

## APPENDIX 6

### TERRESTRIAL FAUNA ASSESSMENTS

- 6A: FAUNA ASSESSMENT
- 6B: HABITAT TREE REVIEW REPORT

## APPENDIX 6A

### FAUNA ASSESSMENT

# Fauna Assessment



## Yalyalup Mineral Sands Project

Doral Mineral Sands Pty Ltd

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V5

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# TABLE OF CONTENTS

## SUMMARY

1.	INTRODUCTION .....	1
2.	SCOPE OF WORKS.....	1
3.	METHODS.....	2
3.1	POTENTIAL FAUNA INVENTORY - LITERATURE REVIEW.....	2
3.1.1	Database Searches .....	2
3.1.2	Previous Fauna Surveys in the Area.....	2
3.1.3	Existing Publications .....	3
3.1.4	Fauna of Conservation Significance .....	5
3.1.5	Invertebrate Fauna of Conservation Significance .....	6
3.1.6	Likelihood of Occurrence – Fauna of Conservation Significance .....	7
3.1.7	Taxonomy and Nomenclature .....	8
3.2	SITE SURVEYS.....	8
3.2.1	Fauna Habitat Assessment.....	8
3.2.2	Opportunistic Fauna Observations.....	9
3.2.3	Western Ringtail Possum Assessment .....	9
3.2.3.1	Daytime Survey.....	9
3.2.3.2	Night Time Survey .....	9
3.2.3.3	Habitat Assessment .....	9
3.2.4	Black Cockatoo Habitat Assessment .....	9
3.2.4.1	Black Cockatoo Breeding Habitat .....	10
3.2.4.2	Black Cockatoo Foraging Habitat.....	11
3.2.4.3	Black Cockatoo Roosting Habitat.....	12
3.2.5	Other Species of Conservation Significance.....	12

4.	SURVEY CONSTRAINTS .....	12
5.	RESULTS .....	13
5.1	POTENTIAL FAUNA INVENTORY – LITERATURE REVIEW .....	13
5.2	SITE SURVEYS .....	14
5.2.1	Fauna Habitat Assessment .....	14
5.2.2	Opportunistic Fauna Observations.....	18
5.2.3	Western Ringtail Possum Assessment .....	18
5.2.3.1	Daytime Survey.....	18
5.2.3.2	Night Time Survey .....	19
5.2.3.3	Habitat Assessment .....	19
5.2.4	Black Cockatoo Habitat Assessment .....	19
5.2.4.1	Black Cockatoo Habitat Tree Assessment.....	19
5.2.4.2	Black Cockatoo Foraging Habitat Assessment .....	21
5.2.4.3	Black Cockatoo Roosting Habitat Assessment .....	23
5.2.5	Other Species of Conservation Significance .....	24
5.3	FAUNA INVENTORY – SUMMARY .....	24
5.3.1	Vertebrate Fauna .....	24
5.3.2	Vertebrate Fauna of Conservation Significance.....	25
5.3.3	Invertebrate Fauna of Conservation Significance .....	26
6.	FAUNA VALUES .....	27
6.1	CONSERVATION SIGNIFICANCE OF THE SUBJECT SITE.....	27
6.2	VALUE OF THE SUBJECT SITE AS AN ECOLOGICAL LINKAGE/WILDLIFE CORRIDOR.....	27
7.	POTENTIAL IMPACTS OF DEVELOPMENT .....	28
8.	CONCLUSION.....	30
9.	BIBLIOGRAPHY .....	32

## **TABLES**

TABLE 1:	Main Fauna Habitats within the Subject Site
TABLE 2:	Summary of Potential Black Cockatoo Breeding Habitat Trees
TABLE 3:	Documented Black Cockatoo Foraging Species Recorded within the Subject Site
TABLE 4:	Black Cockatoo Foraging Evidence Examples
TABLE 5:	Summary of Potential Vertebrate Fauna Species (as listed in Appendix B)
TABLE 6:	Likelihood of Occurrence and Possible Impacts – Fauna Species of Conservation Significance

## **FIGURES**

FIGURE 1:	Subject Site & Surrounds
FIGURE 2:	Subject Site - Air Photo
FIGURE 3:	Fauna Habitats/Vegetation Units (Modified from Ecoedge 2016)
FIGURE 4:	Possum Observations (2017)
FIGURE 5:	Possum Observations (2019)
FIGURE 6:	Habitat Trees (DBH $\geq$ 50cm)

## **APPENDICES**

APPENDIX A:	Conservation Categories
APPENDIX B:	Observed and Potential Vertebrate Fauna Listing
APPENDIX C:	DBCA NatureMap & Protected Matters Search Tool Results
APPENDIX D:	Habitat Tree Details
APPENDIX E:	Significant Species Profiles

**Acronyms/Abbreviations:**

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

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

**BC Act:** Biodiversity Conservation Act 2016. 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.

**DMIRS:** Department of Mines, Industry Regulation and Safety (formerly DMP, DOIR), WA Government.

**DMP:** Department of Mines and Petroleum (now DMIRS), WA Government.

**DoE:** Department of Environment (now DWER/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 DMIRS), 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 Doral Mineral Sands Pty Ltd's (Doral) Yalyalup Mineral Sands Project (the subject site) (Figures 1 and 2). The subject site contains an identified mineral sand resource which Doral are proposing to mine

The proposal has a total disturbance area of ~372.67ha within a development envelope of about 894.17ha. The proposed mine pits have a disturbance area of ~334.32ha and associated infrastructure has a disturbance of ~38.35ha. The majority of the disturbance area (~371ha) is located on previously cleared farmland currently used for beef cattle, dairy cattle and pasture, with the remaining ~1.67ha occurring within degraded native vegetation.

The proposal has been referred to the federal DotEE (EPBC 2017/8094) and determined to be a controlled action under the *EPBC Act* and will be assessed by accredited assessment under Part IV of the state *EP Act* by the EPA.

The fauna assessment reported on here will be used to guide ongoing planning and to facilitate state and federal government approvals as indicated above.

The fauna assessment has been carried out in two phases, the first in 2017 and the second in 2019. The assessment has involved a literature review and a series of day and night time surveys included targeted surveys for western ringtail possums and black cockatoo habitat.

### **Key Findings**

- Almost all the subject site (~95%) has been totally cleared or almost totally cleared of native vegetation for livestock grazing (Figure 3). These areas contain only pasture grasses with the occasional widely spaced, scattered trees remaining. Parts of the subject site have been planted with non-endemic/exotic tree species to act as wind breaks. Native remnant vegetation is mostly confined to road verges and along two small, seasonally inundated creek lines, one being a minor tributary of the Sabina River and the other the Abba River. Most of this vegetation is dominated by woodlands containing various densities of marri, jarrah and/or flooded gum with or without midstorey species such as peppermint, paperbark or banksia. Almost all the native vegetation present is in a completely degraded condition (Ecoedge 2016).

Overall fauna habitat values within the subject site have been severely compromised by the almost total removal of native vegetation. Most areas lack any natural attributes and are now only likely to be utilised by generally common and widespread fauna species with non-specific requirements which allow them to persist in highly disturbed habitats.

As a consequence, the fauna biodiversity of the subject site is well below levels present prior to historical disturbance having occurred and can therefore be regarded as highly depauperate. The overall fauna assemblage can therefore be regarded as highly unlikely to be of local or regional significance.

The two seasonal creek systems which pass through the subject site also have very low fauna values given their long history of disturbance. This is primarily a consequence of total or partial clearing of vegetation from their banks, modification of the creek line path in some sections and the fact they have been or are open to ongoing access by livestock which has further degraded the habitat and water quality compared to that originally present.

- With respect to native vertebrate fauna, 11 mammals (includes eight bat species), 77 bird, 13 reptile and eight frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the subject area at times. Nine species of introduced/domestic animals may also frequent the area.

Of the 109 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. No migratory or priority listed fauna species are considered likely to occur.

A total of 52 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 (~48% of potential species). Five introduced/domestic species were also recorded.

- The daytime western ringtail possum observations from the 2017 and 2019 surveys are shown in Figure 4 and 5 respectively. In total six WRP dreys were observed during the day survey in 2017 and three in 2019. All dreys were recorded in a short section of habitat at the northern end of McGibbon Track. A small number of WRPs scats were also observed in close proximity to some dreys during both surveys.

The nocturnal survey observations from the 2017 and 2019 surveys are shown in Figure 4 and 5 respectively. Five WRPs and six common brushtail possums were recorded during the 2017 survey. In contrast only one WRP and two common brushtail possums were recorded during the 2019 survey. As with the day survey all the WRP observations were made along the northern section of the McGibbon Track.

WRP observations made during both survey periods were all recorded within vegetation bordering the McGibbon Track. This area is characterised by having good midstorey canopy connectivity and a range of plant species known to be fed upon by WRPs (e.g. jarrah, marri, peppermint, Christmas tree, *Acacia saligna*).

The vegetation along the northern section of the creek line in the west of the subject site also appears to represent potential WRPs habitat given the prevalence of peppermint in this area, though no evidence of the species presence was found during the day or night surveys.

The current development plan will not require the removal of any of the identified WRP habitat present within the subject site.

- The black cockatoo breeding habitat assessment identified a total of 1,052 trees with a DBH of  $\geq 50$ cms ( $\geq 30$ cm for wandoo) within the subject site (Figure 6). It should be noted that the majority of the currently identified habitat trees are not inside the proposed works footprint and will therefore not be affected.

Forty three trees appeared to contain hollows possibly suitable for black cockatoos to use for nesting though no conclusive evidence of this actually having taken place was seen. As indicated, most of these trees will be avoided in any event.

The subject site contains a range of plant species known to be utilised by black cockatoos as foraging habitat but the total resource is relatively small given the area is largely cleared. A small amount of evidence of black cockatoos foraging was observed during the field survey in the form of chewed marri fruits and pine cones. This evidence was attributed to one of the three black cockatoo species depending on the plant species involved and the characteristics of the foraging activity.

No evidence of black cockatoo roosting in trees located within the subject site was observed during the field reconnaissance survey.

- In summary, four vertebrate fauna species of conservation significance were positively identified as utilising the subject site for some purpose during the survey period, these being:
  - Carnaby's Black-Cockatoo *Calyptorhynchus latirostris* – S2 (BC Act), Endangered (EPBC Act)
  - Baudin's Black-Cockatoo *Calyptorhynchus baudinii* – S2 (BC Act), Endangered (EPBC Act)
  - Forest Red-tailed Black-Cockatoo *Calyptorhynchus banksii naso* – S3 (BC Act), Vulnerable (EPBC Act).
  - Western Ringtail Possum *Pseudocheirus occidentalis* – S1 (BC Act), Critically Endangered (EPBC Act)

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

This species is:

- Peregrine Falcon *Falco peregrinus* – S7 (BC Act)
- Two conservation significant invertebrate species appeared in the DBCA NatureMap database search, the Swan Coastal Plain shield-backed trapdoor spider and Carter's freshwater mussel. Neither species are considered likely to frequent the subject site primarily due to a lack of suitable (type, quality and/or extent) habitat.

- No other fauna species of conservation significance are considered likely to occur. This includes migratory waders which would not utilise the site due to a lack of suitable habitat. The closest, most significant area of migratory shorebird habitat is represented by the Vasse – Wonnerup Estuary situated about 8km north west of the subject site. The two seasonal creek lines which pass through the subject site ultimately drain into this water body. It is considered extremely unlikely that any of the activities proposed at the mine site will have any impact the Vasse – Wonnerup Estuary or the migratory shorebirds which frequent it.
- It is understood that any future development at the subject site will be largely confined to existing cleared areas with the main clearing required being a small number of scattered paddock trees. Based on this information, no direct, substantial impacts on any fauna species or existing biodiversity values are anticipated. In cases where some impact does occur it is only expected to be very low/negligible. This coupled with the fact that most of the species known to or likely to occur are common and widespread, no overall change in their conservation status is considered likely.

## 1. INTRODUCTION

This report details the results of a fauna assessment of Doral Mineral Sands Pty. Ltd.'s (Doral) Yalyalup Mineral Sands Project (the subject site). The subject site is situated about 11 km south east of Busselton in south west Western Australia (Figure 1). The subject site contains an identified mineral sand resource which Doral are proposing to mine.

The proposal has a total disturbance area of ~372.67ha within a development envelope of about 894.17ha. The proposed mine pits have a disturbance area of ~334.32ha and associated infrastructure has a disturbance of ~38.35ha. The majority of the disturbance area (~371ha) is located on previously cleared farmland currently used for beef cattle, dairy cattle and pasture, with the remaining ~1.67ha occurring within degraded native vegetation. The native vegetation which remains is mainly located along road reserves and drainage lines or is represented by widely scattered trees in cleared paddock areas (Figure 2).

The proposal has been referred to the federal DotEE (EPBC 2017/8094) and determined to be a controlled action under the *EPBC Act* and will be assessed by accredited assessment under Part IV of the state *EP Act* by the EPA.

The fauna assessment reported on here represents one of several technical reports that will be used to provide an understanding of the suite of environmental values present within the subject site. The information presented will be used to guide ongoing planning and to facilitate state and federal government approvals as indicated above.

## 2. SCOPE OF WORKS

The scope of works was to conduct a Level 1 fauna survey as defined by the EPA (EPA 2016). Because the general area is known to be utilised by western ringtail possums and black cockatoos the scope of the survey work was expanded to include a baseline 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 day and night searches for western ringtail possum habitat/site use (foraging, refuge and dispersal habitat and individuals);
3. Black cockatoo habitat/site use assessment (breeding habitat trees, foraging and roosting habitat);
4. Identify and discuss any other potentially occurring significant fauna species and their habitat; and
5. Report summarising results, methods and conclusions.

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

## **3. METHODS**

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

#### **3.1.1 Database Searches**

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

- DBCA's NatureMap database search (combined data from DBCA's, WAM, BA, ALA 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 certain fauna species have become locally or regionally extinct.

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

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

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

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

- Bamford, M.J and A.R. (2000). Proposed Gwindinup Mineral Sands Mine. Fauna Surveys; August and December 1999. Unpublished report for Cable Sands WA. January 2000.

- Bamford, M. and A. (2001). Fauna Survey of the Ludlow Mining Lease. Final Report. Unpublished report for Cable Sands (WA) Pty Ltd. November 2001.
- Bancroft, W. and Bamford, M. (2008). Fauna values of Bemax's Happy Valley mineral sands deposit. Unpublished report for Bemax Resources Limited. January 2008.
- Biologic (2014). Wonnerup North Vertebrate Fauna Assessment. Unpublished report for Cristal Mining Australia Ltd. April 2014.
- Biota (2009). Tutunup Fauna Assemblage and Fauna Habitat Seasonal Survey. Unpublished report for Iluka Resources. March 2009.
- Biota (2007a). Yoganup 215 Strand Fauna and Faunal Assemblage Survey. Unpublished report for Iluka Resources. February 2007.
- Biota (2007b). Tutunup South Fauna Habitat and Fauna Assemblage Seasonal Survey. Unpublished report for Iluka Resources. December 2007.
- Harewood, G. (2009). Western Ringtail Possum Baseline Assessment. Tutunup. Unpublished report for Iluka Resources. August 2009.
- Harewood, G. (2012). Phase 1 and 2 Seasonal Fauna Surveys (Level 2). Yoongarillup Mineral Sands Project. Unpublished report for Doral Mineral Sands Pty Ltd.
- Harewood, G. (2013). Fauna Assessment of Yoganup Extended. Unpublished report for Iluka Resources Ltd.
- Hart, Simpson and Assoc. (1997). Wonnerup -Tutunup Road - Vertebrate Fauna. Unpublished report for Westralian Sands Ltd.
- Ninox (2006). A Vertebrate Fauna Assessment of the Yoganup Mineral Sands Project Area. Unpublished report for Iluka Resources. March 2006.

As with the database 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.
- Bush, B., Maryan, B., Browne-Cooper, R. & Robinson, D. (2010). Field Guide to Reptiles and Frogs of the Perth Region. UWA Press, Nedlands.
- Churchill, S. (2008). Australian Bats. Second Edition, Allen & Unwin.
- Cogger, H.G. (2014). Reptiles and Amphibians of Australia. 7th Edition. CSIRO Publishing.
- Johnstone, R.E. and Storr, G.M. (1998). Handbook of Western Australian Birds: Volume 1 – Non-passerines (Emu to Dollarbird). Western Australian Museum, Perth Western Australia.
- Johnstone, R.E. and Storr, G.M. (2004). Handbook of Western Australian Birds: Volume 2 – Passerines (Blue-winged Pitta to Goldfinch). Western Australian Museum, Perth Western Australia.
- Menkhorst, P. and Knight, F. (2011). A Field Guide to the Mammals of Australia. Oxford University Press, Melbourne.
- Morgan, D.L., Beatty, S.J., Klunzinger, M.W, Allen, M.G. and Burnham, Q.E (2011). Field Guide to the Freshwater Fishes, Crayfishes and Mussels of South Western Australia. Published by SERCUL.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1983). Lizards of Western Australia II: Dragons and Monitors. WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1990). Lizards of Western Australia III: Geckos and Pygopods. WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1999). Lizards of Western Australia I: Skinks. Revised Edition, WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (2002). Snakes of Western Australia. Revised Edition, WA Museum, Perth.
- Tyler M.J. & Doughty P. (2009). Field Guide to Frogs of Western Australia, Fourth Edition, WA Museum, Perth.
- Van Dyck, S., Gynther, I. & Baker, A. Eds (2013). Field Companion to The Mammals of Australia. Queensland Museum.



- Wilson, S. and Swan, G. (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 1950 (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 2019b).

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 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 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.

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

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

The three categories used for birds within the Bush Forever documents are:

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

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

### **3.1.5 Invertebrate Fauna of Conservation Significance**

For this assessment, the review of potential conservation significant invertebrates has been limited to those listed by the DBCA and *EPBC Act* database searches (which rely on distribution records and known habitat preferences).

A targeted SRE survey was not undertaken as it was considered unwarranted. At Yalyalup the area of proposed ground disturbing activity is almost totally cleared of native vegetation and unlikely to represent habitat suitable for SREs. The small areas of remnant vegetation/habitat in adjoining areas would have once been widespread/continuous and there are no apparent geomorphological boundaries or subdivisions that would have represented species isolators prior to clearing. Invertebrate species utilising these areas would therefore be unlikely to have distributions totally restricted to the Project area.

It should also be noted that the Swan Coastal Plain as a whole has a limited occurrence of species considered to be short range endemics (Invertebrate Solutions 2018). Targeted surveys for SREs have not been undertaken at any of the nearby mineral sand mines on the southern Swan Coastal Plain in the past (e.g., Yoongarillup, Wonnerup, Wonnerup South,

Wonnerup North, Yoganup, Yoganup Extended, Yoganup 215, Tutunup South, Tutunup, Happy Valley, Gwindinup and Ludlow). Where invertebrates have been collected during general fauna surveys at these sites as bycatch none have been identified as being SREs (Harewood 2012, Biota 2007a, Biota 2007b, Biota 2009).

### **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 20km 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 and adjoining southern forest regions. 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 a population or part population of 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.

### **3.1.7 Taxonomy and Nomenclature**

Taxonomy and nomenclature for 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 (2013), Van Dyck & Strahan (2013), Christidis and Boles (2008), Bush *et al.* (2010), Bush *et al.* (2007), Tyler *et al.* (2009), and Glauret (1961). Not all common names are generally accepted.

## **3.2 SITE SURVEYS**

The fauna assessment has been carried out in two phases, the first in 2017 and the second in 2019. In 2017 daytime field survey work at the subject site was carried out on the 28 June and the 17 August. A nocturnal survey was completed on the 29 June 2017.

In 2019 daytime field survey work at the subject site was carried out over a number of days in July, August and October. A nocturnal survey was completed on the 29 July 2019. All survey work was done by Greg Harewood (Zoologist).

It should be noted that one private property ("Mitchells Block") which falls within the project boundary will not be directly accessed due to permissions not being forthcoming. The small area of remnant vegetation within this property is comprised of a highly degraded flooded gum woodland bordering a creek line. As with other sections of the creek line in adjoining properties the vegetation has low fauna habitat values.

### **3.2.1 Fauna Habitat Assessment**

Vegetation units identified during the flora and vegetation survey, carried out by Ecoedge (Ecoedge 2016), have been used to define broad fauna habitat types across the subject site. This information has been supplemented with observations made during the fauna survey.

The main aim of this facet of the assessment was to determine if it was likely that any species of conservation significance would be utilising the subject site based on the presence of suitable habitat. The habitat information obtained was also used to aid in finalising the overall potential fauna list.

As part of the literature review, available information on the habitat requirements of the species of conservation significance listed as possibly occurring in the area was researched.

During the field survey the habitats within the 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 Opportunistic Fauna Observations**

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

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

As a minimum the western ringtail possum survey has followed relevant guidelines for survey for the species as recommended in “Survey guidelines for Australia’s threatened mammals” (Department of Sustainability, Environment, Water, Population and Communities 2011). As outlined in the guidelines the survey has included various detailed daytime and night time surveys and a habitat assessment additional details of which are provided below.

#### **3.2.3.1 Daytime Survey**

Day time surveys to locate and record dreys, obvious tree hollows, scats and individual WRPs were carried concurrent with the general fauna assessment/black cockatoo habitat assessment and involved the examination of all vegetation where access was available within the subject site. The assessment included the examination of almost every tree and areas containing large shrubs within the subject site. In total about 28km of transects were completed over several days.

#### **3.2.3.2 Night Time Survey**

Nocturnal surveys were carried out to provide an estimate of the distribution and abundance of WRPs in areas of potential habitat identified during the daytime survey. Survey work was carried out on foot using a LED head torch. In total about 12km of transects were completed over several nights.

#### **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 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.

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

The black cockatoo breeding habitat assessment identified all suitable breeding tree species within the subject site that have a Diameter at Breast Height (DBH) equal to or greater than 50cm ( $\geq 30$ cm for wandoo). The DBH of each tree was estimated using a pre-made 50 cm “caliper” (30cm for wandoo).

Target tree species included marri, jarrah, tuart, wandoo and flooded gum and any other *Corymbia/Eucalyptus* species of a suitable size that was present. Peppermints, *Banksia*, sheoak and melaleuca tree species (for example) were not assessed as they typically do not develop hollows used by black cockatoos.

The location of each tree identified over the threshold DBH was recorded with a GPS and details of 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.

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

- Small =  $\sim < 5$ cm 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 hollow appears unsuitable for nesting i.e. wrong orientation, appears too small, too low or too shallow); or
- Large (cockatoo) = ~>10cm diameter (entrance appears big enough for a black cockatoo to use for nesting).

