</i>			
495.	25119 <i>Hemiergis quadrilineata</i>			
496.	44656 <i>Hydrophis major</i> (Olive-headed seasnake, greater seasnake)			
497.	42410 <i>Hydrophis ornatus</i> (Ornate Reef Seasnake, Sea Snake)			
498.	43384 <i>Hydrophis platurus</i> (Yellow-bellied Seasnake)			
499.	25131 <i>Lerista distinguenda</i>			
500.	25133 <i>Lerista elegans</i>			
501.	25154 <i>Lerista microtis</i> subsp. <i>microtis</i>			
502.	25005 <i>Lialis burtonis</i>			
503.	42413 <i>Lissolepis luctuosa</i> (Western Swamp Skink)			
504.	25184 <i>Menetia greyii</i>			
505.	25240 <i>Morelia spilota</i> subsp. <i>imbricata</i> (Carpet Python)			
506.	25191 <i>Morethia lineocellata</i>			
507.	25192 <i>Morethia obscura</i>			
508.	25344 <i>Natator depressus</i> (Flatback Turtle)		T	
509.	25248 <i>Neelaps bimaculatus</i> (Black-naped Snake)			
510.	25252 <i>Notechis scutatus</i> (Tiger Snake)			
511.	25253 <i>Parasuta gouldii</i>			
512.	25255 <i>Parasuta nigriceps</i>			
513.	25510 <i>Pogona minor</i> (Dwarf Bearded Dragon)			
514.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
515.	25511 <i>Pseudonaja affinis</i> (Dugite)			
516.	25259 <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
517.	25266 <i>Simoselaps bertholdi</i> (Jan's Banded Snake)			
518.	25519 <i>Tiliqua rugosa</i>			
519.	25207 <i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			



Name	ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
520.	24983	<i>Underwoodisaurus milii</i> (Barking Gecko)			
521.	25218	<i>Varanus gouldii</i> (Bungarra or Sand Monitor)			
522.	25225	<i>Varanus rosenbergi</i> (Heath Monitor)			

**Conservation Codes**

- T  Rare or likely to become extinct
- 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 21/11/19 12:14:38

[Summary](#)

[Details](#)

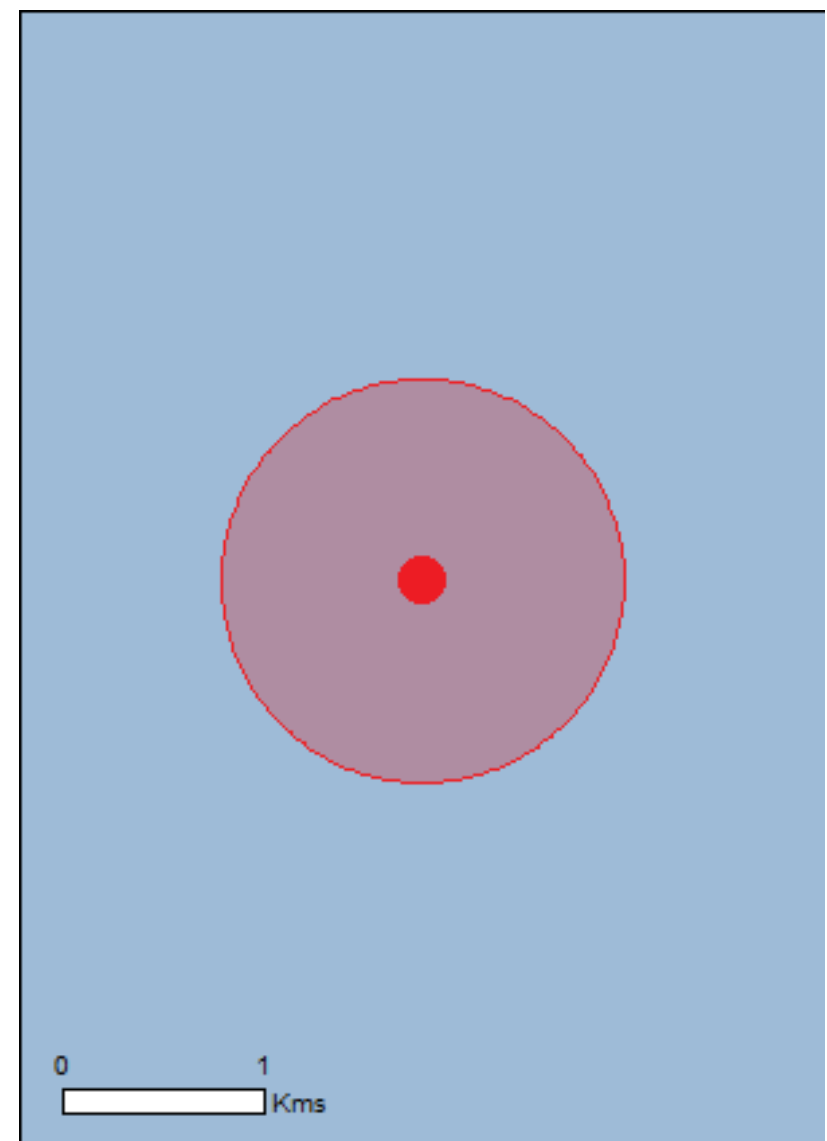
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