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

- Tree <50cm DBH or an unsuitable species (these were not assessed/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 black cockatoo nest hollow was defined as:

*Generally, any tree which is alive or dead that contains one or more hollows or possible hollows (cavities within the trunk or branches) suitable for occupation by black cockatoos for the purpose of nesting/breeding. Hollows or apparent 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 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). Where considered warranted a drone (DJI Mavic Air) was used to examine potential hollows in more detail.

A review of available literature was also carried out to determine the location/extent of any known/likely black cockatoo breeding habitat in the vicinity.

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

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



A review of available literature was carried out to determine the location/extent of any known/likely black cockatoo foraging habitat areas in the vicinity of the survey area.

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

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

A review of available literature was carried out to determine the location/extent of any known/likely black cockatoo roosting habitat areas in the vicinity of the survey area.

#### **3.2.5 Other Species of Conservation Significance**

Evidence of the presence or likely presence of other species of conservation significance (including suitable habitat) was searched for and recorded concurrent with the WRP/black cockatoo assessments. The aim was to obtain sufficient information to make a definitive comment on the likely significance of the subject site to other species of conservation significance which may be present.

### **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 subject 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 within the subject site 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 subject site.

The habitat requirements and ecology of many of the species known to occur in the wider area are often not well understood or documented. It can therefore be difficult to exclude



species from the potential list based on a lack of a specific habitat or microhabitat within the 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.

At the time of the survey work access to one of the private properties (“Mitchell’s Block”) which is not subject to any proposed clearing activities was restricted. The vast majority of native vegetation within the subject site is however located in road reserves and therefore this was not, for the purpose of this assessment, seen as a major limitation.

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.

## **5. RESULTS**

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

A list of 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 species listing as are the DBCA NatureMap database search results. Species considered unlikely to occur with the subject site but previously recorded in other surveys and/or which appear in the DBCA database search have been excluded from the list. 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/regionally extinct and secondly that suitable habitat for each species, as identified during the habitat assessment, is present within the subject site. Compiling an accurate fauna list has limitations (see Section 4 above) and therefore the listing is likely to be an overestimation of the fauna species actually present within the subject site at any one time.

With respect to native vertebrate fauna, 11 mammals (includes eight bat species), 77 bird, 13 reptile and eight frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the subject area at times. Nine species of introduced/domestic animals may also frequent the area.

Of the 109 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. No migratory or priority listed fauna species are considered likely to occur.

## 5.2 SITE SURVEYS

### 5.2.1 Fauna Habitat Assessment

The subject site is located in the southern section of the Swan Coastal Plain. The Swan Coastal Plain (SWA) was classified as part of the Interim Biogeographical Regionalisation for Australia and is in broad terms described as a:

*“Low lying coastal plain mainly covered with Woodlands. It is dominated by Banksia or Tuart on sandy soils, Allocasuarina obesa on outwash plains, and paperbark in swampy areas. In the east, the plain rises to duricrusted Mesozoic sediments dominated by Jarrah Woodland. Warm Mediterranean. Three phases of marine sand dune development provide relief. The outwash plains, once dominated by A. obesa – Marri Woodlands and Melaleuca shrublands, are extensive only in the south.”* (Thackway and Cresswell, 1996; IBRA, 2000).

The subject site itself is within a further defined subregion of the SWA referred to as the Swan Coastal Plain subregion or the Perth subregion (SWA2). This is defined as:

*“Colluvial and aeolian sands, alluvial river flats, coastal limestone. Heath and/or Tuart woodlands on limestone, Banksia and Jarrah - Banksia woodlands on Quaternary marine dunes of various ages, Marri on colluvial and alluvials. Includes a complex series of seasonal wetlands and also includes Rottnest, Carnac and Garden Islands etc. Rainfall ranges between 600 and 1000 mm annually and the climate is Mediterranean”. The subregion has an area of about 1, 333,900 ha (Mitchell et al. 2002).*



Almost all the subject site (~95%) has been totally cleared or almost totally cleared of native vegetation for livestock grazing. These areas contain only pasture grasses with the occasional widely spaced, scattered trees remaining. Parts of the subject site have been planted with non-endemic/exotic tree species to act as wind breaks. Native remnant vegetation is mostly confined to road verges and along two small seasonally inundated creek lines, one being a minor tributary of the Sabina River and the other the Abba River. Most of this vegetation is dominated by woodlands containing various densities of marri, jarrah and/or flooded gum with or without midstorey species such as peppermint, paperbark or banksia. Almost all the native vegetation present is in a completely degraded condition (Ecoedge 2016).

The subject site is almost flat with little topographical expression. Soils onsite vary from a coarse grey sand (thin layer of Bassendean Sand) on slightly raised areas to grey-brown loamy sand/sandy clay (Guildford Formation) on flats. An area of ironstone (formed by the cementation of soil) occurs in the eastern section of the subject site. Because of the loamy/clayey nature of the soils, low lying areas become waterlogged/partially inundated during the wetter months of the year.




Descriptions and example images of the main fauna habitats/dominant vegetation present within the subject site are provided in Table 1. The location and extent of each of the identified habitat/vegetation units is shown in Figure 3 (modified from EcoEdge 2016).




Overall fauna habitat values within the subject site have been severely compromised by the almost total removal (~95%) of native vegetation. Most areas lack any natural attributes and are now only likely to be utilised by generally common and widespread fauna species with non-specific requirements which allow them to persist in highly disturbed habitats. As a consequence, the fauna biodiversity of the subject site is well below levels present prior to historical disturbance having occurred and can therefore be regarded as highly depauperate. The overall fauna assemblage can therefore be regarded as highly unlikely to be of local or regional significance.

**Table 1: Main Fauna Habitats within the Subject Site**


Unit	Fauna Habitat Description	Example Image
A1	Woodland of <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> , with scattered <i>Agonis flexuosa</i> , <i>Banksia attenuata</i> , <i>B. grandis</i> , <i>Melaleuca preissiana</i> , <i>Nuytsia floribunda</i> , <i>Persoonia longifolia</i> or <i>Xylomelum occidentale</i> over <i>Xanthorrhoea preissii</i> over weeds on grey-brown or grey loamy sand or sand (on farmland usually only <i>C. calophylla</i> and <i>E. marginata</i> are present).  Total Area = ~10.2 ha (1.04%)	
A2	Woodland of <i>C. calophylla</i> (sometimes with <i>E. marginata</i> or <i>E. rudis</i> ) with scattered <i>M. preissiana</i> or <i>B. littoralis</i> over open shrubland that may include <i>Acacia extensa</i> , <i>A. saligna</i> , <i>Hakea ceratophylla</i> , <i>H. lissocarpha</i> , <i>H. prostrata</i> , <i>H. varia</i> , <i>Kingia australis</i> , <i>M. viminea</i> and <i>X. preissii</i> over weeds on seasonally wet grey loamy sand.  Total Area = ~4.0 ha (0.45%)	



Unit	Fauna Habitat Description	Example Image
B1	<p>Tall shrubland of <i>A. saligna</i>, <i>B. squarrosa</i> subsp. <i>argillacea</i>, <i>Calothamnus quadrifidus</i> subsp. <i>teretifolius</i>, <i>H. oldfieldii</i> and <i>Kunzea micrantha</i> (with scattered emergent <i>E. rudis</i>) over scattered native herbs including <i>Drosera glanduligera</i> and <i>Sowerbaea laxiflora</i>, the sedge <i>Loxocarya magna</i>, and weeds on shallow red sandy clay on massive ironstone.</p> <p>Total Area = ~0.5 ha (0.06%)</p>	
B2	<p>Woodland of <i>E. rudis</i> and (in some areas) <i>M. raphiophylla</i> over weeds on massive ironstone.</p> <p>Total Area = ~2.9 ha (0.33%)</p>	
C1	<p>Woodland of <i>E. rudis</i> (and sometimes <i>C. calophylla</i>) over scattered <i>A. flexuosa</i> and <i>M. raphiophylla</i> over weeds on grey-brown clayey loams in drainage lines.</p> <p>Total Area = ~19.0 ha (2.2%)</p>	

Unit	Fauna Habitat Description	Example Image
C3	<p>Tall Open Shrubland that may include <i>Acacia saligna</i>, <i>Jacksonia furcellata</i>, <i>Kingia australis</i>, <i>Melaleuca osullivanii</i>, <i>M. preissiana</i>, <i>M. viminea</i> and <i>Xanthorrhoea preissii</i> on seasonally wet grey-brown sandy loam.</p> <p>Total Area = ~0.55 ha (0.06%)</p>	
Planted	<p>Planted non-endemic and exotic trees.</p> <p>Total Area = ~5.5 ha (0.62%)</p>	
N/A	<p>Existing cleared/highly degraded areas (e.g. paddocks/road verges) with scattered trees/shrubs (including planted non-endemics). Some areas seasonally inundated / waterlogged.</p> <p>Total Area = ~852.9 ha (95.38%)</p>	



Unit	Fauna Habitat Description	Example Image
N/A	Seasonal creek and drains (including minor tributaries of the Sabina River and a section of the Abba River)	

The two seasonal creek systems which pass through the subject site also have very low fauna values given their long history of disturbance. This is primarily a consequence of total or partial clearing of vegetation from their banks, modification of the creek line path in some sections and the fact they have been or are open to ongoing access by livestock which has further degraded the habitat and water quality compared to that originally present.

Despite this, some of the vegetation remaining within the subject site still represents suitable habitat for some species of conservation significance in particular a small population of western ringtail possums (see section 5.2.3). The sites overall value to conservation significant species can however be regarded as being low given the extent of native vegetation is limited. It should be noted that the majority of native vegetation is not located with the proposed development footprint and will therefore not be directly impacted upon.

## 5.2.2 Opportunistic Fauna Observations

Opportunistic fauna observations are listed in Appendix B. A total of 52 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. Five introduced/domestic species were also recorded.

## 5.2.3 Western Ringtail Possum Assessment

### 5.2.3.1 Daytime Survey

The daytime survey observations from the 2017 and 2019 surveys are shown in Figure 4 and 5 respectively. In total six WRP dreys were observed during the day survey in 2017 and three in 2019. All dreys were recorded in a short section of habitat at the northern end of McGibbon Track.

Tree hollows, forks in trees branches, subtle cavities in tree trunks, fallen hollow logs, rabbit burrows and dense ground cover are also used (to varying degrees) by WRPs for daytime refuge and therefore observations of dreys only provide a guide to WRP habitat use/quality

as other opportunities for daytime refuge may exist. A small number of WRPs scats were also observed in close proximity to some dreys during both surveys.

#### **5.2.3.2 Night Time Survey**

The nocturnal survey observations from the 2017 and 2019 surveys are shown in Figure 4 and 5 respectively. Five WRPs and six common brushtail possums were recorded during the 2017 survey. In contrast only one WRP and two common brushtail possums were recorded during the 2019 survey. As with the day survey all the WRP observations were made along the northern section of the McGibbon Track. A common brushtail possum was also recorded during the 2019 survey along the western creek line near Princefield Road.

#### **5.2.3.3 Habitat Assessment**

WRP observations made during both survey periods were all recorded within vegetation bordering the McGibbon Track. This area is characterised by having good midstorey canopy connectivity and a range of plant species known to be fed upon by WRPs (e.g. jarrah, marri, peppermint, Christmas tree, *Acacia saligna*).

The vegetation along the northern section of the creek line in the west of the subject site also appears to represent potential WRPs habitat given the prevalence of peppermint in this area, though no evidence of the species presence was found during the day or night surveys.

Some sections of other road reserve vegetation, in particular those areas which contain some midstorey vegetation (mainly in the vicinity of the creek crossings), also appear to be potentially suitable habitat for WRPs despite no evidence of their presence in these areas being found.

Other areas of vegetation which lack a strong midstorey component, including areas of planted non-endemic/exotic species can be regarded as being marginal/unsuitable for use by WRPs on a permanent basis, though some sections would represent dispersal habitat, albeit of a generally poor quality.

The current development plan will not require the removal of any of the identified WRP habitat present within the subject site.

### **5.2.4 Black Cockatoo Habitat Assessment**

#### **5.2.4.1 Black Cockatoo Habitat Tree Assessment**

Trees considered potentially suitable for black cockatoos to use as nesting habitat (subject to a suitable hollow being present or forming and a range of other factors) which were found within the subject site comprised the following species:

- Marri – *Corymbia calophylla*.
- Jarrah - *Eucalyptus marginata*.

- Flooded Gum – *Eucalyptus rudis*.
- Tuart - *Eucalyptus gomphocephala* (small number of planted specimens only).
- Wandoo – *Eucalyptus wandoo* (very small number of planted specimens only)
- Planted non endemic eucalypts (at least two species).
- Dead unidentified species (most likely marri or jarrah).

A summary of the potential black cockatoo breeding trees (using DotEE criteria i.e. any suitable tree species with a DBH  $\geq 50\text{cm}$  ( $\geq 30\text{cm}$  for wandoo) (Commonwealth of Australia 2012)) observed within the subject site is provided in Table 2 below and their location shown in Figure 6.

As indicated in Figure 6 one property could not be accessed and therefore a number of trees (mainly flooded gum) are yet to be assessed.

**Table 2: Summary of Potential Black Cockatoo Breeding Habitat Trees**

Total Number of Habitat Trees	Number of Trees with <u>No Hollows</u> Observed	Number of Trees with Hollows Considered <u>Unsuitable</u> for Nesting Black Cockatoos	Number of Trees with Hollows Considered <u>Possibly</u> Suitable for Nesting Black Cockatoos	Tree Species					
				Marri	Flooded Gum	Non-endemic Euc.	Dead Unknown	Tuart	Wandoo (DBH $> 30\text{cm}$ )
1052	893	116	43	488	304	174	44	13	2

The assessment identified a total of 1,052 trees with a DBH of  $\geq 50\text{cms}$  ( $\geq 30$  for wandoo) within the subject site. It should be noted that the majority of the currently identified habitat trees are not inside the proposed works footprint and will therefore not be affected. It is also not known if some of the unknown eucalypt species actually represent trees that would ultimately develop hollows suitable for black cockatoos.

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

The survey area falls within the mapped breeding range of Carnaby's cockatoo as depicted in the most current recovery plan produced by DBCA (Figure 2 - DPaw 2013). The DBCA recovery plan for Baudin's cockatoo and the forest red-tailed black cockatoo (DEC 2008) does not specifically define any known breeding areas for either species. Johnstone and Kirkby (2011) also do not specifically mention breeding areas of either species of black



cockatoo within the area though both are noted as utilising marri trees (and other tree species) for breeding in the south west.

While there appears to be a paucity of breeding data for the general area this could simply be a consequence of a lack of survey work or a lack of publicly available data. The author is aware of a documented forest red-tailed black cockatoo breeding event on farmland in Elgin about 25 km north east of the subject site. A review of other available data revealed several Carnaby's black cockatoo breeding records in Dalyellup and Gelorup, about 35 km distance from the subject site. Bamford (2004) also reports a breeding attempt by Carnaby's cockatoo in the Ludlow Tuart Forest in 2003 at a point about 10 km north of the survey area.

Based on available vegetation mapping it is estimated that there is approximately 13,300 ha of native vegetation within 10 km the survey area and there is therefore significant potential for breeding to take place in the wider area (assuming the presence of suitable trees).

#### 5.2.4.2 Black Cockatoo Foraging Habitat Assessment

The following represents a list of plant species recorded within the subject site by Ecoedge (2016) which are known (or highly likely) to be used by one or more of the black cockatoo species as a food source (i.e. foraging habitat).

**Table 3: Documented Black Cockatoo Foraging Species Recorded within the Subject Site**



Common Name	Species
Orange Wattle	<i>Acacia saligna</i>
Peppermint	<i>Agonis flexuosa</i>
Slender Banksia	<i>Banksia attenuata</i>
Couch Honey-pot Dryandra	<i>Banksia dallanneyi</i>
Bull Banksia	<i>Banksia grandis</i>
Swamp Banksia	<i>Banksia littoralis</i>
Pingle	<i>Banksia squarrosa</i>
Pie or Afghan Melon	<i>Citrullus lanatus (introduced)</i>
Marri	<i>Corymbia calophylla</i>
Corkscrew Grass or Storksbill	<i>Erodium botrys (introduced)</i>
Tuart	<i>Eucalyptus gomphocephala</i>
Jarra	<i>Eucalyptus marginata</i>
Flooded Gum	<i>Eucalyptus rudis</i>
Wandoo	<i>Eucalyptus wandoo</i>
Rye	<i>Hakea lasianthoides</i>
Honeybush	<i>Hakea lissocarpha</i>
Harsh Hakea	<i>Hakea prostrata</i>
Candle Hakea	<i>Hakea ruscifolia</i>
Variable-leaved Hakea	<i>Hakea varia</i>
Grey Stinkwood	<i>Jacksonia furcellata</i>



Common Name	Species
Kingia	<i>Kingia australis</i>
Snottygobble	<i>Persoonia longifolia</i>
Guildford or Onion Grass	<i>Romulea rosea</i> (introduced)
Grass tree	<i>Xanthorrhoea preissii</i>
Woody Pear	<i>Xylomelum occidentale</i>

It should be noted that the degree to which the various plant species are utilised varies considerably. For example, marri is documented as being the primary food source for all three species of black cockatoo, though jarrah and *banksia* make up a high proportion of some species diet in other areas where they proliferate. Plants such as flooded gum, woody pear and peppermint (for example) are only foraged upon rarely.

Evidence of black cockatoos foraging was observed during the field survey in the form of chewed marri fruits and pine cones. This evidence was attributed to one of the three black cockatoo species depending on the plant species involved and the characteristics of the foraging activity (i.e. bite marks). Representative examples of the foraging activity observed are shown in Table 4.

**Table 4: Black Cockatoo Foraging Evidence Examples**

Foraging Evidence Description	Example Image
Marri Fruits – foraging activity attributed to the Baudin's black cockatoo.	
Marri Fruits – foraging activity attributed to the Carnaby's black cockatoo.	

Foraging Evidence Description	Example Image
Marri Fruits – foraging activity attributed to the forest red-tailed black cockatoo.	
Jarrah Fruits – foraging activity attributed to the Baudin's or Carnaby's black cockatoo.	

The extent of quality foraging habitat within the survey area can be regarded as those areas containing marri, jarrah, banksia and to a lesser extent flooded gum. This area totals about 38 ha. Most of this vegetation does not fall within the proposed works footprint.

Based on available vegetation mapping it is estimated that there is approximately 13,300 ha of native vegetation within 10 km the survey area, much of which is very likely to represent potential black cockatoo foraging habitat of some type.

#### 5.2.4.3 Black Cockatoo Roosting Habitat Assessment

No evidence of black cockatoo roosting in trees located within the subject site was observed during the field reconnaissance survey.

It is difficult to determine if trees or groves of trees within the subject site represent potential roosting habitat as a range of factors, not all of which can be observed, determine suitability. Some of the larger trees may be suitable but as indicated no actual evidence of use was seen. A review of the 2018 Great Cocky Count database shows no documented, active roost sites within 10km of the subject site survey area (Peck *et al.* 2018).

Based on available vegetation mapping it is estimated that there is approximately 13,300 ha of native vegetation within 10 km the survey area and therefore there is significant potential for roosting habitat to be present in the wider area (assuming the presence of suitable trees).

### 5.2.5 Other Species of Conservation Significance

Besides the WRPs recorded and a small amount of foraging evidence left by Carnaby's and Baudin's black cockatoo, no direct evidence of any other species of conservation significance being present was found however based on the habitats present an additional two species are considered as potentially present though their actual status/frequency of occurrence in the subject site is uncertain (the peregrine falcon and the forest red-tailed black cockatoo).

## 5.3 FAUNA INVENTORY – SUMMARY

### 5.3.1 Vertebrate Fauna

Table 5 summarises the number of vertebrate 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 vertebrate fauna possibly inhabiting or frequenting the subject site is located in Appendix B.

As previously discussed, 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 subject 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 are likely to be present within the bounds of the subject site.

**Table 5: Summary of Potential Vertebrate Fauna Species (as listed in Appendix B)**

Group	Total number of <u>Potential</u> species	Potential number of <u>Specially Protected</u> species	Potential number of <u>Migratory</u> species	Potential number of <u>Priority</u> species	Number of species <u>recorded</u> during field surveys
Amphibians	8	0	0	0	2
Reptiles	13	0	0	0	2
Birds	78 <sup>1</sup>	4	0	0	46 <sup>1</sup>
Non-Volant Mammals	11 <sup>8</sup>	1	0	0	7 <sup>4</sup>
Volant Mammals (Bats)	8	0	0	0	0
<b>Total</b>	<b>118<sup>9</sup></b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>57<sup>5</sup></b>

Superscript = number of introduced species included in total.

### 5.3.2 Vertebrate Fauna of Conservation Significance

A review of the *EPBC Act* threatened fauna list, DBCA's threatened fauna database and priority list, unpublished reports and scientific publications identified a number of specially protected, priority or migratory vertebrate fauna species as potentially occurring in the general vicinity of the subject site. Of these species, those that have no potential whatsoever to utilise the subject site for any purpose have been omitted from the potential list (Appendix B), principally due to lack of suitable habitat (including extent and/or quality) or known local/regional extinction.

In summary, four vertebrate fauna species of conservation significance were positively identified as utilising the subject site for some purpose during the survey period, these being:

- Carnaby's Black-Cockatoo *Calyptorhynchus latirostris* – S2 (*BC Act*), Endangered (*EPBC Act*)  
Small areas of favoured foraging habitat (i.e. marri, jarrah, banksia and pines) present. Evidence of foraging observed in the form of chewed marri fruits and pine cones. Larger trees ( $\geq 50$ cm DBH) can be considered potential breeding habitat. No roosting sites identified.
- Baudin's Black-Cockatoo *Calyptorhynchus baudinii* – S2 (*BC Act*), Endangered (*EPBC Act*)  
Small areas of favoured foraging habitat (i.e. marri, banksia and pines) present. Evidence of foraging attributed to this species observed in the form of chewed marri fruits. Larger trees ( $\geq 50$ cm DBH) can be considered potential breeding habitat. No roosting sites identified.
- Forest Red-tailed Black-Cockatoo *Calyptorhynchus banksii naso* – S3 (*BC Act*), Vulnerable (*EPBC Act*)  
Three individuals observed during the survey period in October 2019. 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. Larger trees ( $\geq 50$ cm DBH) can be considered potential breeding habitat. No roosting sites identified.
- Western Ringtail Possum *Pseudocheirus occidentalis* – S1 (*BC Act*), Critically Endangered (*EPBC Act*)  
This species seems to be persisting in the northern section of the McGibbon Track in low numbers. Appears to be absent from other sections of the subject site.