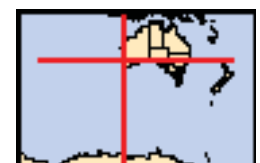
[Acknowledgements](#)



This map may contain data which are  
Commonwealth of Australia  
Geoscience Australia PSMA 2010

[Coordinates](#)

Buffer 1.0m



# 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>	2
<a href="#">Listed Threatened Species</a>	28
<a href="#">Listed Migratory Species</a>	9

## 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>	14
<a href="#">Whales and Other Cetaceans</a>	None
<a href="#">Critical Habitats</a>	None
<a href="#">Commonwealth Reserves Terrestrial</a>	None
<a href="#">Australian Marine Parks</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves</a>	None
<a href="#">Regional Forest Agreements</a>	None
<a href="#">Invasive Species</a>	28
<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 likely to occur within area
<a href="#">Tuart Eucalyptus gomphocephala Woodlands and Forests of the Swan Coastal Plain ecological community</a>	Critically Endangered	Community likely to occur within area

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

Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Botaurus poiciloptilus</a> Australasian Bittern 1001	Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot 1855	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper 1856	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo, Barrak 167034	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Calyptorhynchus baudinii</a> Baudin's Cockatoo, Long-billed Black-Cockatoo 1769	Endangered	Breeding known to occur within area
<a href="#">Calyptorhynchus latirostris</a> Carnaby's Cockatoo, Short-billed Black-Cockatoo 159523	Endangered	Species or species habitat known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew 1847	Critically Endangered	Species or species habitat may occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe 177037	Endangered	Species or species habitat may occur within area
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern 182950	Vulnerable	Species or species habitat may occur within area
<b>Fish</b>		
<a href="#">Nannatherina balstoni</a> Balston's Pygmy Perch 166698	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
<b>Mammals</b>		
<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll 330	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Pseudocheirus occidentalis</a> Western Ringtail Possum, Ngayir, Womp, Woder, Ngoor, Ngoolangit 25911	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Setonibrachyurus</a> Quokka 229	Vulnerable	Species or species habitat may occur within area
<b>Other</b>		
<a href="#">Westralunio carteri</a> Carter's Freshwater Mussel, Freshwater Mussel 86266	Vulnerable	Species or species habitat known to 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="#">Banksia nivea subsp. uliginosa</a> Samp oneypot 82766	Endangered	Species or species habitat may occur within area
<a href="#">Banksia squarrosa subsp. argillacea</a> Whicher Range Dryandra 82769	Vulnerable	Species or species habitat may occur within area
<a href="#">Brachyscias verecundus</a> Ironstone Brachyscias 81321	Critically Endangered	Species or species habitat may occur within area
<a href="#">Chamelaucium sp. S coastal plain (R.D.Royce 4872)</a> Royce's Waffleflower 87814	Vulnerable	Species or species habitat may occur within area
<a href="#">Diuris drummondii</a> Tall Donkey orchid 4365	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Diuris micrantha</a> Dwarf Beeorchid 55082	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Diuris purdiei</a> Purdie's Donkeyorchid 12950	Endangered	Species or species habitat may occur within area
<a href="#">Drakaea elastica</a> Glossyleafed hammer orchid, Glossyleafed hammer orchid, Warty hammer orchid 16753	Endangered	Species or species habitat likely to occur within area
<a href="#">Drakaea micrantha</a> Dwarf hammerorchid 56755	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Lambertia echinata subsp. occidentalis</a> Western Prickly oneysuckle 64528	Endangered	Species or species habitat may occur within area
<a href="#">Synaphea sp. Fairbridge Farm (D. Papenfus 696)</a> Selena's Synaphea 82881	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Synaphea sp. Serpentine (G.R. Brand 103)</a> 86879	Critically Endangered	Species or species habitat may occur within area
<a href="#">Synaphea stenoloba</a> Dellingup Synaphea 66311	Endangered	Species or species



Name	Status	Type of Presence
		habitat may occur <input type="checkbox"/> within area

Listed Migratory Species [Resource Information](#)

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

Name	Threatened	Type of Presence
------	------------	------------------

**Migratory Marine Birds**

[Apus pacificus](#)

Forktailed Swift 678

Species or species habitat likely to occur  within area

**Migratory Terrestrial Species**

[Motacilla cinerea](#)

Grey Wagtail 642

Species or species habitat may occur  within area

**Migratory Wetlands Species**

[Actitis hypoleucos](#)

Common Sandpiper 59309

Species or species habitat may occur  within area

[Calidris acuminata](#)

Sharptailed Sandpiper 874

Species or species habitat may occur  within area

[Calidris canutus](#)

Red knot, knot 855

Endangered

Species or species habitat may occur  within area

[Calidris ferruginea](#)

Curlew Sandpiper 856

Critically Endangered

Species or species habitat may occur  within area

[Calidris melanotos](#)

Pectoral Sandpiper 858

Species or species habitat may occur  within area

[Numenius madagascariensis](#)

Eastern Curlew, Far Eastern Curlew 847

Critically Endangered

Species or species habitat may occur  within area

[Pandion haliaetus](#)

Osprey 952

Species or species habitat may 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
------	------------	------------------

**Birds**

[Actitis hypoleucos](#)

Common Sandpiper 59309

Species or species habitat may occur  within area

[Apus pacificus](#)

Forktailed Swift 678

Species or species habitat likely to occur  within area

[Ardea alba](#)

Great Egret, White Egret 59541

Breeding known to occur  within area

[Ardea ibis](#)

Cattle Egret 59542

Species or species habitat may occur  within area

Name	Threatened	Type of Presence
<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 may 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="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle 943		Species or species habitat likely to 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="#">Pandion haliaetus</a> Osprey 952		Species or species habitat may occur within area
<a href="#">Rostratula benghalensis sensu lato</a> Painted Snipe 889	Endangered	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

Name	Status	Type of Presence
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
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
Lepus 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, Calap, 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 Buffelgrass, Black Buffelgrass 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 Flaxleaved Broom, Mediterranean Broom, Flax Broom 2800		Species or species habitat likely to occur

Name	Status	Type of Presence
Genista sp. □ Genista monspessulana Broom 67538□		□ithin area  Species or species habitat may occur □ithin area
□lea europaea □live, Common □live 9160□		Species or species habitat may occur □ithin area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine 20780□		Species or species habitat may occur □ithin area
Rubus fruticosus aggregate Blackberry, European Blackberry 68406□		Species or species habitat likely to occur □ithin area
Sali□ spp. e□cept S.babylonica, S.□calodendron □ S.□reichardtii Willo□s e□cept Weeping Willo□, Pussy Willo□ and Sterile Pussy Willo□ 68497□		Species or species habitat likely to occur □ithin area
Solanum elaeagnifolium Silver Nightshade, Silver□eaved Nightshade, White □orse Nettle, Silver□eaf Nightshade, Tomato Weed, White Nightshade, Bull□ettle, Prairie□erry, Satansbos, Silver□eaf Bitter□apple, Silverleaf□ettle, Trompillo 12323□		Species or species habitat likely to occur □ithin 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 (MAENT or BICM 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 100 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, 100 or 250 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