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



This species being:

- Peregrine Falcon *Falco peregrinus* – 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.

As indicated for some species habitat within the subject site, while considered possibly suitable, may be marginal in extent/quality and species listed may only visit the area for short periods, or as rare/uncommon vagrants/transients.

A number of other species of conservation significance, while possibly present in the wider area (e.g. Whicher Range), are not listed 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. Details on conservation significant species and reasons for the omission of some from the potential listing are provided in Appendix E and Table 6.

### 5.3.3 Invertebrate Fauna of Conservation Significance

Two conservation significant invertebrate species appeared in the DBCA NatureMap database search (DBCA 2019), the Swan Coastal Plain shield-backed trapdoor spider and Carter's freshwater mussel. Neither species are however considered likely to frequent the subject site primarily due to a lack of suitable (type, quality and/or extent) habitat. Details on each species and reasons for their omission from the likely species listing are provided in Appendix E and Table 6.

The Swan Coastal Plain as a whole has a limited occurrence of species considered to be short range endemics (Invertebrate Solutions 2018). At Yalyalup the area of proposed ground disturbing activity is almost totally confined to areas cleared of native vegetation which are highly unlikely to represent habitat suitable for SREs. The small areas of remnant vegetation/habitat in adjoining areas would have once been widespread/continuous and there are no apparent geomorphological boundaries or subdivisions that would have represented species isolators prior to clearing. Invertebrate species currently utilising these areas would therefore be unlikely to have distributions totally restricted to the Project area.

Targeted surveys for SREs have not been undertaken at any of the nearby mineral sand mines on the southern Swan Coastal Plain in the past (e.g. Yoongarillup, Wonnerup, Wonnerup South, Wonnerup North, Yoganup, Yoganup Extended, Yoganup 215, Tutunup South, Tutunup, Happy Valley, Gwindinup and Ludlow). Where invertebrates have been collected during general fauna surveys at these sites as bycatch none have been identified as being confirmed SREs (Harewood 2012, Biota 2007a, Biota 2007b, Biota 2009) suggesting the probability of SREs occurring at Yalyalup would be very low.

## **6. FAUNA VALUES**

### **6.1 CONSERVATION SIGNIFICANCE OF THE SUBJECT SITE**

The conservation significance of vegetation within the subject site has been determined by applying site specific criteria such as:

- Fauna species and/or habitat present that is poorly represented in the general vicinity (<10km) of the subject site;
- Fauna habitat in better condition than other similar locations in the general vicinity (<10km) of subject site; and
- Fauna habitat within the subject site supporting species of conservation or other significance.

Natural areas within the south west of Western Australia have been significantly altered since European settlement in the 1830's and a variety of environmental factors, in particular habitat fragmentation and fire, will continue to threaten many species of fauna with local extinction. As the local development of land progresses the significance of any remnant vegetation increases.

The extent of natural fauna habitat within the subject site is relatively small and the remnants present are generally highly degraded and fragmented. Because of these facts the overall value to fauna can be regarded as low when compared to other nearby areas such as the Whicher Range and the Ludlow Tuart Forest. The vegetation does however have some value to at least one conservation significant fauna species, the western ringtail possum which is persisting in the area despite the large degree of historical clearing/fragmentation.

As previously mentioned, the two seasonal creek systems which pass through the subject site also have very low fauna values given their long history of disturbance. This is primarily a consequence of total or partial clearing of vegetation from their banks, modification of the creek line path in some sections and the fact they have been or are open to ongoing livestock access which further degrades the habitat at water quality.

### **6.2 VALUE OF THE SUBJECT SITE AS AN ECOLOGICAL LINKAGE/WILDLIFE CORRIDOR**

Linkage with adjacent bushland areas has been identified as a natural attribute of high priority in the assessment of a sites regional significance (EPA 2002a). Detailed analyses of potential ecological linkages completed for the south west (Molloy *et al.* 2009) shows no identified regional ecological linkages with the subject site, the closest being along the Sabina River to the west.

The lack of function as an ecological linkage is obviously a consequence of the high degree of clearing and fragmentation of vegetation that has historically occurred within and around

the subject site. Given the proposed development footprint will only require the removal of a small amount of native vegetation the existing values of the subject site in this regard will not significantly change.

## 7. POTENTIAL IMPACTS OF DEVELOPMENT

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

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

Planning for the proposed mineral sand mine within the Yalyalup Mineral Sands Project is not yet fully finalised, however it is understood that the clearing of vegetation will be limited to a few paddock trees and small amounts of vegetation bordering road reserves, with the main remnants in the subject site area remaining unaffected. It is understood that rehabilitation of the site post mining will be to pre-mining topography and thus ensuring the pre-disturbance hydrological flows are maintained. Other potential impacts (e.g. noise, dust, light etc) will be managed under existing management practices and therefore it is anticipated that impacts on fauna and fauna habitat will be negligible.

Based on the limited extent of proposed clearing, and other factors such as habitat quality/value and existing degree of fragmentation, the likely impacts on species of conservation significance previously recorded in the general area has been assessed, a summary of which is provided in Table 6 below. Additional information on specific fauna species is provided in Appendix E.



**Table 6: Likelihood of Occurrence and Possible Impacts – Fauna Species of Conservation Significance (continues on following pages).**

Common Name	Genus & Species	Conservation Status (See Appendix A for codes)	Habitat Present	Likelihood of Occurrence	Possible Impacts/ Significance of Possible Impacts
Swan Coastal Plain Shield-backed Trapdoor Spider	<i>Idiosoma sigillatum</i>	P3	No/Marginal	Unlikely to Occur	No impact/Negligible.
Carter's Freshwater Mussel	<i>Westralunio carteri</i>	S3	No	Would Not Occur	No impact.
Pouched Lamprey	<i>Geotria australis</i>	P1	No/Very Marginal	Would Not Occur	No impact.
Balston's Pygmy Perch	<i>Nannatherina balstoni</i>	S3, VU	No	Would Not Occur	No impact.
Coastal Plains Skink	<i>Ctenotus ora</i>	P3	No/Marginal	Unlikely to Occur	No impact/Negligible.
Australasian Bittern	<i>Botaurus poiciloptilus</i>	S2, EN	No	Would Not Occur	No impact.
Blue-billed Duck	<i>Oxyura australis</i>	P4	No/Very Marginal	Would Not Occur	No impact.
Glossy Ibis	<i>Plegadis falcinellus</i>	S3	Yes/Marginal	Unlikely to Occur	No impact/Negligible.
Migratory Shorebirds/Wetland Species/Marine Vertebrates	Various	Mig, Various	No	Would Not Occur	No impact.
Eastern Osprey	<i>Pandion haliaetus</i>	S5, Mig	No	Would Not Occur	No impact.
Peregrine Falcon	<i>Falco peregrinus</i>	S6	Yes	Possibly Occurs but only rarely.	No impact/Negligible.
Masked Owl	<i>Tyto novaehollandae novaehollandae</i>	P3	Yes/Marginal	Unlikely to Occur	No impact/Negligible.
Fork-tailed Swift	<i>Apus pacificus</i>	S5, Mig	Yes	Unlikely to Occur, Flyover only on very rare occasions.	No impact.
Grey Wagtail	<i>Motacilla cinerea</i>	S5, Mig	No	Would Not Occur	No impact.
Carnaby's Black Cockatoo	<i>Calyptorhynchus latirostris</i>	S2, EN	Yes	Known to Occur	Loss of very small number of isolated trees/Negligible.
Baudin's Black Cockatoo	<i>Calyptorhynchus baudinii</i>	S2, EN	Yes	Known to Occur	Loss of very small number of isolated trees/Negligible.
Forest Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii naso</i>	S3, VU	Yes	Known to Occur	Loss of very small number of isolated trees/Negligible.
Chuditch	<i>Dasyurus geoffroii</i>	S3, VU	No	Would Not Occur	No impact.
South-western Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>	S6	No	Unlikely to Occur	No impact/Negligible.

Common Name	Genus & Species	Conservation Status (See Appendix A for codes)	Habitat Present	Likelihood of Occurrence	Possible Impacts/ Significance of Possible Impacts
Quenda	<i>Isodon fusciventer</i>	P4	No	Unlikely to Occur	No impact/Negligible.
Western Ringtail Possum	<i>Pseudocheirus occidentalis</i>	S1, CR	Yes	Known to Occur	No impact/Negligible
Quokka	<i>Setonix brachyurus</i>	S3, VU	No	Would Not Occur	No impact.
Western Brush Wallaby	<i>Macropus irma</i>	P4	No	Would Not Occur	No impact.
Woylie	<i>Bettongia penicillata ogilbyi</i>	S1	No	Would Not Occur	No impact.
Western False Pipistrelle	<i>Falsistrellus mackenziei</i>	P4	No/Marginal	Unlikely to Occur	No impact/Negligible.
Water Rat	<i>Hydromys chrysogaster</i>	P4	No/Marginal	Unlikely to Occur	No impact/Negligible.

Based on available information no substantial impacts on any fauna species or overall biodiversity values are anticipated as a consequence of development at the site occurring. In cases where some impact is anticipated, the degree of the impact is only expected to be very low and relates to the loss of very small areas of habitat, primarily in the form of a small number of scattered, isolated paddock trees. This coupled with the fact that most of the species known to or likely to occur are common and widespread, no overall change in their conservation status is anticipated, despite a possible, very localised/small reduction in habitat extent.

## 8. CONCLUSION

The fauna assessment within the subject site was undertaken for the purposes of delineating and characterising the fauna habitats and faunal assemblages present. Targeted searches for western ringtail possum individuals and their habitat were also carried out. A targeted black cockatoo habitat assessment was also undertaken.

With respect to native vertebrate fauna, 11 mammal (including eight bat species), 77 bird, 13 reptile and eight frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the subject site at times, a conclusion largely based on the presence of apparently suitable habitat.

Four vertebrate fauna species of conservation significance were positively identified as utilising the subject site for some purpose during the survey period, this being the western ringtail possum (Critically Endangered), Carnaby's black cockatoo (Endangered), Baudin's black cockatoo (Endangered) and the forest red-tailed black cockatoo (Vulnerable). An additional species of conservation significance may also utilise the subject site, though, as

no evidence of its presence was identified during the field survey, its status in the area remains uncertain (peregrine falcon (Schedule 7)).

Overall fauna habitat values within the subject site have been severely compromised by the almost total removal (~95%) of native vegetation. Most areas lack any natural attributes and are now only likely to be utilised by generally common and widespread fauna species with non-specific requirements which allow them to persist in highly disturbed habitats. As a consequence, the fauna biodiversity of the subject site is well below levels present prior to historical disturbance having occurred and can therefore be regarded as highly depauperate. The overall fauna assemblage can therefore be regarded highly unlikely to be of local or regional significance.

Despite this the subject site has some value as habitat for a small number of fauna species of conservation significance though the extent of suitable habitat is small and therefore the number of actual individuals likely to utilise these areas is also small.

It is understood that any future development at the subject site will be largely confined to existing cleared areas with the main clearing required being a small number of scattered paddock trees. Based on this information, no direct, substantial impacts on any fauna species or existing biodiversity values are anticipated. In cases where some impact does occur it is only expected to be very low/negligible. This coupled with the fact that most of the species known to or likely to occur are common and widespread, no overall change in their conservation status is considered likely.

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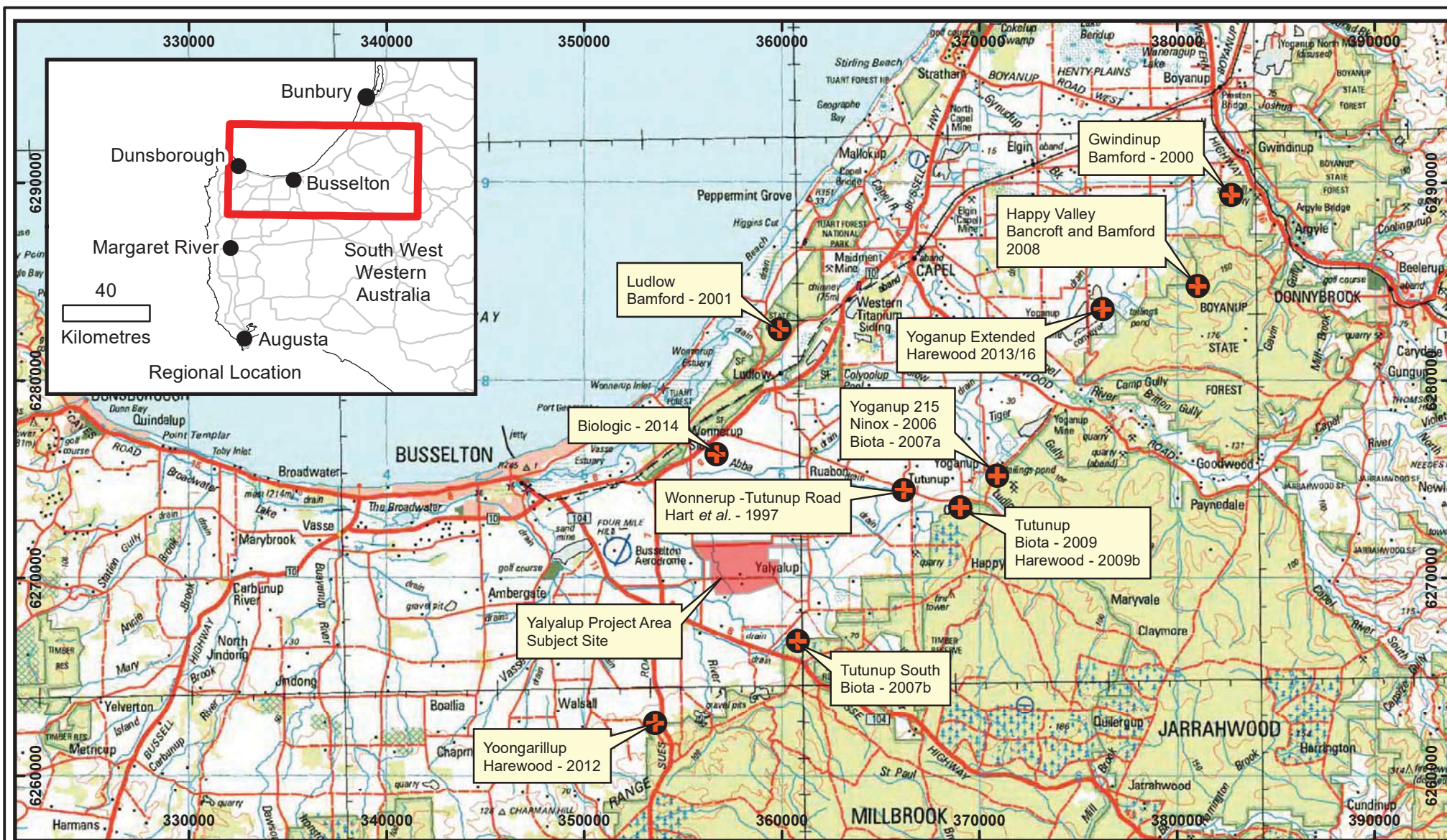
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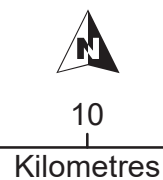
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# FIGURES



## Legend

- Subject Site
- +
 Previous Nearby Fauna Surveys



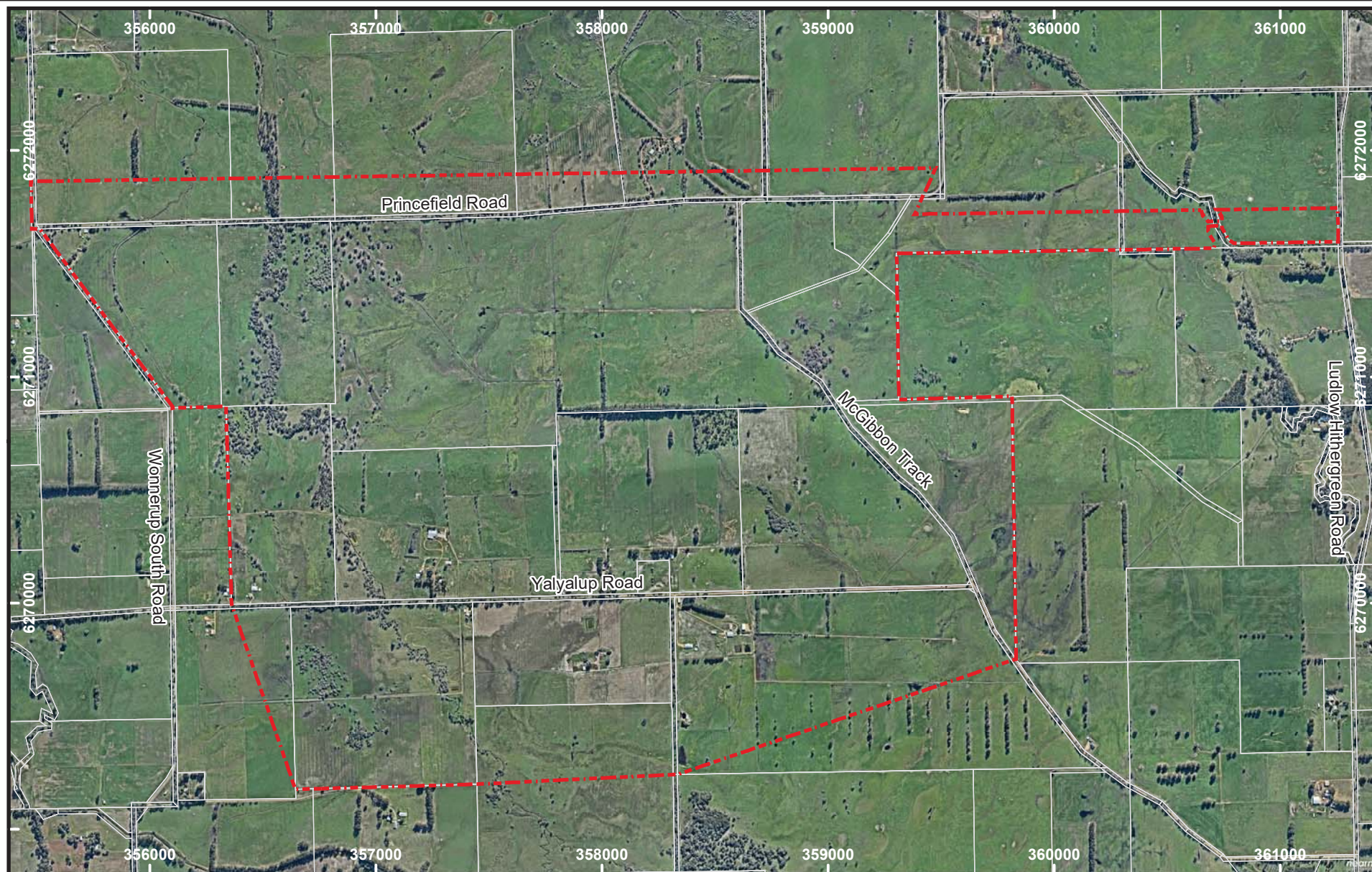
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Scale: 1:275,000

Yalyalup Project Area  
Doral Mineral Sands Pty Ltd


## Subject Site and Surrounds

Projection/Coordinate System: UTM/MGA Zone 50 Figure: 1





## Legend

 Subject Site



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Kilometres



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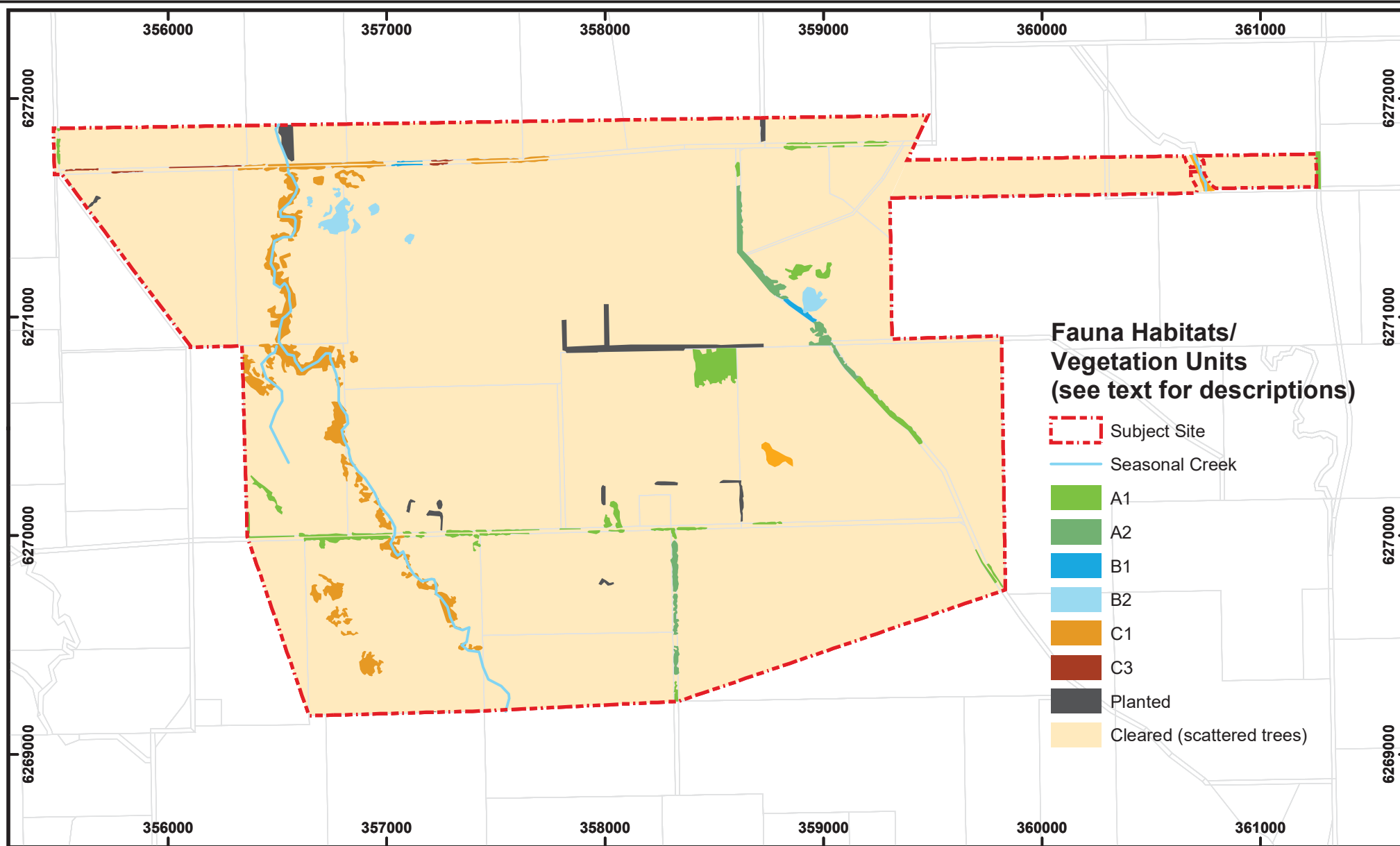
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Yalyalup Project Area  
Doral Mineral Sands Pty Ltd

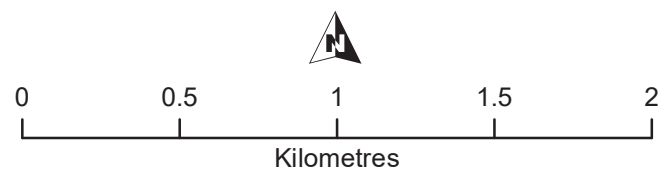
**Subject Site  
Air Photo**

Figure: 2



## Legend

Subject Site



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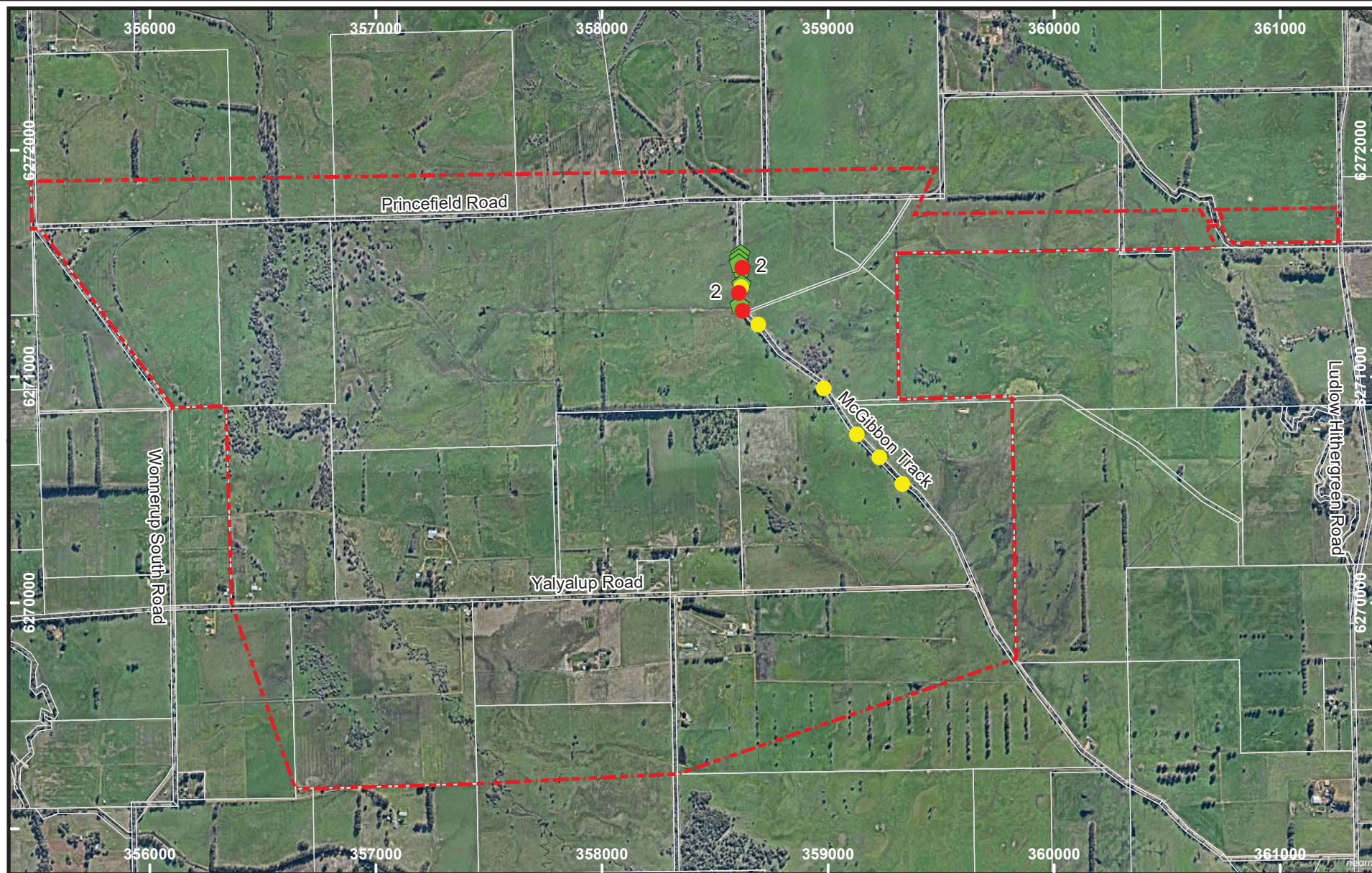
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Projection/Coordinate System: UTM/MGA Zone 50

Yalyalup Project Area  
Doral Mineral Sands Pty Ltd  
**Fauna Habitats/  
Vegetation Units  
(modified from  
EcoEdge 2016)**

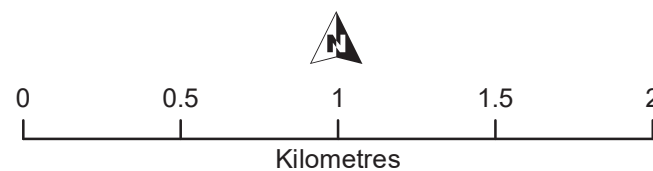
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## Legend

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|--|---|
|  Subject Site |  Common Brushtail Possum (6) |
|  WRP Drey (6) |  Western Ringtail Possum (5) |



Drawn: G Harewood  
Date: Aug 2019  
Scale: 1:24,000

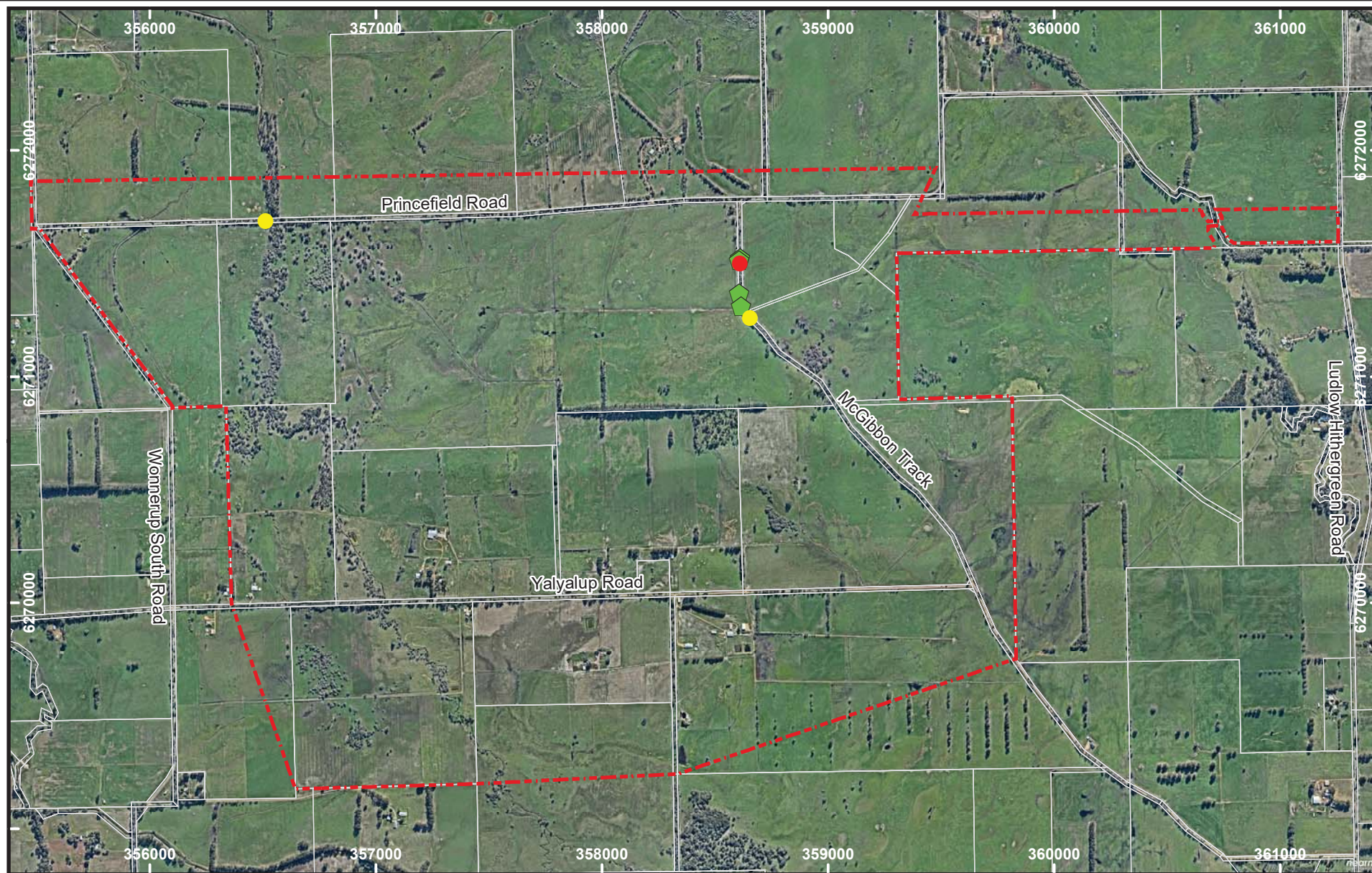
Yalyalup Project Area  
Doral Mineral Sands Pty Ltd

## Possum Observations (June 2017)

Projection/Coordinate System: UTM/MGA Zone 50

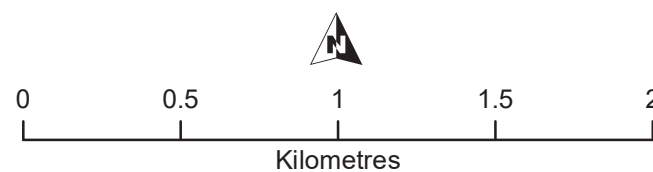
Figure: 4





## Legend

- |   |   |
|---|---|
| <span style="border: 2px dashed red; padding: 2px;"> </span> Subject Site | <span style="color: yellow;">●</span> Common Brushtail Possum (2) |
| <span style="color: green;">◆</span> WRP Drey (4)                         | <span style="color: red;">●</span> Western Ringtail Possum (1)    |



Drawn: G Harewood  
Date: Aug 2019  
Scale: 1:24,000

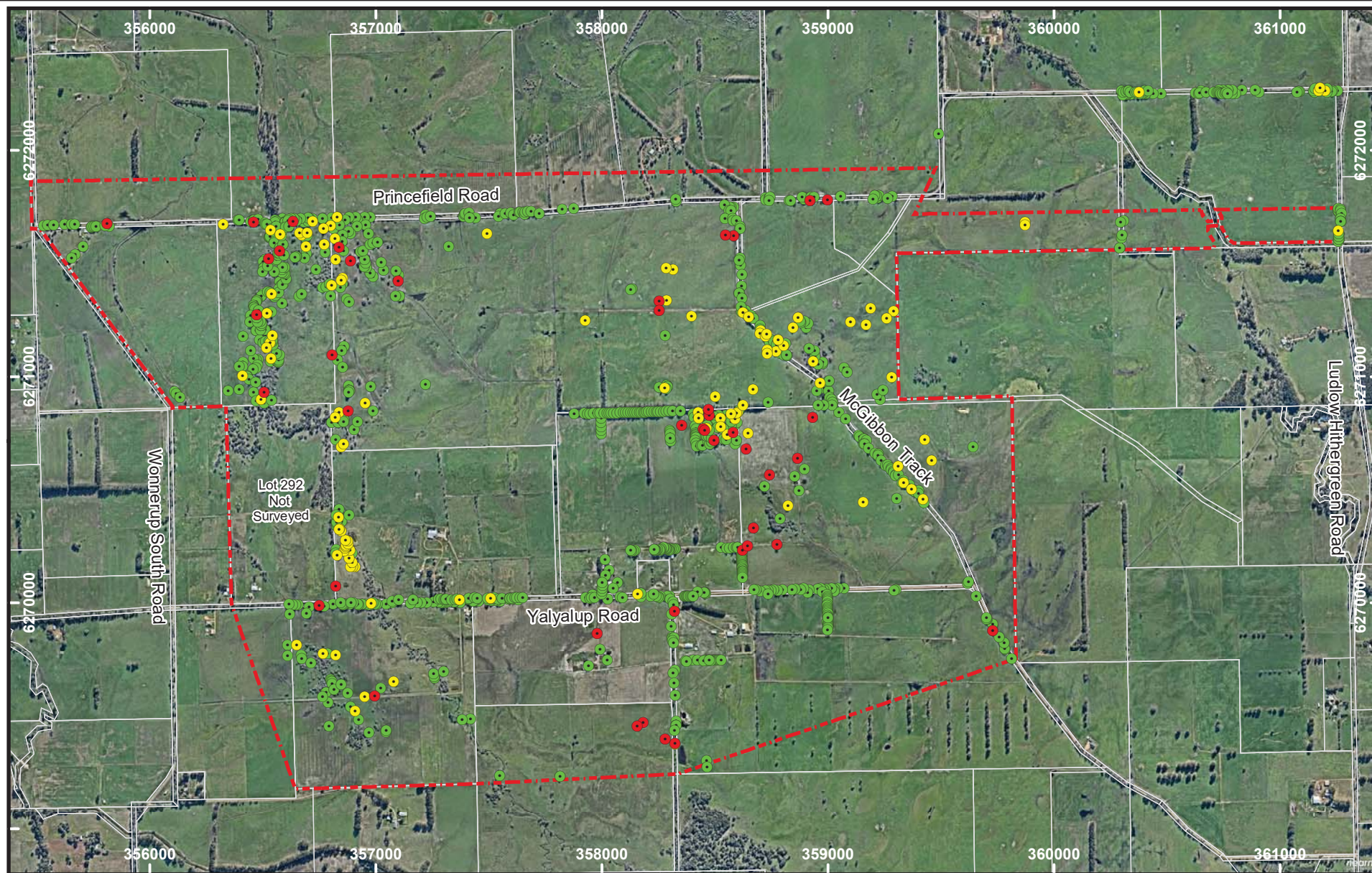
Yalyalup Project Area  
Doral Mineral Sands Pty Ltd

## Possum Observations (August 2019)

Projection/Coordinate System: UTM/MGA Zone 50

Figure: 5

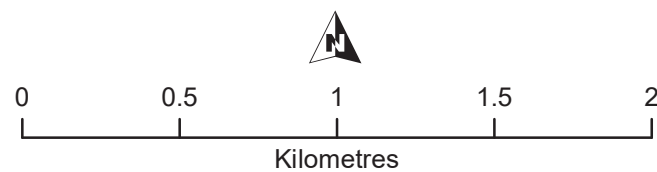




## Legend

  Subject Site

- Habitat Tree - One or more large hollows possibly suitable for black cockatoos
- Habitat Tree - One or more possible hollows unsuitable for black cockatoos
- Habitat Tree - No hollows seen



Drawn: G Harewood  
Date: Aug 2019  
Scale: 1:24,000

**Yalyalup Project Area**  
**Doral Mineral Sands Pty Ltd**

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

Projection/Coordinate System: UTM/MGA Zone 50

Figure: 6

# **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:

<b>Category</b>	<b>Code</b>	<b>Description</b>
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*™ 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**

## **FAUNA OBSERVED OR POTENTIALLY PRESENT**

# Fauna Observed or Potentially Present

## Yalyalup Project Area

Approx. centroid = 115° 27' 58" E, 33° 41' 40" S

Compiled by Greg Harewood - October 2019

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

A = Harewood, G (2019). Fauna Assessment Yalyalup Project Area. Unpublished report for Doral Mineral Sands Pty Ltd. October 2019.

B = Harewood, G (2013). Terrestrial Fauna Assessment (Level 1) Yoganup Extended Mineral Sands Project. Unpublished report for Iluka Resources Limited. March 2013.

C = Harewood, G (2014). Phase 1 and 2 Seasonal Fauna Surveys (Level 2) . Yoongarillup Mineral Sands Project. Unpublished report for Doral Mineral Sands Pty Ltd.

D = Biologic (2014). Wonnerup North Vertebrate Fauna Assessment. Unpublished report for Cristal Mining Australia Ltd.

E = Biota (2009). Tutunup Fauna Assemblage and Fauna Habitat Seasonal Survey. Unpublished report for Iluka Resources. March 2009.

F = Biota (2007a). Yoganup 215 Strand Fauna and Faunal Assemblage Survey. Unpublished report for Iluka Resources. February 2007.

G = Biota (2007b). Tutunup South Fauna Habitat and Fauna Assemblage Seasonal Survey. Unpublished report for Iluka Resources. December 2007.

H = Bamford, M. and A. (2001). Fauna Survey of the Ludlow Mining Lease. Final Report. Unpublished report for Cable Sands (WA) Pty Ltd. November 2001.

I = Hart, Simpson and Assoc. (1997). Wonnerup -Tutunup Road - Vertebrate Fauna. Unpublished report for Westralian Sands Ltd.

J = DBCA (2019). NatureMap Database search. "By Circle" 115° 27' 58" E, 33° 41' 40" S (plus 20km buffer). 27 August 2019.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
<b>Amphibia</b>												
<b>Myobatrachidae</b>												
Ground or Burrowing Frogs												
<i>Crinia georgiana</i>	Quacking Frog	LC	X				X	X	X		X	X
<i>Crinia glauerti</i>	Clicking Frog	LC		X		X	X	X			X	
<i>Crinia insignifera</i>	Squelching Froglet	LC	X		X	X	X	X	X	X	X	X
<i>Geocrinia leai</i>	Ticking Frog	LC										X
<i>Heleioporus eyrei</i>	Moaning Frog	LC			X	X	X	X	X	X	X	X
<i>Limnodynastes dorsalis</i>	Western Banjo Frog	LC			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 <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
<b>Hylidae</b>												
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
<b>Reptilia</b>												
<b>Gekkonidae</b>												
Geckoes												
<i>Christinus marmoratus</i>	Marbled Gecko				X	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 <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
<b>Scincidae</b> Skinks												
<i>Acritoscincus trilineatus</i>	Southwestern Cool Skink				X	X	X	X	X		X	
<i>Cryptoblepharus buchananii</i>	Fence Skink		X		X	X	X	X	X	X		X
<i>Egernia kingii</i>	King's Skink				X		X	X			X	X
<i>Hemiergis gracilipes</i>	Southwestern Mulch Skink							X				X
<i>Hemiergis peronii tridactyla</i>	Three-toed Earless Skink				X	X	X	X		X	X	
<i>Hemiergis quadrilineata</i>	Two-toed Mulch Skink											X
<i>Lerista elegans</i>	West Coast Four-toed Lerista				X	X	X	X	X	X		X
<i>Menetia greyii</i>	Dwarf Skink				X		X	X	X	X	X	X
<i>Morethia lineocellata</i>	West Coast Pale-flecked Morethia				X		X	X	X	X	X	X
<i>Tiliqua rugosa</i>	Bobtail				X	X	X	X	X	X	X	X
<b>Elapidae</b> Elapid Snakes												
<i>Notechis scutatus</i>	Tiger Snake							X			X	X
<i>Pseudonaja affinis</i>	Dugite		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 <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
<b>Aves</b>												
<b>Phasianidae</b> Quails, Pheasants												
<i>Coturnix pectoralis</i>	Stubble Quail	LC		X	X	X						X
<b>Anatidae</b> Geese, Swans, Ducks												
<i>Anas gracilis</i>	Grey Teal	LC	X	X		X		X			X	X
<i>Anas superciliosa</i>	Pacific Black Duck	LC	X	X		X	X	X			X	X
<i>Chenonetta jubata</i>	Australian Wood Duck	LC	X	X	X	X	X	X			X	X
<i>Tadorna tadornoides</i>	Australian Shelduck	LC	X	X	X	X	X			X	X	X
<b>Phalacrocoracidae</b> Cormorants												
<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant	LC		X								
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	LC					X					X
<b>Ardeidae</b> Hérons, Egrets, Bitterns												
<i>Ardea alba</i>	Great Egret	CA JA		X								
<i>Ardea novaehollandiae</i>	White-faced Heron	LC	X	X	X	X	X	X			X	
<i>Ardea pacifica</i>	White-necked Heron	LC		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 <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.



Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
<b>Threskiornithidae</b>												
Ibises, Spoonbills												
<i>Platalea flavipes</i>	Yellow-billed Spoonbill	LC		X		X						X
<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	X	X			X	X
<b>Accipitridae</b>												
Kites, Goshawks, Eagles, Harriers												
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	LC			X					X		X
<i>Accipiter fasciatus</i>	Brown Goshawk	LC		X					X	X		X
<i>Aquila audax</i>	Wedge-tailed Eagle	LC			X	X	X	X		X	X	X
<i>Aquila morphnoides</i>	Little Eagle	LC		X						X		
<i>Circus approximans</i>	Swamp Harrier	LC		X				X				X
<i>Elanus caeruleus</i>	Black-shouldered Kite	LC		X								
<i>Haliastur sphenurus</i>	Whistling Kite	LC		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 <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
<b>Falconidae</b> Falcons												
<i>Falco berigora</i>	Brown Falcon	LC								X		X
<i>Falco cenchroides</i>	Australian Kestrel	LC	X	X	X	X		X				X
<i>Falco longipennis</i>	Australian Hobby	LC						X				X
<i>Falco peregrinus</i>	Peregrine Falcon	S7 LC										X
<b>Charadriidae</b> Lapwings, Plovers, Dotterels												
<i>Vanellus tricolor</i>	Banded Lapwing	LC		X								X
<b>Columbidae</b> Pigeons, Doves												
<i>Ocyphaps lophotes</i>	Crested Pigeon	LC	X	X	X	X	X	X			X	X
<i>Phaps chalcoptera</i>	Common Bronzewing	LC	X	X	X	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 <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
<b>Psittacidae</b> Parrots												
<i>Cacatua roseicapilla</i>	Galah	LC	X	X								X
<i>Cacatua sanguinea</i>	Little Corella	LC	X	X								X
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo	S3 VU	X	X	X		X	X	X		X	
<i>Calyptorhynchus baudinii</i>	Baudin's Black Cockatoo	S2 EN VU	X	X	X	X	X	X			X	X
<i>Calyptorhynchus latirostris</i>	Carnaby's Black Cockatoo	S2 EN EN	X	X	X	X	X	X	X	X	X	X
<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet	LC			X				X			
<i>Neophema elegans</i>	Elegant Parrot	LC	X	X	X	X	X	X	X			X
<i>Platycercus icterotis icterotis</i>	Western Rosella (western ssp)	LC					X	X		X		
<i>Platycercus spurius</i>	Red-capped Parrot	LC	X	X	X	X	X	X	X	X	X	X
<i>Platycercus zonarius</i>	Australian Ringneck	LC	X	X	X	X	X	X	X	X	X	X
<i>Polytelis anthopeplus</i>	Regent Parrot	LC				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 <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
<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				X
<i>Chrysococcyx lucidus</i>	Shining Bronze Cuckoo	LC			X		X	X		X	X	X
<i>Cuculus pallidus</i>	Pallid Cuckoo	LC					X				X	
<b>Strigidae</b> Hawk Owls												
<i>Ninox novaeseelandiae</i>	Boobook Owl	LC	X	X	X	X	X			X		
<b>Tytonidae</b> Barn Owls												
<i>Tyto alba</i>	Barn Owl	LC		X								X
<b>Podargidae</b> Frogmouths												
<i>Podargus strigoides</i>	Tawny Frogmouth	LC		X			X			X		X
<b>Halcyonidae</b> Tree Kingfishers												
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Introduced	X	X	X	X	X	X	X	X	X	X
<i>Todiramphus sanctus</i>	Sacred Kingfisher	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 <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
<b>Meropidae</b> Bee-eaters												
<i>Merops ornatus</i>	Rainbow Bee-eater	JA LC		X	X	X	X	X	X	X	X	X
<b>Maluridae</b> Fairy Wrens, GrassWrens												
<i>Malurus splendens</i>	Splendid Fairy-wren	LC	X	X	X	X	X	X	X	X	X	X
<b>Acanthizidae</b> Thornbills, Geryones, Fieldwrens & Whitefaces												
<i>Acanthiza apicalis</i>	Broad-tailed Thornbill	LC	X	X	X		X	X	X	X	X	X
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	LC	X	X	X	X	X	X		X	X	X
<i>Gerygone fusca</i>	Western Gerygone	LC	X	X	X	X	X	X	X	X	X	X
<i>Sericornis maculatus</i>	Spotted Scrubwren	LC	X		X	X	X	X	X	X		
<i>Smicrornis brevirostris</i>	Weebill	LC	X		X		X		X	X		X
<b>Pardalotidae</b> Pardalotes												
<i>Pardalotus striatus</i>	Striated Pardalote	LC	X	X	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	J
<b>Meliphagidae</b> Honeyeaters, Chats												
<i>Anthochaera carunculata</i>	Red Wattlebird	LC	X	X	X	X		X	X	X	X	X
<i>Epthianura albifrons</i>	White-fronted Chat	LC						X				X
<i>Lichenostomus virescens</i>	Singing Honeyeater	LC	X				X		X			
<i>Lichmera indistincta</i>	Brown Honeyeater	LC	X	X	X	X	X	X	X	X	X	X
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	LC	X	X	X	X	X	X	X		X	X
<b>Pachycephalidae</b> Crested Shrike-tit, Crested Bellbird, Shrike Thrushes, Whistlers												
<i>Pachycephala occidentalis</i>	Western Whistler	LC	X	X	X	X	X	X	X	X		
<i>Pachycephala rufiventris</i>	Rufous Whistler	LC	X	X	X		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
<i>Rhipidura fuliginosa</i>	Grey Fantail	LC	X	X	X	X	X	X	X	X	X	
<i>Rhipidura leucophrys</i>	Willie Wagtail	LC	X	X	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	J
<b>Campephagidae</b> Cuckoo-shrikes, Trillers												
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	LC	X	X	X	X	X	X	X	X	X	X
<i>Lalage tricolor</i>	White-winged Triller	LC	X	X								X
<b>Artamidae</b> Woodswallows, Butcherbirds, Currawongs												
<i>Artamus cinereus</i>	Black-faced Woodswallow	LC	X	X				X		X	X	X
<i>Artamus cyanopterus</i>	Dusky Woodswallow	LC		X			X	X	X			X
<b>Cracticidae</b> Currawongs, Magpies & Butcherbirds												
<i>Cracticus tibicen</i>	Australian Magpie	LC	X	X	X	X	X	X	X	X	X	X
<i>Cracticus torquatus</i>	Grey Butcherbird	LC	X	X	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	X	X
<b>Motacillidae</b> Old World Pipits, Wagtails												
<i>Anthus australis</i>	Australian Pipit	LC	X	X	X	X	X	X				

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
<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			X	
<b>Sylviidae</b> Old World Warblers												
<i>Cincloramphus cruralis</i>	Brown Songlark	LC			X							
<i>Cincloramphus mathewsi</i>	Rufous Songlark	LC									X	
<b>Zosteropidae</b> White-eyes												
<i>Zosterops lateralis</i>	Silvereye	LC	X	X			X	X	X	X	X	X
<b>Mammalia</b>												
<b>Phalangeridae</b> Brushtail Possums, Cuscuses												
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	LC	X	X	X	X	X	X	X	X	X	X
<b>Pseudocheiridae</b> Ringtail Possums												
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	S1 CR CR	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	X	X	X

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
<b>Molossidae</b> Freetail Bats												
<i>Austronomus australis</i>	White-striped Freetail-bat	LC		X	X	X		X	X	X		
<i>Ozimops kitcheneri</i>	South-western Freetail-bat	LC			X	X						
<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	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	X		
<i>Nyctophilus major</i>	Western Long-eared Bat	LC								X		
<i>Vespadelus regulus</i>	Southern Forest Bat	LC			X	X	X	X	X			X
<b>Muridae</b> Rats, Mice												
<i>Mus musculus</i>	House Mouse	Introduced			X	X	X	X		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	I	J
<b>Canidae</b> Dogs, Foxes												
<i>Canis lupus familiaris</i>	Dog	Introduced	X			X						
<i>Vulpes vulpes</i>	Red Fox	Introduced		X	X	X	X			X	X	
<b>Felidae</b> Cats												
<i>Felis catus</i>	Cat	Introduced		X		X	X			X		
<b>Equidae</b> Horses												
<i>Equus caballus</i>	Horse	Introduced	X			X						
<b>Bovidae</b> Horned Ruminants												
<i>Bos taurus</i>	European Cattle	Introduced	X	X	X	X						X
<b>Leporidae</b> Rabbits, Hares												
<i>Oryctolagus cuniculus</i>	Rabbit	Introduced	X	X	X	X	X	X	X	X	X	

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# **APPENDIX C**

## **DBCA & EPBC DATABASE SEARCH RESULTS**

# NatureMap - Yalyalup Project Area

Created By Greg Harewood on 27/08/2019

**Kingdom** Animalia  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Method** 'By Circle'  
**Centre** 115° 27' 58" E, 33° 27' 58" S  
**Buffer** 20km  
**Group By** Species Group

Species Group	Species	Records
Amphibian	9	288
Bird	182	9680
Fish	39	86
Invertebrate	118	371
Mammal	29	1949
Reptile	33	220
<b>TOTAL</b>	<b>410</b>	<b>12594</b>

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
<b>Amphibian</b>				
1.	25398 <i>Crinia georgiana</i> (Quacking Frog)			
2.	25400 <i>Crinia insignifera</i> (Squelching Froglet)			
3.	25401 <i>Crinia pseudinsignifera</i> (Bleating Froglet)			
4.	25404 <i>Geocrinia leai</i> (Ticking Frog)			
5.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
6.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
7.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
8.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
9.	25433 <i>Pseudophryne guentheri</i> (Crawling Toadlet)			
<b>Bird</b>				
10.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
11.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
12.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
13.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
14.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
15.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
16.	25755 <i>Acrocephalus australis</i> (Australasian Reed Warbler)			
17.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
18.	25544 <i>Aegotheles cristatus</i> (Australian Owllet-nightjar)			
19.	24310 <i>Anas castanea</i> (Chestnut Teal)			
20.	24312 <i>Anas gracilis</i> (Grey Teal)			
21.	24313 <i>Anas platyrhynchos</i> (Mallard)			
22.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
23.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
24.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
25.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
26.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
27.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
28.	25558 <i>Ardea ibis</i> (Cattle Egret)			
29.	25559 <i>Ardea intermedia</i> (Intermediate Egret)			
30.	41324 <i>Ardea modesta</i> (great egret, white egret)			
31.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
32.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
33.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
34.	24318 <i>Aythya australis</i> (Hardhead)			
35.	<i>Barnardius zonarius</i>			
36.	24319 <i>Biziura lobata</i> (Musk Duck)			
37.	24345 <i>Botaurus poiciloptilus</i> (Australasian Bittern)		T	
38.	25714 <i>Cacatua pastinator</i> (Western Long-billed Corella)			
39.	25715 <i>Cacatua roseicapilla</i> (Galah)			

	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
40.	25716	<i>Cacatua sanguinea</i> (Little Corella)			
41.	25598	<i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
42.	42307	<i>Cacomantis pallidus</i> (Pallid Cuckoo)			
43.	24779	<i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
44.	24780	<i>Calidris alba</i> (Sanderling)		IA	
45.	24784	<i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
46.	24786	<i>Calidris melanotos</i> (Pectoral Sandpiper)		IA	
47.	24788	<i>Calidris ruficollis</i> (Red-necked Stint)		IA	
48.	24789	<i>Calidris subminuta</i> (Long-toed Stint)		IA	
49.	24790	<i>Calidris tenuirostris</i> (Great Knot)		T	
50.	25717	<i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
51.	24731	<i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black Cockatoo)		T	
52.	24733	<i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)		T	
53.	24734	<i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)		T	
54.	48400	<i>Calyptorhynchus</i> sp. (white-tailed black cockatoo)		T	
55.	25575	<i>Charadrius leschenaultii</i> (Greater Sand Plover)		T	
56.	24377	<i>Charadrius ruficapillus</i> (Red-capped Plover)			
57.	24321	<i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
58.		<i>Chroicocephalus novaehollandiae</i>			
59.	24431	<i>Chrysococcyx basalis</i> (Horsfield's Bronze Cuckoo)			
60.	25601	<i>Chrysococcyx lucidus</i> (Shining Bronze Cuckoo)			
61.	24432	<i>Chrysococcyx lucidus</i> subsp. <i>plagosus</i> (Shining Bronze Cuckoo)			
62.		<i>Circus aeruginosus</i>			Y
63.	24288	<i>Circus approximans</i> (Swamp Harrier)			
64.	24289	<i>Circus assimilis</i> (Spotted Harrier)			
65.	24774	<i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
66.	25675	<i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
67.	24399	<i>Columba livia</i> (Domestic Pigeon)	Y		
68.	25568	<i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
69.	25592	<i>Corvus coronoides</i> (Australian Raven)			
70.	24671	<i>Coturnix pectoralis</i> (Stubble Quail)			
71.	25595	<i>Cracticus tibicen</i> (Australian Magpie)			
72.	25596	<i>Cracticus torquatus</i> (Grey Butcherbird)			
73.	24322	<i>Cygnus atratus</i> (Black Swan)			
74.	30901	<i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
75.	25673	<i>Daphoenositta chrysoptera</i> (Varied Sittella)			
76.	25607	<i>Dicaeum hirundinaceum</i> (Mistletoebird)			
77.	25618	<i>Diomedea exulans</i> (Wandering Albatross)		T	
78.		<i>Egretta garzetta</i>			
79.		<i>Egretta novaehollandiae</i>			
80.		<i>Elanus axillaris</i>			
81.	47937	<i>Elseya melanops</i> (Black-fronted Dotterel)			
82.		<i>Eolophus roseicapillus</i>			
83.	24651	<i>Eopsaltria australis</i> subsp. <i>griseogularis</i> (Western Yellow Robin)			
84.	24652	<i>Eopsaltria georgiana</i> (White-breasted Robin)			
85.	24567	<i>Epthianura albifrons</i> (White-fronted Chat)			
86.	24379	<i>Erythronyx cinctus</i> (Red-kneed Dotterel)			
87.	24368	<i>Eurostopodus argus</i> (Spotted Nightjar)			
88.	25621	<i>Falco berigora</i> (Brown Falcon)			
89.	25622	<i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
90.	24472	<i>Falco cenchroides</i> subsp. <i>cenchrus</i> (Australian Kestrel, Nankeen Kestrel)			
91.	25623	<i>Falco longipennis</i> (Australian Hobby)			
92.	25624	<i>Falco peregrinus</i> (Peregrine Falcon)		S	
93.	25727	<i>Fulica atra</i> (Eurasian Coot)			
94.	25729	<i>Gallinula tenebrosa</i> (Dusky Moorhen)			
95.	25730	<i>Gallirallus philippensis</i> (Buff-banded Rail)			
96.	42314	<i>Gavialis virescens</i> (Singing Honeyeater)			
97.	25530	<i>Gerygone fusca</i> (Western Gerygone)			
98.	24271	<i>Gerygone fusca</i> subsp. <i>fusca</i> (Western Gerygone)			
99.	24443	<i>Grallina cyanoleuca</i> (Magpie-lark)			
100.	24487	<i>Haematopus longirostris</i> (Pied Oystercatcher)			
101.	24293	<i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
102.	24295	<i>Haliastur sphenurus</i> (Whistling Kite)			
103.	47965	<i>Hieraaetus morphnoides</i> (Little Eagle)			
104.	25734	<i>Himantopus himantopus</i> (Black-winged Stilt)			
105.	24491	<i>Hirundo neoxena</i> (Welcome Swallow)			
106.	48587	<i>Hydroprogne caspia</i> (Caspian Tern)		IA	
107.	24367	<i>Lalage tricolor</i> (White-winged Triller)			



	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
108.	25638	<i>Larus pacificus</i> (Pacific Gull)			
109.	25661	<i>Lichmera indistincta</i> (Brown Honeyeater)			
110.	25741	<i>Limosa limosa</i> (Black-tailed Godwit)		IA	
111.		<i>Lophoictinia isura</i>			
112.	24690	<i>Macronectes giganteus</i> (Southern Giant Petrel)		IA	
113.	24326	<i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
114.	25654	<i>Malurus splendens</i> (Splendid Fairy-wren)			
115.	24552	<i>Malurus splendens</i> subsp. <i>splendens</i> (Splendid Fairy-wren)			
116.	25758	<i>Megalurus gramineus</i> (Little Grassbird)			
117.	24598	<i>Merops ornatus</i> (Rainbow Bee-eater)			
118.		<i>Microcarbo melanoleucos</i>			
119.	25610	<i>Myiagra inquieta</i> (Restless Flycatcher)			
120.	24738	<i>Neophema elegans</i> (Elegant Parrot)			
121.	24739	<i>Neophema petrophila</i> (Rock Parrot)			
122.	25564	<i>Nycticorax caledonicus</i> (Rufous Night Heron)			
123.	24407	<i>Ocyphaps lophotes</i> (Crested Pigeon)			
124.	24328	<i>Oxyura australis</i> (Blue-billed Duck)		□4	
125.	25680	<i>Pachycephala rufiventris</i> (Rufous Whistler)			
126.		<i>Pachycephala</i> sp.			Y
127.	24692	<i>Pachyptila belcheri</i> (Slender-billed Prion)			
128.	24693	<i>Pachyptila desolata</i> (Antarctic Prion)			
129.	48591	<i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
130.	25681	<i>Pardalotus punctatus</i> (Spotted Pardalote)			
131.	25682	<i>Pardalotus striatus</i> (Striated Pardalote)			
132.	24630	<i>Pardalotus striatus</i> subsp. <i>westraliensis</i> (Striated Pardalote)			
133.	24648	<i>Pelecanus conspicillatus</i> (Australian Pelican)			
134.	48061	<i>Petrochelidon nigricans</i> (Tree Martin)			
135.	48066	<i>Petroica boodang</i> (Scarlet Robin)			
136.	25697	<i>Phalacrocorax carbo</i> (Great Cormorant)			
137.	24667	<i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
138.	25699	<i>Phalacrocorax varius</i> (Pied Cormorant)			
139.	24668	<i>Phalacrocorax varius</i> subsp. <i>hypoleucos</i> (Pied Cormorant)			
140.	24409	<i>Phaps chalcoptera</i> (Common Bronzewing)			
141.	48071	<i>Phylidonyris niger</i> (White-cheeked Honeyeater)			
142.	24596	<i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
143.	24841	<i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
144.	24842	<i>Platalea regia</i> (Royal Spoonbill)			
145.	25720	<i>Platycercus icterotis</i> (Western Rosella)			
146.	24745	<i>Platycercus icterotis</i> subsp. <i>icterotis</i> (Western Rosella)			
147.	24747	<i>Platycercus spurius</i> (Red-capped Parrot)			
148.	25721	<i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
149.	24750	<i>Platycercus zonarius</i> subsp. <i>semitorquatus</i> (Twenty-eight Parrot)			
150.	24843	<i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
151.	24382	<i>Pluvialis fulva</i> (Pacific Golden Plover)		IA	
152.	24383	<i>Pluvialis squatarola</i> (Grey Plover)		IA	
153.	25703	<i>Podargus strigoides</i> (Tawny Frogmouth)			
154.	24679	<i>Podargus strigoides</i> subsp. <i>brachypterus</i> (Tawny Frogmouth)			
155.	25704	<i>Podiceps cristatus</i> (Great Crested Grebe)			
156.	24681	<i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
157.	25722	<i>Polytelis anthopeplus</i> (Regent Parrot)			
158.	25731	<i>Porphyrio porphyrio</i> (Purple Swamphen)			
159.	24767	<i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)			
160.	24769	<i>Porzana fluminea</i> (Australian Spotted Crane)			
161.	25732	<i>Porzana pusilla</i> (Baillon's Crane)			
162.	24771	<i>Porzana tabuensis</i> (Spotless Crane)			
163.	24703	<i>Pterodroma lessonii</i> (White-headed Petrel)			
164.	25710	<i>Pterodroma macroptera</i> (Great-winged Petrel)			
165.		<i>Purpureicephalus spurius</i>			
166.	24776	<i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
167.	48096	<i>Rhipidura albiscapa</i> (Grey Fantail)			
168.	25614	<i>Rhipidura leucophrys</i> (Willie Wagtail)			
169.	25534	<i>Sericornis frontalis</i> (White-browed Scrubwren)			
170.	24279	<i>Sericornis frontalis</i> subsp. <i>maculatus</i> (White-browed Scrubwren)			
171.	30948	<i>Smicronis brevirostris</i> (Weebill)			
172.	24329	<i>Stictonetta naevosa</i> (Freckled Duck)			
173.	25655	<i>Stipiturus malachurus</i> (Southern Emu-wren)			
174.	25597	<i>Strepera versicolor</i> (Grey Currawong)			
175.	25590	<i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
176.	25705	<i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
177.	24331	<i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			

	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
178.	34134	<i>Thalassarche carteri</i> (Indian Yellow-nosed Albatross)		T	
179.	48597	<i>Thalasseus bergii</i> (Crested Tern)		IA	
180.	48135	<i>Thinornis rubricollis</i> (Hooded Plover, Hooded Dotterel)		□4	
181.	24845	<i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
182.	25549	<i>Todiramphus sanctus</i> (Sacred Kingfisher)			
183.	24806	<i>Tringa glareola</i> (Wood Sandpiper)		IA	
184.	24808	<i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	
185.	24809	<i>Tringa stagnatilis</i> (Marsh Sandpiper, little greenshank)		IA	
186.	24852	<i>Tyto alba</i> subsp. <i>delicatula</i> (Barn Owl)			
187.	24855	<i>Tyto novaehollandiae</i> subsp. <i>novaehollandiae</i> (Masked Owl (southwest))		□3	
188.	25577	<i>Vanellus miles</i> (Masked Lapwing)			
189.	24386	<i>Vanellus tricolor</i> (Banded Lapwing)			
190.	41351	<i>Xenus cinereus</i> (Terek Sandpiper)		IA	
191.	25765	<i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			

## ish

192.		? ?			
193.		<i>Acanthaluteres brownii</i>			
194.		<i>Acanthaluteres spilomelanurus</i>			
195.		<i>Acanthaluteres vittiger</i>			
196.		<i>Anoplocapros lenticularis</i>			
197.		<i>Anoplocapros robustus</i>			
198.		<i>Apogon rueppellii</i>			
199.		<i>Aseraggodes haackeanus</i>			
200.		<i>Brachaluteres jacksonianus</i>			
201.		<i>Cantheschenia longipinnis</i>			
202.		<i>Carassius auratus</i>			
203.		<i>Cochleocephalus viridis</i>			
204.		<i>Coryphaena hippurus</i>			
205.		<i>Cristiceps australis</i>			
206.		<i>Dactyloptena</i> sp.			
207.		<i>Dotalabrus aurantiacus</i>			
208.		<i>Echeneis naucrates</i>			
209.		<i>Edelia vittata</i>			
210.		<i>Eubalichthys caeruleoguttatus</i>			
211.		<i>Eubalichthys cyanoura</i>			
212.	34028	<i>Galaxias occidentalis</i> (Western Minnow)			
213.		<i>Gambusia holbrooki</i>			
214.	34030	<i>Geotria australis</i> (Pouched Lamprey)		□3	
215.		<i>Gymnapistes marmoratus</i>			
216.		<i>Haletta semifasciata</i>			
217.		<i>Heteroclinus adelaidae</i>			
218.		<i>Heteroclinus</i> sp.			
219.		<i>Meuschenia freycineti</i>			
220.		<i>Meuschenia galii</i>			
221.		<i>Nannoperca vittata</i>			
222.		<i>Neoplatycephalus aurimaculatus</i>			
223.		<i>Perca fluviatilis</i>			
224.		<i>Posidonichthys hutchinsi</i>			
225.		<i>Scobinichthys granulatus</i>			
226.		<i>Siphamia cephalotes</i>			
227.		<i>Siphonognathus radiatus</i>			
228.		<i>Stigmatopora argus</i>			
229.		<i>Thunnus maccoyii</i>			
230.		<i>Vanacampus poecilolaemus</i>			