33.35572 115.72333



# 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**

## **HABITAT TREE DETAILS**

**Habitat Trees DBH >50cm**

**Datum - GDA94**

**Entrance Size Ranges - Small = >5cm, Medium = 5, 10cm, Large = >10cm**

Waypoint Number	Zone	mE	mN	Side of Road	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow
wpt001	50H	382002	6308417	North	Jarrah	15-20	>50	0				
wpt005	50H	381926	6308457	North	Jarrah	15-20	>50	0				
wpt006	50H	381871	6308483	North	Marri	20+	>50	0				
wpt007	50H	381869	6308483	North	Marri	15-20	>50	0				
wpt008	50H	381859	6308493	North	Marri	15-20	>50	0				
wpt009	50H	381852	6308492	North	Marri	15-20	>50	0				
wpt010	50H	381849	6308493	North	Marri	15-20	>50	0				
wpt011	50H	381846	6308494	North	Marri	15-20	>50	0				
wpt013	50H	381818	6308510	North	Dead Marri	15-20	>50	0				
wpt014	50H	381809	6308516	North	Marri	15-20	>50	0				
wpt015	50H	381785	6308526	North	Marri	15-20	>50	0				
wpt016	50H	381578	6308541	South	Marri	15-20	>50	0				
wpt017	50H	381559	6308532	South	Marri	15-20	>50	0				
wpt018	50H	381559	6308535	South	Marri	15-20	>50	0				
wpt019	50H	381564	6308535	South	Marri	15-20	>50	2+	Small-Medium	No Signs	No Signs	No
wpt020	50H	381556	6308535	South	Marri	15-20	>50	0				
wpt021	50H	381565	6308553	South	Marri	15-20	>50	0				
wpt022	50H	381417	6308545	South	Marri	10-15	>50	1	Medium	No Signs	No Signs	No
wpt023	50H	381414	6308546	South	Jarrah	15-20	>50	0				
wpt024	50H	381247	6308544	South	Marri	15-20	>50	0				
wpt025	50H	381248	6308546	South	Marri	20+	>50	2+	Small-Medium	No Signs	No Signs	No
wpt026	50H	381152	6308539	South	Marri	15-20	>50	0				
wpt027	50H	381144	6308555	South	Marri	15-20	>50	0				

Waypoint Number	Zone	mE	mN	Side of Road	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow
wpt028	50H	381116	6308550	South	Marri	15-20	>50	0				
wpt029	50H	381083	6308547	North	Marri	15-20	>50	0				
wpt030	50H	381073	6308551	South	Marri	15-20	>50	0				
wpt031	50H	381071	6308546	North	Dead Jarrah	15-20	>50	2+	Small-Medium	No Signs	No Signs	No
wpt032	50H	380881	6308495	North	Marri	15-20	>50	0				
wpt033	50H	380836	6308466	South	Marri	20+	>50	0				
wpt034	50H	380850	6308471	South	Marri	20+	>50	0				
wpt035	50H	380860	6308470	South	Marri	15-20	>50	0				
wpt036	50H	380868	6308472	South	Marri	15-20	>50	0				
wpt037	50H	380890	6308481	South	Marri	15-20	>50	0				
wpt038	50H	380904	6308487	South	Marri	15-20	>50	0				
wpt039	50H	380915	6308493	South	Marri	15-20	>50	0				
wpt040	50H	380954	6308518	North	Marri	15-20	>50	0				
wpt041	50H	380968	6308517	North	Marri	20+	>50	0				
wpt042	50H	380985	6308526	North	Marri	15-20	>50	0				
wpt043	50H	381026	6308542	North	Marri	15-20	>50	0				
wpt044	50H	381025	6308542	North	Marri	15-20	>50	0				
wpt045	50H	381035	6308546	North	Marri	15-20	>50	0				
wpt046	50H	381054	6308548	North	Marri	15-20	>50	0				
wpt047	50H	380495	6308447	South	Flooded Gum	15-20	>50	2+	Small	Bees	No Signs	No

## **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.

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