## Invertebrate

231.		<i>Acariformes</i> sp.			
232.		<i>Aeshnidae</i> sp.			
233.		<i>Allothreua maculata</i>			
234.		<i>Aname mainae</i>			
235.		<i>Aname tepperi</i>			
236.		<i>Ancylidae</i> sp.			
237.		<i>Anisops</i> sp.			
238.		<i>Antiporus</i> sp.			
239.		<i>Arachnura higginsi</i>			
240.		<i>Araneus cyphoxis</i>			
241.		<i>Araneus senicaudatus</i>			
242.		<i>Argiope protensa</i>			
243.		<i>Arkys alticephala</i>			
244.		<i>Arkys walckenaeri</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
245.	<i>Artoria flavimana</i>			
246.	<i>Artoriopsis expolita</i>			
247.	<i>Austracantha minax</i>			
248.	<i>Austrochthonius strigosus</i>			Y
249.	<i>Backbourkia brounii</i>			
250.	<i>Badumna insignis</i>			
251.	<i>Baetidae sp.</i>			
252.	<i>Baiami volucripes</i>			
253.	<i>Berosus discolor</i>			
254.	<i>Berosus munitipennis</i>			
255.	<i>Caenidae sp.</i>			
256.	<i>Ceinidae sp.</i>			
257.	<i>Celaenia excavata</i>			
258.	<i>Ceratopogonidae sp.</i>			
259.	<i>Cercophonius sulcatus</i>			
260.	<i>Cherax destructor</i>			
261.	<i>Cherax preissii</i>			
262.	<i>Cherax quinquecarinatus</i>			
263.	<i>Chironominae sp.</i>			
264.	<i>Chironomus aff. alternans (V24) (CB)</i>			
265.	<i>Chironomus tepperi</i>			
266.	<i>Chrysomelidae sp.</i>			
267.	<i>Clynotis severus</i>			
268.	<i>Coenagrionidae sp.</i>			
269.	<i>Corduliidae sp.</i>			
270.	<i>Corixidae sp.</i>			
271.	<i>Cormocephalus hartmeyer</i>			
272.	<i>Cryptoerithus quobba</i>			
273.	<i>Culex (Culex) australicus</i>			
274.	<i>Culicidae sp.</i>			
275.	<i>Cyclosa trilobata</i>			
276.	<i>Dingosa serrata</i>			
277.	<i>Dytiscidae sp.</i>			
278.	<i>Ecnomidae sp.</i>			
279.	<i>Eriophora biapicata</i>			
280.	<i>Gelastocoridae sp.</i>			
281.	<i>Geogarypus taylori</i>			
282.	<i>Gomphidae sp.</i>			
283.	<i>Gripopterygidae sp.</i>			
284.	<i>Gyrinidae sp.</i>			
285.	<i>Harrisius sp.</i>			
286.	<i>Helochares tenuistriatus</i>			
287.	<i>Helpis minitabunda</i>			
288.	<i>Hemicorduliidae sp.</i>			
289.	<i>Henicops dentatus</i>			
290.	<i>Hydraenidae sp.</i>			
291.	<i>Hydrobiosidae sp.</i>			
292.	<i>Hydrophilidae sp.</i>			
293.	<i>Hydroptilidae sp.</i>			
294.	<i>Hyridae sp.</i>			
295.	48935 <i>Idiosoma sigillatum</i> (Swan Coastal Plain shield-backed trapdoor spider)		□3	
296.	<i>Isopeda leishmanni</i>			
297.	<i>Isopedella cana</i>			
298.	<i>Kiefferulus intertinctus</i>			
299.	<i>Lampona cylindrata</i>			
300.	<i>Lampona punctigera</i>			
301.	<i>Lancetes lanceolatus</i>			
302.	<i>Latrodectus hasseltii</i>			
303.	<i>Leptoceridae sp.</i>			
304.	<i>Leptophlebiidae sp.</i>			
305.	<i>Lestidae sp.</i>			
306.	<i>Libellulidae sp.</i>			
307.	<i>Limnoxenus zelandicus</i>			
308.	<i>Maratus pavonis</i>			
309.	<i>Megapodagrionidae sp.</i>			
310.	<i>Microvelia sp.</i>			
311.	<i>Missulena granulosa</i>			
312.	<i>Mituliodon tarantulinus</i>			
313.	<i>Mitzoruga insularis</i>			
314.	<i>Nephila edulis</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
315.	<i>Nicodamus mainae</i>			
316.	<i>Notonectidae</i> sp.			
317.	<i>Nunciella aspera</i>			
318.	<i>Ocrisiona parmeliae</i>			
319.	<i>Oligochaeta</i> sp.			
320.	<i>Oratemnus curtus</i>			
321.	<i>Orthocladinae</i> sp.			
322.	<i>Palaemonidae</i> sp.			
323.	<i>Paralimnophyes pullulus</i> (V42)			
324.	<i>Parastacidae</i> sp.			
325.	<i>Perthiidae</i> sp.			
326.	<i>Pholcus phalangoides</i>			
327.	<i>Planorbidae</i> sp.			
328.	<i>Platorish gelorup</i>			
329.	<i>Polypedilum</i> nr. <i>convexum</i> (SAP)			
330.	<i>Protoneuridae</i> sp.			
331.	<i>Raveniella peckorum</i>			
332.	<i>Rhantus suturalis</i>			
333.	<i>Scirtidae</i> sp.			
334.	<i>Simuliidae</i> sp.			
335.	<i>Sternopriscus</i> sp.			
336.	<i>Tabanidae</i> sp.			
337.	<i>Tamopsis distinguenda</i>			
338.	<i>Tamopsis perthensis</i>			
339.	<i>Tanypodinae</i> sp.			
340.	<i>Tasmanicosa leuckartii</i>			
341.	<i>Tetragnatha demissa</i>			
342.	<i>Tipulidae</i> sp.			
343.	<i>Urodacus novaehollandiae</i>			
344.	<i>Uvarus pictipes</i>			
345.	<i>Venator immansueta</i>			
346.	<i>Venatrix pullastra</i>			
347.	34113 <i>Westralunio carteri</i> (Carter's Freshwater Mussel)		T	
348.	<i>Zachria flavicoma</i>			

## Mammal

349.	24209 <i>Arctocephalus tropicalis</i> (Subantarctic fur-seal)		T	
350.	24162 <i>Bettongia penicillata</i> subsp. <i>ogilbyi</i> (Woylie, Brush-tailed Bettong)		T	
351.	24251 <i>Bos taurus</i> (European Cattle)	Y		
352.	24072 <i>Caperea marginata</i> (Pygmy Right Whale)			
353.	24086 <i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)			
354.	24092 <i>Dasyurus geoffroii</i> (Chuditch, Western Quoll)		T	
355.	24043 <i>Eubalaena australis</i> (Southern Right Whale)		T	
356.	24189 <i>Falsistrellus mackenziei</i> (Western False Pipistrelle, Western Falsistrelle)		□4	
357.	24056 <i>Grampus griseus</i> (Risso's Dolphin)			
358.	24215 <i>Hydromys chrysogaster</i> (Water-rat, Rakali)		□4	
359.	48588 <i>Isoodon fusciventer</i> (Quenda, southwestern brown bandicoot)		□4	
360.	24132 <i>Macropus fuliginosus</i> (Western Grey Kangaroo)			
361.	24051 <i>Megaptera novaeangliae</i> (Humpback Whale)		S	
362.	24076 <i>Mesoplodon bowdoini</i> (Andrew's Beaked Whale)			
363.	24078 <i>Mesoplodon grayi</i> (Gray's Beaked Whale)			
364.	24213 <i>Mirounga leonina</i> (Southern Elephant Seal)			
365.	24223 <i>Mus musculus</i> (House Mouse)	Y		
366.	48022 <i>Notamacropus irma</i> (Western Brush Wallaby)		□4	
367.	25508 <i>Phascogale tapoatafa</i> (Brush-tailed Phascogale)		S	
368.	48070 <i>Phascogale tapoatafa</i> subsp. <i>wambenger</i> (South-western Brush-tailed Phascogale, Wambenger)		S	
369.	24166 <i>Pseudocheirus occidentalis</i> (Western Ringtail Possum, ngwayir)		T	
370.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
371.	24145 <i>Setonix brachyurus</i> (Quokka)		T	
372.	24167 <i>Tarsipes rostratus</i> (Honey Possum, Noolbenger)			
373.	25521 <i>Trichosurus vulpecula</i> (Common Brushtail Possum)			
374.	24158 <i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum)			
375.	30954 <i>Tursiops aduncus</i> (Indo-Pacific Bottlenose Dolphin)			
376.	24069 <i>Tursiops truncatus</i> (Bottlenose Dolphin)			
377.	24206 <i>Vespadelus regulus</i> (Southern Forest Bat)			

## Reptile

378.	42368 <i>Acritoscincus trilineatus</i> (Western Three-lined Skink)			
379.	44629 <i>Anilius australis</i>			
380.	24990 <i>Aprasia pulchella</i> (Granite Worm-lizard)			

	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
381.	25335	<i>Caretta caretta</i> (Loggerhead Turtle)		T	
382.	25336	<i>Chelonia mydas</i> (Green Turtle)		T	
383.	24980	<i>Christinus marmoratus</i> (Marbled Gecko)			
384.	30893	<i>Cryptoblepharus buehneri</i>			
385.	25020	<i>Cryptoblepharus plagiocephalus</i>			
386.	25027	<i>Ctenotus australis</i>			
387.	25047	<i>Ctenotus impar</i>			
388.	25096	<i>Egernia kingii</i> (King's Skink)			
389.	25250	<i>Elapognathus coronatus</i> (Crowned Snake)			
390.	30919	<i>Hemiergis gracilipes</i> (skink)			
391.	25475	<i>Hemiergis peronii</i>			
392.	25118	<i>Hemiergis peronii</i> subsp. <i>tridactyla</i>			
393.	25119	<i>Hemiergis quadrilineata</i>			
394.	43384	<i>Hydrophis platurus</i> (Yellow-bellied Seasnake)			
395.	25131	<i>Lerista distinguenda</i>			
396.	25133	<i>Lerista elegans</i>			
397.	25005	<i>Lialis burtonis</i>			
398.	42413	<i>Lissolepis luctuosa</i> (Western Swamp Skink)			
399.	25184	<i>Menetia greyii</i>			
400.	25240	<i>Morelia spilota</i> subsp. <i>imbricata</i> (Carpet Python)			
401.	25191	<i>Morethia lineocellata</i>			
402.	25252	<i>Notechis scutatus</i> (Tiger Snake)			
403.	25255	<i>Parasuta nigriceps</i>			
404.	24907	<i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
405.	25511	<i>Pseudonaja affinis</i> (Dugite)			
406.	25259	<i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
407.	25519	<i>Tiliqua rugosa</i>			
408.	25207	<i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			
409.	25218	<i>Varanus gouldii</i> (Bungarra or Sand Monitor)			
410.	25225	<i>Varanus rosenbergi</i> (Heath Monitor)			

#### Conservation Codes

T ☐ Rare or likely to become extinct  
☐ Resumed 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: 27/08/19 19:52:41

[Summary](#)

[Details](#)

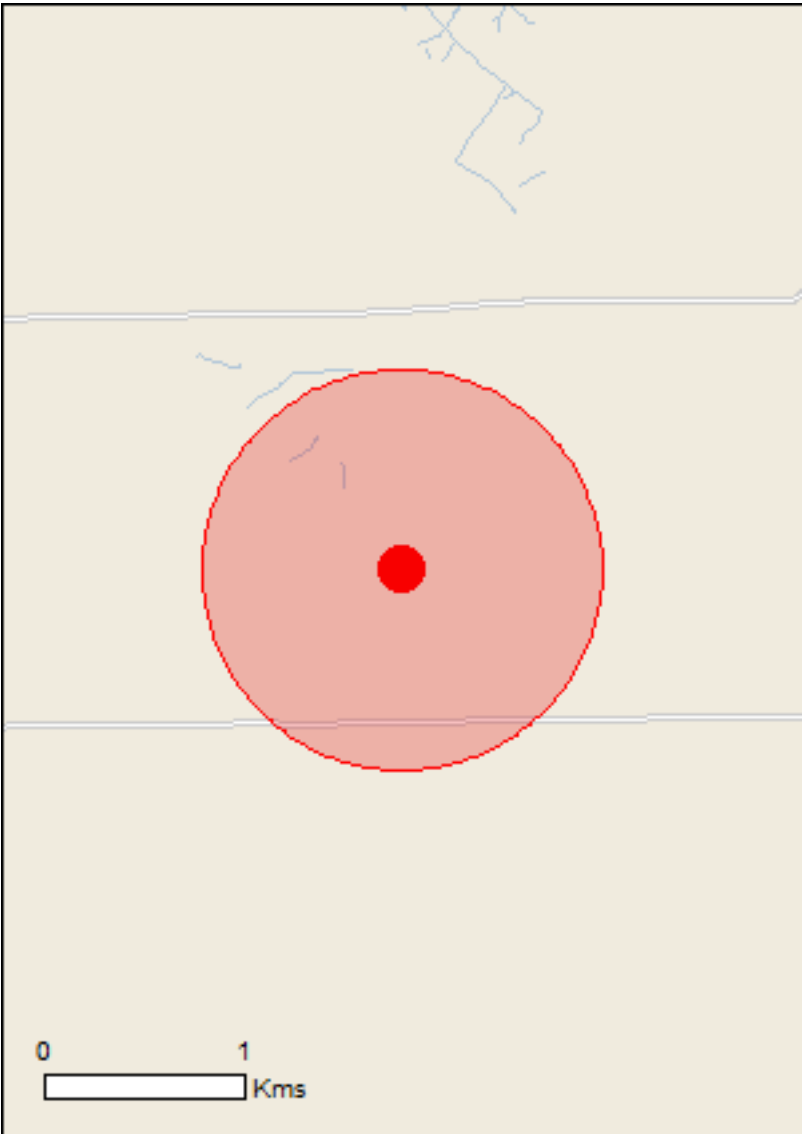
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



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Buffer: 1.0Km





# Summary

## Matters of National Environmental Significance

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

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	1
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	2
<a href="#">Listed Threatened Species:</a>	27
<a href="#">Listed Migratory Species:</a>	10

## 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>	24
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)		[ Resource Information ]
Name		Proximity
<a href="#">Vasse-wonnerup system</a>		Within 10km of Ramsar

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

Name	Status	Type of Presence
<a href="#">Banksia Woodlands of the Swan Coastal Plain ecological community</a>	Endangered	Community may 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
Birds		
<a href="#">Botaurus poiciloptilus</a> Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Calyptorhynchus baudinii</a> Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Endangered	Breeding known to occur within area
<a href="#">Calyptorhynchus latirostris</a> Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Breeding likely to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
Fish		
<a href="#">Nannatherina balstoni</a> Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat may occur within area
Mammals		

Name	Status	Type of Presence
<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, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat may occur within area
Plants		
<a href="#">Andersonia gracilis</a> Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
<a href="#">Banksia nivea subsp. uliginosa</a> Swamp Honeypot [82766]	Endangered	Species or species habitat likely to occur within area
<a href="#">Banksia squarrosa subsp. argillacea</a> Whicher Range Dryandra [82769]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Brachyscias verecundus</a> Ironstone Brachyscias [81321]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Caladenia busselliana</a> Bussell's Spider-orchid [24369]	Endangered	Species or species habitat likely to occur within area
<a href="#">Caladenia huegelii</a> King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat may occur within area
<a href="#">Chamelaucium sp. S coastal plain (R.D.Royce 4872)</a> Royce's Waxflower [87814]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Diuris micrantha</a> Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area
<a href="#">Drakaea elastica</a> Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
<a href="#">Drakaea micrantha</a> Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area
<a href="#">Gastrolobium papilio</a> Butterfly-leaved Gastrolobium [78415]	Endangered	Species or species habitat may occur within area
<a href="#">Lambertia echinata subsp. occidentalis</a> Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat may occur within area
<a href="#">Petrophile latericola</a> Laterite Petrophile [64532]	Endangered	Species or species habitat likely to occur within area
<a href="#">Synaphea sp. Fairbridge Farm (D. Papenfus 696)</a> Selena's Synaphea [82881]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Verticordia densiflora var. pedunculata</a> Long-stalked Featherflower [55689]	Endangered	Species or species habitat may occur within area
<a href="#">Verticordia plumosa var. vassensis</a> Vasse Featherflower [55804]	Endangered	Species or species habitat likely to occur within area

Listed Migratory Species		[ Resource Information ]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat 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="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat may occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

### Other Matters Protected by the EPBC Act

Listed Marine Species		[ Resource Information ]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Breeding known to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area



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="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

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

Name	Status	Type of Presence
Birds		
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
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Mammals		



Name	Status	Type of Presence
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
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
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area

Name	Status	Type of Presence
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

# Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

# Coordinates

-33.69454 115.46617

# 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 &gt;50cm

Datum - GDA94

Entrance Size Ranges - Small = &gt;5cm, Medium = 5 to 10cm, Large = &gt;10cm

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt001	50H	355532	6271667	Marri	15-20	>50	0					
wpt002	50H	355549	6271670	Marri	15-20	>50	0					
wpt003	50H	355576	6271671	Flooded Gum	15-20	>50	0					
wpt004	50H	355625	6271675	Flooded Gum	15-20	>50	0					
wpt005	50H	355656	6271674	Flooded Gum	15-20	>50	0					
wpt006	50H	355670	6271674	Jarrah	15-20	>50	0					
wpt007	50H	355742	6271661	Unknown Euc	20+	>50	0					
wpt008	50H	355746	6271663	Unknown Euc	20+	>50	0					
wpt009	50H	355755	6271664	Unknown Euc	20+	>50	0					
wpt010	50H	355769	6271663	Unknown Euc	20+	>50	0					
wpt011	50H	355764	6271663	Dead Unknown	15-20	>50	0					
wpt012	50H	355811	6271679	Marri	15-20	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	Galahs	Yes	Chew marks possibly galah? Knot Hole
wpt013	50H	355822	6271665	Marri	15-20	>50	0					
wpt014	50H	355803	6271667	Marri	15-20	>50	0					
wpt015	50H	356326	6271675	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt016	50H	356391	6271694	Flooded Gum	15-20	>50	0					
wpt017	50H	356398	6271694	Flooded Gum	15-20	>50	0					
wpt018	50H	356449	6271686	Marri	15-20	>50	0					
wpt019	50H	356461	6271682	Flooded Gum	10-15	>50	2+	Small, Medium & Large (Cockatoo)	Bees	No Signs	Yes	Chimney
wpt020	50H	356460	6271695	Marri	15-20	>50	0					
wpt021	50H	356463	6271695	Flooded Gum	15-20	>50	0					
wpt022	50H	356481	6271696	Flooded Gum	15-20	>50	0					
wpt023	50H	356510	6271680	Flooded Gum	15-20	>50	0					
wpt024	50H	356589	6271699	Flooded Gum	20+	>50	0					
wpt025	50H	356556	6271694	Flooded Gum	15-20	>50	0					
wpt026	50H	356562	6271688	Marri	15-20	>50	0					
wpt027	50H	356556	6271683	Marri	15-20	>50	0					
wpt028	50H	356600	6271683	Flooded Gum	15-20	>50	0					
wpt029	50H	356601	6271683	Flooded Gum	20+	>50	0					
wpt030	50H	356677	6271686	Flooded Gum	20+	>50	0					
wpt031	50H	356679	6271687	Flooded Gum	15-20	>50	0					
wpt032	50H	356679	6271688	Flooded Gum	15-20	>50	0					
wpt033	50H	356684	6271684	Marri	20+	>50	0					
wpt034	50H	356701	6271687	Flooded Gum	20+	>50	0					
wpt035	50H	356722	6271687	Dead Unknown	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt036	50H	356816	6271688	Flooded Gum	15-20	>50	0					
wpt037	50H	356844	6271690	Flooded Gum	15-20	>50	0					
wpt038	50H	356913	6271692	Marri	15-20	>50	0					
wpt039	50H	356976	6271706	Flooded Gum	15-20	>50	0					
wpt040	50H	356952	6271706	Flooded Gum	15-20	>50	0					
wpt041	50H	356920	6271695	Flooded Gum	20+	>50	0					
wpt042	50H	356912	6271707	Flooded Gum	15-20	>50	0					
wpt043	50H	356882	6271705	Flooded Gum	15-20	>50	0					
wpt044	50H	356865	6271693	Flooded Gum	20+	>50	0					
wpt045	50H	356833	6271706	Marri	15-20	>50	0					
wpt046	50H	356831	6271707	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt047	50H	356831	6271694	Flooded Gum	20+	>50	0					
wpt048	50H	356806	6271702	Marri	15-20	>50	0					
wpt049	50H	356764	6271701	Flooded Gum	15-20	>50	0					
wpt050	50H	356721	6271700	Flooded Gum	15-20	>50	0					
wpt051	50H	356709	6271701	Flooded Gum	15-20	>50	0					
wpt052	50H	356701	6271702	Flooded Gum	15-20	>50	0					
wpt053	50H	356667	6271700	Flooded Gum	15-20	>50	0					
wpt054	50H	356652	6271691	Flooded Gum	15-20	>50	0					
wpt055	50H	356638	6271698	Flooded Gum	15-20	>50	0					
wpt056	50H	356634	6271687	Marri	15-20	>50	1	Large (Cockatoo)	No Signs	No Signs	Yes	Knot Hole
wpt057	50H	356627	6271698	Flooded Gum	15-20	>50	0					
wpt058	50H	356623	6271688	Flooded Gum	15-20	>50	0					
wpt059	50H	356615	6271697	Flooded Gum	15-20	>50	0					
wpt060	50H	356613	6271691	Marri	15-20	>50	0					
wpt061	50H	357221	6271717	Flooded Gum	15-20	>50	0					
wpt062	50H	357216	6271698	Marri	15-20	>50	0					
wpt063	50H	357229	6271707	Marri	15-20	>50	0					
wpt064	50H	357243	6271711	Marri	15-20	>50	0					
wpt065	50H	357388	6271708	Flooded Gum	15-20	>50	0					
wpt066	50H	357392	6271719	Flooded Gum	15-20	>50	0					
wpt067	50H	357397	6271723	Flooded Gum	15-20	>50	0					
wpt068	50H	357414	6271724	Flooded Gum	15-20	>50	0					
wpt069	50H	357441	6271702	Flooded Gum	15-20	>50	0					
wpt070	50H	357415	6271703	Flooded Gum	15-20	>50	0					
wpt071	50H	357551	6271722	Flooded Gum	15-20	>50	0					
wpt072	50H	357544	6271711	Flooded Gum	15-20	>50	0					
wpt073	50H	357574	6271722	Flooded Gum	15-20	>50	0					
wpt074	50H	357598	6271724	Flooded Gum	15-20	>50	0					
wpt075	50H	357611	6271714	Marri	15-20	>50	0					
wpt076	50H	357634	6271726	Marri	15-20	>50	0					
wpt077	50H	357638	6271727	Marri	15-20	>50	0					
wpt078	50H	357652	6271726	Marri	15-20	>50	0					
wpt079	50H	357659	6271718	Marri	15-20	>50	0					
wpt080	50H	357661	6271727	Marri	15-20	>50	0					
wpt081	50H	357674	6271730	Marri	15-20	>50	0					
wpt082	50H	357687	6271731	Marri	15-20	>50	0					
wpt083	50H	357725	6271721	Marri	15-20	>50	0					
wpt084	50H	357825	6271741	Unknown Euc	15-20	>50	0					
wpt085	50H	357877	6271744	Unknown Euc	15-20	>50	0					
wpt086	50H	358329	6271775	Marri	15-20	>50	0					
wpt087	50H	358328	6271783	Marri	15-20	>50	0					
wpt088	50H	358723	6271792	Marri	15-20	>50	0					
wpt089	50H	358726	6271782	Marri	15-20	>50	0					
wpt090	50H	358740	6271790	Dead Unknown	15-20	>50	0					
wpt091	50H	358744	6271793	Marri	15-20	>50	0					
wpt092	50H	358740	6271779	Dead Unknown	15-20	>50	0					
wpt093	50H	358829	6271780	Marri	15-20	>50	0					
wpt094	50H	358835	6271779	Marri	15-20	>50	0					
wpt095	50H	358895	6271783	Marri	15-20	>50	0					
wpt096	50H	358890	6271794	Marri	15-20	>50	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt097	50H	358886	6271794	Marri	15-20	>50	0					
wpt098	50H	358922	6271779	Dead Unknown	15-20	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt099	50H	358926	6271794	Marri	15-20	>50	0					
wpt100	50H	358939	6271795	Marri	15-20	>50	0					
wpt1000	50H	358306	6270714	Unknown Euc	15-20	>50	0					
wpt1001	50H	357998	6270747	Unknown Euc	15-20	>50	0					
wpt1002	50H	357998	6270761	Unknown Euc	15-20	>50	0					
wpt1003	50H	357998	6270779	Unknown Euc	15-20	>50	0					
wpt1004	50H	357997	6270797	Unknown Euc	15-20	>50	0					
wpt1005	50H	357998	6270816	Unknown Euc	15-20	>50	0					
wpt1006	50H	357879	6270837	Unknown Euc	15-20	>50	0					
wpt1007	50H	357924	6270838	Unknown Euc	15-20	>50	0					
wpt1008	50H	357938	6270837	Unknown Euc	15-20	>50	0					
wpt1009	50H	357948	6270835	Unknown Euc	15-20	>50	0					
wpt101	50H	358999	6271782	Marri	15-20	>50	1	Large (Cockatoo)	No Signs	No Signs	Yes	Spout
wpt1010	50H	357964	6270838	Unknown Euc	15-20	>50	0					
wpt1011	50H	357984	6270838	Unknown Euc	15-20	>50	0					
wpt1012	50H	357993	6270838	Unknown Euc	15-20	>50	0					
wpt1013	50H	358010	6270838	Unknown Euc	15-20	>50	0					
wpt1014	50H	358025	6270838	Unknown Euc	15-20	>50	0					
wpt1015	50H	358033	6270838	Unknown Euc	15-20	>50	0					
wpt1016	50H	358042	6270838	Unknown Euc	15-20	>50	0					
wpt1017	50H	358053	6270838	Unknown Euc	15-20	>50	0					
wpt1018	50H	358067	6270839	Unknown Euc	15-20	>50	0					
wpt1019	50H	358082	6270842	Unknown Euc	15-20	>50	0					
wpt102	50H	359057	6271797	Marri	15-20	>50	0					
wpt1020	50H	358096	6270840	Unknown Euc	15-20	>50	0					
wpt1021	50H	358106	6270840	Unknown Euc	15-20	>50	0					
wpt1022	50H	358116	6270841	Unknown Euc	15-20	>50	0					
wpt1023	50H	358129	6270843	Unknown Euc	15-20	>50	0					
wpt1024	50H	358139	6270843	Unknown Euc	15-20	>50	0					
wpt1025	50H	358147	6270842	Unknown Euc	15-20	>50	0					
wpt1026	50H	358156	6270841	Unknown Euc	15-20	>50	0					
wpt1027	50H	358168	6270840	Unknown Euc	15-20	>50	0					
wpt1028	50H	358175	6270842	Unknown Euc	15-20	>50	0					
wpt1029	50H	358185	6270843	Unknown Euc	15-20	>50	0					
wpt103	50H	359220	6271791	Marri	15-20	>50	0					
wpt1030	50H	358192	6270843	Unknown Euc	15-20	>50	0					
wpt1031	50H	358200	6270844	Unknown Euc	15-20	>50	0					
wpt1032	50H	358208	6270844	Unknown Euc	15-20	>50	0					
wpt1033	50H	358220	6270844	Unknown Euc	15-20	>50	0					
wpt1034	50H	358232	6270844	Unknown Euc	15-20	>50	0					
wpt1035	50H	358242	6270844	Unknown Euc	15-20	>50	0					
wpt1036	50H	358248	6270845	Unknown Euc	15-20	>50	0					
wpt1037	50H	358261	6270845	Unknown Euc	15-20	>50	0					
wpt1038	50H	358274	6270845	Unknown Euc	15-20	>50	0					
wpt1039	50H	358285	6270847	Unknown Euc	15-20	>50	0					
wpt104	50H	359226	6271800	Marri	15-20	>50	0					
wpt1040	50H	358297	6270846	Unknown Euc	15-20	>50	0					
wpt1041	50H	358313	6270847	Unknown Euc	15-20	>50	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt1042	50H	358348	6270849	Unknown Euc	15-20	>50	0					
wpt1043	50H	359873	6271684	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt1044	50H	359873	6271672	Dead Unknown	20+	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt1045	50H	358370	6269743	Unknown Euc	15-20	>50	0					
wpt1046	50H	358405	6269745	Unknown Euc	15-20	>50	0					
wpt1047	50H	358424	6269745	Unknown Euc	15-20	>50	0					
wpt1048	50H	358458	6269745	Unknown Euc	15-20	>50	0					
wpt1049	50H	358471	6269745	Unknown Euc	15-20	>50	0					
wpt105	50H	359215	6271799	Marri	15-20	>50	0					
wpt1050	50H	358479	6269745	Unknown Euc	15-20	>50	0					
wpt1051	50H	358488	6269745	Unknown Euc	15-20	>50	0					
wpt1052	50H	358495	6269745	Unknown Euc	15-20	>50	0					
wpt1053	50H	358500	6269745	Unknown Euc	15-20	>50	0					
wpt106	50H	359207	6271801	Marri	15-20	>50	0					
wpt107	50H	359199	6271786	Dead Unknown	15-20	>50	0					
wpt108	50H	359285	6271799	Marri	15-20	>50	0					
wpt109	50H	359265	6271789	Marri	15-20	>50	0					
wpt110	50H	359619	6270084	Unknown Euc	15-20	>50	0					
wpt111	50H	359623	6270091	Unknown Euc	15-20	>50	0					
wpt112	50H	359301	6270058	Marri	15-20	>50	0					
wpt113	50H	359292	6270054	Marri	15-20	>50	0					
wpt114	50H	359072	6270063	Marri	15-20	>50	0					
wpt115	50H	359045	6270062	Marri	15-20	>50	0					
wpt116	50H	359031	6270061	Marri	15-20	>50	0					
wpt117	50H	359028	6270051	Marri	15-20	>50	0					
wpt118	50H	359016	6270063	Marri	15-20	>50	0					
wpt119	50H	358992	6270060	Marri	15-20	>50	0					
wpt120	50H	358982	6270058	Marri	15-20	>50	0					
wpt121	50H	358968	6270062	Marri	20+	>50	0					
wpt122	50H	358956	6270060	Marri	15-20	>50	0					
wpt123	50H	358916	6270058	Marri	15-20	>50	0					
wpt124	50H	358910	6270047	Marri	20+	>50	0					
wpt125	50H	358976	6270048	Marri	20+	>50	0					
wpt126	50H	358997	6270037	Flooded Gum	15-20	>50	0					
wpt127	50H	358892	6270062	Marri	15-20	>50	0					
wpt128	50H	358880	6270058	Marri	15-20	>50	0					
wpt129	50H	358855	6270060	Marri	20+	>50	0					
wpt130	50H	358841	6270058	Marri	20+	>50	0					
wpt131	50H	358799	6270057	Marri	15-20	>50	0					
wpt132	50H	358778	6270054	Marri	15-20	>50	0					
wpt133	50H	358761	6270057	Marri	15-20	>50	0					
wpt134	50H	358749	6270054	Marri	20+	>50	0					
wpt135	50H	358736	6270055	Marri	15-20	>50	0					
wpt136	50H	358723	6270055	Marri	20+	>50	0					
wpt137	50H	358701	6270052	Marri	20+	>50	0					
wpt138	50H	358683	6270056	Marri	15-20	>50	0					
wpt139	50H	358673	6270056	Marri	15-20	>50	0					
wpt140	50H	358736	6270039	Marri	15-20	>50	0					
wpt141	50H	358459	6270043	Marri	15-20	>50	0					
wpt142	50H	358456	6270047	Marri	15-20	>50	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt143	50H	358453	6270045	Marri	15-20	>50	0					
wpt144	50H	358423	6270048	Marri	15-20	>50	0					
wpt145	50H	358366	6270031	Unknown Euc	20+	>50	0					
wpt146	50H	358370	6270031	Unknown Euc	20+	>50	0					
wpt147	50H	358376	6270030	Unknown Euc	20+	>50	0					
wpt148	50H	358380	6270030	Unknown Euc	20+	>50	0					
wpt149	50H	358385	6270030	Unknown Euc	20+	>50	0					
wpt150	50H	358392	6270030	Unknown Euc	20+	>50	0					
wpt151	50H	358399	6270031	Unknown Euc	20+	>50	0					
wpt152	50H	358404	6270031	Unknown Euc	20+	>50	0					
wpt153	50H	358302	6270028	Marri	15-20	>50	0					
wpt154	50H	358289	6270030	Marri	20+	>50	0					
wpt155	50H	358259	6270029	Marri	20+	>50	0					
wpt156	50H	358254	6270025	Marri	20+	>50	0					
wpt157	50H	358249	6270027	Marri	15-20	>50	0					
wpt158	50H	358240	6270030	Jarrah	15-20	>50	0					
wpt159	50H	358215	6270029	Marri	15-20	>50	0					
wpt160	50H	358173	6270027	Marri	15-20	>50	0					
wpt161	50H	358160	6270039	Dead Jarrah	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt162	50H	358171	6270040	Marri	15-20	>50	0					
wpt163	50H	358174	6270041	Marri	15-20	>50	0					
wpt164	50H	358230	6270039	Jarrah	10-15	>50	0					
wpt165	50H	358081	6270027	Marri	15-20	>50	0					
wpt166	50H	358092	6270024	Dead Marri	15-20	>50	0					
wpt167	50H	358026	6270018	Marri	5-10	>50	0					
wpt168	50H	357970	6270033	Marri	20+	>50	0					
wpt169	50H	357960	6270034	Jarrah	15-20	>50	0					
wpt170	50H	357930	6270021	Marri	20+	>50	0					
wpt171	50H	357947	6270020	Marri	20+	>50	0					
wpt172	50H	357955	6270022	Marri	15-20	>50	0					
wpt173	50H	357968	6270021	Marri	15-20	>50	0					
wpt174	50H	357630	6270014	Marri	15-20	>50	0					
wpt175	50H	357604	6270015	Marri	15-20	>50	0					
wpt176	50H	357586	6270015	Jarrah	15-20	>50	0					
wpt177	50H	357551	6270008	Marri	20+	>50	0					
wpt178	50H	357537	6270009	Marri	20+	>50	0					
wpt179	50H	357528	6270009	Marri	20+	>50	0					
wpt180	50H	357511	6270009	Marri	15-20	>50	0					
wpt181	50H	357494	6270011	Marri	20+	>50	0					
wpt182	50H	357456	6270007	Dead Marri	5-10	>50	0					
wpt183	50H	357445	6270011	Marri	15-20	>50	0					
wpt184	50H	357435	6270005	Marri	15-20	>50	0					
wpt185	50H	357432	6270007	Marri	15-20	>50	0					
wpt186	50H	357410	6270018	Marri	15-20	>50	0					
wpt187	50H	357412	6270020	Marri	15-20	>50	0					
wpt188	50H	357437	6270023	Marri	15-20	>50	0					
wpt189	50H	357450	6270020	Marri	15-20	>50	0					
wpt190	50H	357494	6270019	Dead Marri	5-10	>50	0					
wpt191	50H	357509	6270019	Dead Marri	5-10	>50	1	Medium	No Signs	No Signs	No	
wpt192	50H	357512	6270018	Marri	15-20	>50	0					



Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt193	50H	357523	6270019	Marri	15-20	>50	0					
wpt194	50H	357525	6270021	Marri	15-20	>50	0					
wpt195	50H	357542	6270018	Marri	15-20	>50	0					
wpt196	50H	357559	6270020	Marri	20+	>50	0					
wpt197	50H	357592	6270020	Marri	15-20	>50	0					
wpt198	50H	357595	6270020	Marri	20+	>50	0					
wpt199	50H	357605	6270020	Marri	15-20	>50	0					
wpt200	50H	357616	6270021	Marri	15-20	>50	0					
wpt201	50H	357625	6270023	Marri	15-20	>50	0					
wpt202	50H	357639	6270022	Dead Marri	5-10	>50	0					
wpt203	50H	357651	6270022	Marri	15-20	>50	0					
wpt204	50H	357371	6270014	Marri	20+	>50	2+	Small & Medium	Bees	No Signs	No	
wpt205	50H	357375	6270001	Marri	15-20	>50	0					
wpt206	50H	357351	6270004	Dead Unknown	15-20	>50	0					
wpt207	50H	357349	6270003	Dead Unknown	15-20	>50	0					
wpt208	50H	357322	6270004	Dead Unknown	15-20	>50	0					
wpt209	50H	357309	6270001	Marri	20+	>50	0					
wpt210	50H	357302	6270001	Marri	20+	>50	0					
wpt211	50H	357294	6269999	Marri	20+	>50	0					
wpt212	50H	357288	6270001	Dead Unknown	15-20	>50	0					
wpt213	50H	357280	6270003	Marri	20+	>50	0					
wpt214	50H	357257	6270003	Marri	20+	>50	0					
wpt215	50H	357280	6270015	Marri	20+	>50	0					
wpt216	50H	357289	6270016	Marri	20+	>50	0					
wpt217	50H	357303	6270013	Marri	15-20	>50	0					
wpt218	50H	357309	6270014	Marri	15-20	>50	0					
wpt219	50H	357312	6270015	Marri	15-20	>50	0					
wpt220	50H	357337	6270014	Marri	15-20	>50	0					
wpt221	50H	357353	6270013	Marri	15-20	>50	0					
wpt222	50H	357361	6270015	Marri	15-20	>50	0					
wpt223	50H	357226	6270001	Marri	15-20	>50	0					
wpt224	50H	357201	6270002	Marri	15-20	>50	0					
wpt225	50H	357183	6269999	Marri	15-20	>50	0					
wpt226	50H	357156	6269998	Marri	15-20	>50	0					
wpt227	50H	357073	6270000	Marri	15-20	>50	0					
wpt228	50H	357048	6269995	Marri	15-20	>50	0					
wpt229	50H	357073	6270007	Marri	15-20	>50	0					
wpt230	50H	357102	6270012	Marri	15-20	>50	0					
wpt231	50H	357165	6270011	Marri	15-20	>50	0					
wpt232	50H	357007	6269994	Flooded Gum	15-20	>50	0					
wpt233	50H	356998	6269995	Marri	15-20	>50	0					
wpt234	50H	356989	6269999	Flooded Gum	15-20	>50	0					
wpt235	50H	356980	6269998	Flooded Gum	20+	>50	1	Medium	No Signs	No Signs	No	
wpt236	50H	356974	6269991	Flooded Gum	15-20	>50	0					
wpt237	50H	356966	6269991	Flooded Gum	15-20	>50	0					
wpt238	50H	356957	6269995	Marri	15-20	>50	0					
wpt239	50H	356940	6269994	Marri	20+	>50	0					
wpt240	50H	356939	6269994	Marri	20+	>50	0					
wpt241	50H	356925	6269991	Marri	20+	>50	0					
wpt242	50H	356921	6269994	Flooded Gum	15-20	>50	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt243	50H	356901	6269999	Marri	20+	>50	0					
wpt244	50H	356887	6269994	Marri	5-10	>50	0					
wpt245	50H	356867	6269994	Marri	20+	>50	0					
wpt246	50H	356862	6269993	Marri	20+	>50	0					
wpt247	50H	356856	6269990	Marri	15-20	>50	0					
wpt248	50H	356853	6269993	Flooded Gum	15-20	>50	0					
wpt249	50H	356812	6269995	Flooded Gum	20+	>50	0					
wpt250	50H	356847	6270000	Flooded Gum	15-20	>50	0					
wpt251	50H	356891	6270002	Flooded Gum	15-20	>50	0					
wpt252	50H	356773	6269984	Flooded Gum	15-20	>50	0					
wpt253	50H	356750	6269988	Flooded Gum	15-20	>50	1	Large (Cockatoo)	No Signs	No Signs	Yes	Spout - possibly too low
wpt254	50H	356706	6269982	Flooded Gum	15-20	>50	0					
wpt255	50H	356657	6269989	Flooded Gum	15-20	>50	0					
wpt256	50H	356647	6269989	Flooded Gum	15-20	>50	0					
wpt257	50H	356632	6269990	Flooded Gum	15-20	>50	0					
wpt258	50H	356616	6269996	Flooded Gum	15-20	>50	0					
wpt259	50H	361258	6271599	Marri	15-20	>50	0					
wpt260	50H	361261	6271609	Marri	15-20	>50	0					
wpt261	50H	361260	6271609	Marri	15-20	>50	0					
wpt262	50H	361259	6271620	Marri	15-20	>50	0					
wpt263	50H	361259	6271631	Marri	15-20	>50	0					
wpt264	50H	361257	6271646	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt265	50H	361259	6271726	Marri	15-20	>50	0					
wpt266	50H	361257	6271732	Marri	15-20	>50	0					
wpt267	50H	361257	6271743	Marri	15-20	>50	0					
wpt268	50H	361269	6271742	Marri	15-20	>50	0					
wpt269	50H	361268	6271736	Marri	20+	>50	0					
wpt270	50H	361272	6271722	Marri	15-20	>50	0					
wpt271	50H	361268	6271698	Marri	15-20	>50	0					
wpt272	50H	361270	6271688	Marri	10-15	>50	0					
wpt273	50H	361269	6271687	Marri	15-20	>50	0					
wpt274	50H	361253	6272265	Marri	15-20	>50	0					
wpt275	50H	361233	6272265	Marri	15-20	>50	0					
wpt276	50H	361227	6272261	Marri	15-20	>50	0					
wpt277	50H	361208	6272259	Marri	15-20	>50	0					
wpt278	50H	361199	6272265	Dead Unknown	15-20	>50	2+	Small & Medium	28 Parrot	No Signs	No	
wpt279	50H	361193	6272265	Marri	15-20	>50	0					
wpt280	50H	361175	6272261	Marri	20+	>50	0					
wpt281	50H	361171	6272263	Marri	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	Dying
wpt282	50H	361158	6272262	Marri	15-20	>50	0					
wpt283	50H	361151	6272259	Marri	15-20	>50	0					
wpt284	50H	361153	6272259	Marri	15-20	>50	0					
wpt285	50H	361148	6272263	Marri	15-20	>50	0					
wpt286	50H	361155	6272275	Marri	15-20	>50	0					
wpt287	50H	361176	6272277	Dead Unknown	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt288	50H	361209	6272276	Marri	15-20	>50	0					
wpt289	50H	361087	6272261	Marri	15-20	>50	0					
wpt290	50H	361081	6272262	Marri	15-20	>50	0					
wpt291	50H	361074	6272259	Marri	15-20	>50	0					
wpt292	50H	360907	6272258	Marri	15-20	>50	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt293	50H	360890	6272269	Marri	15-20	>50	0					
wpt294	50H	360831	6272268	Marri	15-20	>50	0					
wpt295	50H	360802	6272254	Marri	15-20	>50	0					
wpt296	50H	360789	6272254	Marri	15-20	>50	0					
wpt297	50H	360789	6272267	Marri	15-20	>50	0					
wpt298	50H	360770	6272268	Marri	15-20	>50	0					
wpt299	50H	360746	6272267	Marri	15-20	>50	0					
wpt300	50H	360730	6272269	Marri	15-20	>50	0					
wpt301	50H	360651	6272266	Marri	15-20	>50	0					
wpt302	50H	360625	6272255	Unknown Euc	20+	>50	0					
wpt303	50H	360640	6272252	Marri	15-20	>50	0					
wpt304	50H	360644	6272256	Marri	15-20	>50	0					
wpt305	50H	360673	6272259	Marri	15-20	>50	0					
wpt306	50H	360708	6272258	Marri	15-20	>50	0					
wpt307	50H	360721	6272257	Marri	15-20	>50	0					
wpt308	50H	360727	6272257	Marri	15-20	>50	0					
wpt309	50H	360733	6272256	Flooded Gum	15-20	>50	0					
wpt310	50H	360738	6272253	Marri	15-20	>50	0					
wpt311	50H	360745	6272254	Marri	15-20	>50	0					
wpt312	50H	360755	6272256	Marri	15-20	>50	0					
wpt313	50H	360763	6272258	Marri	15-20	>50	0					
wpt314	50H	360769	6272254	Jarraah	15-20	>50	0					
wpt315	50H	360473	6272253	Marri	15-20	>50	0					
wpt316	50H	360438	6272253	Marri	15-20	>50	0					
wpt317	50H	360406	6272251	Marri	20+	>50	0					
wpt318	50H	360395	6272252	Marri	15-20	>50	0					
wpt319	50H	360388	6272251	Marri	15-20	>50	0					
wpt320	50H	360377	6272253	Marri	20+	>50	0					
wpt321	50H	360358	6272251	Marri	20+	>50	0					
wpt322	50H	360340	6272249	Marri	20+	>50	0					
wpt323	50H	360324	6272249	Marri	20+	>50	0					
wpt324	50H	360321	6272250	Marri	15-20	>50	0					
wpt325	50H	360315	6272249	Marri	15-20	>50	0					
wpt326	50H	360305	6272248	Marri	15-20	>50	0					
wpt327	50H	360299	6272263	Marri	15-20	>50	0					
wpt328	50H	360306	6272260	Marri	15-20	>50	0					
wpt329	50H	360320	6272261	Marri	10-15	>50	0					
wpt330	50H	360329	6272263	Marri	20+	>50	0					
wpt331	50H	360329	6272263	Marri	15-20	>50	0					
wpt332	50H	360337	6272260	Marri	15-20	>50	0					
wpt333	50H	360359	6272259	Marri	15-20	>50	0					
wpt334	50H	360367	6272260	Marri	15-20	>50	0					
wpt335	50H	360376	6272260	Marri	20+	>50	2+	Small	No Signs	No Signs	No	
wpt336	50H	360400	6272263	Marri	15-20	>50	0					
wpt337	50H	360416	6272265	Marri	15-20	>50	0					
wpt338	50H	359491	6272074	Marri	15-20	>50	0					
wpt339	50H	358583	6271749	Unknown Euc	15-20	>50	0					
wpt340	50H	358571	6271751	Unknown Euc	15-20	>50	0					
wpt341	50H	358566	6271751	Unknown Euc	15-20	>50	0					
wpt342	50H	358543	6271759	Unknown Euc	15-20	>50	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt343	50H	358564	6271733	Unknown Euc	15-20	>50	0					
wpt344	50H	358572	6271732	Unknown Euc	15-20	>50	0					
wpt345	50H	358546	6271699	Unknown Euc	15-20	>50	0					
wpt346	50H	358580	6271701	Unknown Euc	15-20	>50	0					
wpt347	50H	358582	6271691	Unknown Euc	15-20	>50	0					
wpt348	50H	358595	6271691	Unknown Euc	15-20	>50	0					
wpt349	50H	358612	6271664	Marri	15-20	>50	0					
wpt350	50H	358612	6271653	Marri	20+	>50	0					
wpt351	50H	358615	6271493	Marri	15-20	>50	0					
wpt352	50H	358620	6271450	Marri	15-20	>50	0					
wpt353	50H	358619	6271400	Marri	15-20	>50	0					
wpt354	50H	358611	6271370	Marri	15-20	>50	0					
wpt355	50H	358608	6271369	Marri	15-20	>50	0					
wpt356	50H	358621	6271346	Marri	15-20	>50	0					
wpt357	50H	358620	6271301	Marri	15-20	>50	0					
wpt358	50H	358619	6271287	Marri	15-20	>50	0					
wpt359	50H	358636	6271291	Marri	15-20	>50	0					
wpt360	50H	358625	6271283	Dead Unknown	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt361	50H	358632	6271280	Marri	15-20	>50	0					
wpt362	50H	358651	6271266	Dead Unknown	10-15	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt363	50H	358660	6271269	Marri	15-20	>50	0					
wpt364	50H	358672	6271257	Marri	15-20	>50	0					
wpt365	50H	358702	6271225	Marri	15-20	>50	0					
wpt366	50H	358701	6271210	Marri	15-20	>50	0					
wpt367	50H	358704	6271202	Dead Unknown	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt368	50H	358699	6271190	Dead Jarrah	15-20	>50	2+	Small, Medium & Large	No Signs	No Signs	No	Examined with drone - no suitable hollows
wpt369	50H	358724	6271178	Dead Unknown	5-10	>50	1	Large	No Signs	No Signs	No	Examined with drone - too shallow
wpt370	50H	358730	6271189	Jarrah	15-20	>50	2+	Small & Medium	28 Parrot	No Signs	No	
wpt371	50H	358744	6271167	Marri	15-20	>50	0					
wpt372	50H	358743	6271154	Marri	15-20	>50	0					
wpt373	50H	358761	6271156	Marri	15-20	>50	0					
wpt374	50H	358772	6271141	Marri	15-20	>50	0					
wpt375	50H	358770	6271112	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt376	50H	358791	6271103	Marri	15-20	>50	0					
wpt377	50H	358806	6271094	Marri	15-20	>50	0					
wpt378	50H	358819	6271093	Marri	15-20	>50	0					
wpt379	50H	358818	6271095	Marri	15-20	>50	0					
wpt380	50H	358616	6271311	Marri	15-20	>50	0					
wpt381	50H	358613	6271524	Marri	15-20	>50	0					
wpt382	50H	358608	6271516	Marri	15-20	>50	0					
wpt383	50H	358966	6270972	Marri	20+	>50	2+	Small	No Signs	No Signs	No	
wpt384	50H	358987	6270970	Marri	20+	>50	0					
wpt385	50H	358983	6270948	Marri	20+	>50	0					
wpt386	50H	359005	6270938	Marri	15-20	>50	0					
wpt387	50H	359008	6270909	Marri	15-20	>50	0					
wpt388	50H	359017	6270898	Marri	15-20	>50	0					
wpt389	50H	359023	6270883	Jarrah	15-20	>50	0					
wpt390	50H	359020	6270885	Marri	15-20	>50	0					
wpt391	50H	359049	6270841	Dead Unknown	15-20	>50	0					
wpt392	50H	359079	6270813	Marri	15-20	>50	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt393	50H	359136	6270739	Marri	15-20	>50	0					
wpt394	50H	359141	6270733	Marri	15-20	>50	0					
wpt395	50H	359161	6270725	Marri	15-20	>50	0					
wpt396	50H	359160	6270725	Marri	15-20	>50	0					
wpt397	50H	359170	6270716	Marri	15-20	>50	0					
wpt398	50H	359159	6270703	Marri	15-20	>50	0					
wpt399	50H	359163	6270703	Marri	15-20	>50	0					
wpt400	50H	359182	6270685	Marri	20+	>50	0					
wpt401	50H	359209	6270661	Marri	20+	>50	0					
wpt402	50H	359223	6270657	Marri	15-20	>50	0					
wpt403	50H	359221	6270651	Marri	20+	>50	0					
wpt404	50H	359237	6270629	Marri	15-20	>50	0					
wpt405	50H	359256	6270608	Dead Marri	15-20	>50	0					
wpt406	50H	359265	6270609	Marri	15-20	>50	0					
wpt407	50H	359268	6270602	Marri	15-20	>50	0					
wpt408	50H	359281	6270596	Marri	20+	>50	0					
wpt409	50H	359280	6270588	Marri	15-20	>50	0					
wpt410	50H	359291	6270580	Marri	15-20	>50	0					
wpt411	50H	359290	6270576	Marri	15-20	>50	0					
wpt412	50H	359301	6270567	Marri	15-20	>50	0					
wpt413	50H	359298	6270562	Jarrah	15-20	>50	0					
wpt414	50H	359313	6270564	Marri	15-20	>50	0					
wpt415	50H	359335	6270541	Marri	15-20	>50	0					
wpt416	50H	359330	6270530	Marri	20+	>50	0					
wpt417	50H	359335	6270529	Dead Unknown	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt418	50H	359361	6270522	Marri	20+	>50	0					
wpt419	50H	359371	6270501	Dead Jarrah	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt420	50H	359376	6270495	Marri	20+	>50	0					
wpt421	50H	359389	6270496	Marri	20+	>50	0					
wpt422	50H	359384	6270493	Marri	20+	>50	0					
wpt423	50H	359402	6270495	Marri	15-20	>50	0					
wpt424	50H	359400	6270484	Marri	20+	>50	0					
wpt425	50H	359420	6270457	Marri	20+	>50	2+	Small	No Signs	No Signs	No	
wpt426	50H	359420	6270451	Marri	15-20	>50	0					
wpt427	50H	359424	6270443	Marri	15-20	>50	0					
wpt428	50H	359813	6269752	Marri	15-20	>50	0					
wpt429	50H	359784	6269795	Marri	20+	>50	0					
wpt430	50H	359782	6269798	Marri	15-20	>50	0					
wpt431	50H	359780	6269823	Marri	15-20	>50	0					
wpt432	50H	359759	6269849	Marri	15-20	>50	0					
wpt433	50H	359729	6269875	Dead Unknown	15-20	>50	2+	Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Possible large chimney
wpt434	50H	359729	6269906	Marri	15-20	>50	0					
wpt435	50H	359705	6269928	Unknown Euc	15-20	>50	0					
wpt436	50H	359702	6269928	Unknown Euc	15-20	>50	0					
wpt437	50H	359702	6269933	Unknown Euc	15-20	>50	0					
wpt438	50H	359657	6270028	Unknown Euc	15-20	>50	0					
wpt439	50H	358304	6270017	Marri	20+	>50	0					
wpt440	50H	358315	6270003	Marri	15-20	>50	0					
wpt441	50H	358318	6269992	Marri	15-20	>50	0					
wpt442	50H	358321	6269963	Marri	15-20	>50	1	Large (Cockatoo)	No Signs	No Signs	Yes	Large chimney

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt443	50H	358309	6269948	Marri	15-20	>50	0					
wpt444	50H	358308	6269897	Marri	15-20	>50	0					
wpt445	50H	358312	6269848	Marri	20+	>50	0					
wpt446	50H	358312	6269841	Marri	20+	>50	0					
wpt447	50H	358320	6269845	Marri	20+	>50	0					
wpt448	50H	358313	6269832	Marri	20+	>50	0					
wpt449	50H	358318	6269822	Marri	20+	>50	0					
wpt450	50H	358324	6269700	Marri	15-20	>50	0					
wpt451	50H	358316	6269689	Marri	15-20	>50	0					
wpt452	50H	358319	6269643	Marri	15-20	>50	0					
wpt453	50H	358326	6269592	Marri	15-20	>50	0					
wpt454	50H	358330	6269478	Marri	15-20	>50	0					
wpt455	50H	358327	6269458	Marri	20+	>50	0					
wpt456	50H	358329	6269458	Marri	15-20	>50	0					
wpt457	50H	358321	6269435	Marri	15-20	>50	0					
wpt458	50H	358324	6269377	Dead Marri	15-20	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt459	50H	358324	6269376	Marri	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt460	50H	358463	6269303	Dead Unknown	15-20	>50	0					
wpt461	50H	358465	6269275	Marri	15-20	>50	0					
wpt462	50H	358281	6269396	Dead Unknown	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt463	50H	358184	6269471	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt464	50H	358156	6269454	Dead Unknown	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt465	50H	357549	6269235	Marri	20+	>50	0					
wpt466	50H	357981	6269864	Dead Unknown	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt467	50H	358025	6269745	Unknown Euc	15-20	>50	0					
wpt468	50H	357993	6269795	Unknown Euc	15-20	>50	0					
wpt469	50H	357941	6269721	Unknown Euc	15-20	>50	0					
wpt470	50H	358623	6270232	Marri	20+	>50	2+	Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt471	50H	358645	6270251	Dead Unknown	5-10	>50	1	Large (Cockatoo)	No Signs	No Signs	Yes	
wpt472	50H	358672	6270330	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt473	50H	358774	6270258	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	Bees	No Signs	Yes	
wpt474	50H	359157	6270446	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt475	50H	358873	6270497	Marri	15-20	>50	0					
wpt476	50H	358853	6270558	Marri	15-20	>50	0					
wpt477	50H	358896	6270590	Marri	20+	>50	0					
wpt478	50H	358866	6270640	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt479	50H	358934	6270821	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	Bees	No Signs	Yes	Examined with drone - one possible but marginal large hollow
wpt480	50H	358638	6270681	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt481	50H	358647	6270750	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt482	50H	358743	6270564	Marri	15-20	>50	2+	Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt483	50H	358719	6270515	Marri	5-10	>50	0					
wpt484	50H	358823	6270429	Marri	20+	>50	2+	Small	No Signs	No Signs	No	
wpt485	50H	358789	6270372	Marri	15-20	>50	0					
wpt486	50H	358584	6271624	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Examined with drone - one possible large side entry hollow
wpt487	50H	358547	6271628	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Examined with drone - one possible large side entry hollow
wpt488	50H	358733	6271119	Marri	20+	>50	2+	Small	No Signs	No Signs	No	
wpt489	50H	358732	6271101	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt490	50H	359305	6270460	Marri	15-20	>50	0					
wpt491	50H	359311	6270606	Dead Unknown	20+	>50	2+	Small & Medium	No Signs	No Signs	No	Examined with drone - no suitable hollows
wpt492	50H	355707	6271576	Unknown Euc	15-20	>50	0					



Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt493	50H	355671	6271542	Unknown Euc	15-20	>50	0					
wpt494	50H	355656	6271524	Unknown Euc	15-20	>50	0					
wpt495	50H	356111	6270935	Unknown Euc	15-20	>50	0					
wpt496	50H	356118	6270925	Unknown Euc	15-20	>50	0					
wpt497	50H	356136	6270907	Unknown Euc	15-20	>50	0					
wpt498	50H	356620	6269951	Flooded Gum	15-20	>50	0					
wpt499	50H	356611	6269815	Flooded Gum	15-20	>50	0					
wpt500	50H	356610	6269765	Flooded Gum	15-20	>50	0					
wpt501	50H	356694	6269953	Flooded Gum	15-20	>50	0					
wpt502	50H	358033	6270144	Tuart	20+	>50	0					
wpt503	50H	358590	6270703	Marri	15-20	>50	0					
wpt504	50H	358595	6270719	Marri	15-20	>50	0					
wpt505	50H	358582	6270754	Dead Jarrah	15-20	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt506	50H	358587	6270787	Marri	15-20	>50	0					
wpt507	50H	358597	6270797	Marri	15-20	>50	0					
wpt508	50H	358589	6270813	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt509	50H	358602	6270842	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	Lot 1462
wpt510	50H	358608	6270853	Dead Marri	20+	>50	0					Lot 1462
wpt511	50H	358595	6270839	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt512	50H	358571	6270836	Dead Unknown	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt513	50H	358549	6270830	Jarrah	15-20	>50	0					
wpt514	50H	358524	6270816	Marri	15-20	>50	1	Small	No Signs	No Signs	No	
wpt515	50H	358517	6270828	Jarrah	15-20	>50	0					
wpt516	50H	358499	6270825	Jarrah	15-20	>50	0					
wpt517	50H	358475	6270830	Jarrah	15-20	>50	1	Large (Cockatoo)	No Signs	No Signs	Yes	
wpt518	50H	358472	6270856	Marri	20+	>50	1	Large (Cockatoo)	No Signs	No Signs	Yes	
wpt519	50H	358427	6270843	Marri	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt520	50H	358404	6270837	Marri	15-20	>50	0					
wpt521	50H	358409	6270821	Marri	15-20	>50	0					
wpt522	50H	358429	6270817	Dead Jarrah	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt523	50H	358412	6270782	Marri	15-20	>50	0					
wpt524	50H	358417	6270769	Marri	15-20	>50	0					
wpt525	50H	358416	6270752	Marri	15-20	>50	0					
wpt526	50H	358416	6270744	Marri	20+	>50	0					
wpt527	50H	358416	6270739	Marri	15-20	>50	0					
wpt528	50H	358415	6270736	Marri	15-20	>50	0					
wpt529	50H	358417	6270732	Marri	15-20	>50	0					
wpt530	50H	358414	6270717	Marri	15-20	>50	0					
wpt531	50H	358418	6270706	Marri	15-20	>50	0					
wpt532	50H	358419	6270692	Marri	20+	>50	0					
wpt533	50H	358440	6270697	Marri	20+	>50	0					
wpt534	50H	358446	6270694	Marri	15-20	>50	0					
wpt535	50H	358469	6270714	Marri	20+	>50	0					
wpt536	50H	358479	6270702	Marri	15-20	>50	0					
wpt537	50H	358487	6270711	Jarrah	15-20	>50	0					
wpt538	50H	358496	6270717	Marri	20+	>50	2+	Large (Cockatoo)	No Signs	No Signs	Yes	
wpt539	50H	358538	6270726	Marri	15-20	>50	0					
wpt540	50H	358551	6270722	Jarrah	15-20	>50	0					
wpt541	50H	358556	6270743	Dead Marri	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt542	50H	358564	6270776	Marri	15-20	>50	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt543	50H	358574	6270788	Marri	15-20	>50	0					
wpt544	50H	358571	6270802	Marri	15-20	>50	0					
wpt545	50H	358521	6270792	Jarrah	15-20	>50	0					
wpt546	50H	358494	6270786	Marri	15-20	>50	0					
wpt547	50H	358467	6270783	Marri	20+	>50	0					
wpt548	50H	358465	6270786	Marri	15-20	>50	0					
wpt549	50H	358464	6270771	Marri	15-20	>50	2+	Small & Medium	Bees	No Signs	No	
wpt550	50H	358450	6270770	Marri	15-20	>50	1	Large (Cockatoo)	No Signs	No Signs	Yes	
wpt551	50H	358455	6270762	Dead Jarrah	5-10	>50	1	Large (Cockatoo)	No Signs	No Signs	Yes	
wpt552	50H	358459	6270739	Jarrah	15-20	>50	0					
wpt553	50H	358463	6270737	Jarrah	15-20	>50	0					
wpt554	50H	358472	6270737	Marri	15-20	>50	0					
wpt555	50H	358487	6270727	Marri	15-20	>50	0					
wpt556	50H	358538	6270770	Marri	15-20	>50	0					
wpt557	50H	358527	6270778	Marri	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt558	50H	358513	6270776	Marri	15-20	>50	0					
wpt559	50H	358476	6270761	Jarrah	15-20	>50	0					
wpt560	50H	358355	6270784	Dead Unknown	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt561	50H	358328	6270238	Tuart	20+	>50	0					
wpt562	50H	358323	6270238	Tuart	20+	>50	0					
wpt563	50H	358315	6270237	Tuart	20+	>50	0					
wpt564	50H	358307	6270238	Tuart	20+	>50	0					
wpt565	50H	358301	6270237	Unknown Euc	20+	>50	0					
wpt566	50H	358299	6270234	Tuart	20+	>50	0					
wpt567	50H	358295	6270235	Tuart	20+	>50	0					
wpt568	50H	358290	6270237	Tuart	20+	>50	0					
wpt569	50H	358285	6270240	Unknown Euc	15-20	>50	0					
wpt570	50H	358282	6270241	Unknown Euc	15-20	>50	0					
wpt571	50H	358275	6270241	Unknown Euc	15-20	>50	0					
wpt572	50H	358272	6270246	Unknown Euc	15-20	>50	0					
wpt573	50H	358262	6270238	Tuart	20+	>50	0					
wpt574	50H	358258	6270234	Unknown Euc	15-20	>50	0					
wpt575	50H	358256	6270236	Tuart	20+	>50	0					
wpt576	50H	358247	6270236	Unknown Euc	15-20	>50	0					
wpt577	50H	358241	6270234	Unknown Euc	15-20	>50	0					
wpt578	50H	358237	6270233	Tuart	20+	>50	0					
wpt579	50H	358234	6270235	Unknown Euc	15-20	>50	0					
wpt580	50H	358232	6270235	Tuart	20+	>50	0					
wpt581	50H	358149	6270234	Tuart	20+	>50	0					
wpt582	50H	358140	6270229	Unknown Euc	15-20	>50	0					
wpt583	50H	358133	6270230	Unknown Euc	15-20	>50	0					
wpt584	50H	358128	6270233	Unknown Euc	15-20	>50	0					
wpt585	50H	358014	6270190	Wandoo	15-20	>50	0					
wpt586	50H	358016	6270121	Unknown Euc	15-20	>50	0					
wpt587	50H	358069	6270092	Wandoo	15-20	>50	0					
wpt588	50H	358052	6270064	Unknown Euc	15-20	>50	0					
wpt589	50H	356824	6269769	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt590	50H	356787	6269775	Flooded Gum	10-15	>50	0					
wpt591	50H	356768	6269774	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt592	50H	356651	6269812	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt593	50H	356672	6269770	Flooded Gum	15-20	>50	0					
wpt594	50H	356673	6269754	Flooded Gum	10-15	>50	0					
wpt595	50H	356715	6269733	Flooded Gum	15-20	>50	0					
wpt596	50H	356802	6269663	Flooded Gum	10-15	>50	0					
wpt597	50H	356804	6269655	Flooded Gum	10-15	>50	0					
wpt598	50H	356807	6269652	Flooded Gum	10-15	>50	0					
wpt599	50H	356807	6269641	Flooded Gum	10-15	>50	0					
wpt600	50H	356781	6269603	Flooded Gum	15-20	>50	0					
wpt601	50H	356815	6269617	Flooded Gum	15-20	>50	0					
wpt602	50H	356849	6269639	Flooded Gum	15-20	>50	0					
wpt603	50H	356876	6269602	Flooded Gum	15-20	>50	0					
wpt604	50H	356888	6269540	Flooded Gum	15-20	>50	0					
wpt605	50H	356910	6269523	Flooded Gum	15-20	>50	2+	Small & Medium	28 Parrot	No Signs	No	
wpt606	50H	356926	6269481	Flooded Gum	10-15	>50	0					
wpt607	50H	356790	6269559	Flooded Gum	10-15	>50	0					
wpt608	50H	356764	6269585	Flooded Gum	10-15	>50	0					
wpt609	50H	356793	6269456	Flooded Gum	10-15	>50	0					
wpt610	50H	356970	6269424	Flooded Gum	10-15	>50	0					
wpt611	50H	357046	6269428	Flooded Gum	15-20	>50	0					
wpt612	50H	357048	6269436	Flooded Gum	15-20	>50	0					
wpt613	50H	356951	6269585	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt614	50H	356997	6269589	Flooded Gum	10-15	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt615	50H	357023	6269623	Marri	15-20	>50	0					
wpt616	50H	357080	6269650	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt617	50H	357419	6269488	Marri	15-20	>50	0					
wpt618	50H	357383	6269483	Marri	15-20	>50	0					
wpt619	50H	357260	6269668	Marri	15-20	>50	0					
wpt620	50H	357258	6269673	Marri	15-20	>50	0					
wpt621	50H	357257	6269687	Marri	15-20	>50	0					
wpt622	50H	357302	6269695	Marri	15-20	>50	0					
wpt623	50H	356910	6270160	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt624	50H	356900	6270159	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt625	50H	356889	6270160	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt626	50H	356897	6270179	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt627	50H	356882	6270197	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt628	50H	356897	6270221	Flooded Gum	10-15	>50	0					
wpt629	50H	356887	6270231	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt630	50H	356866	6270225	Flooded Gum	10-15	>50	0					
wpt631	50H	356861	6270229	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt632	50H	356864	6270243	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt633	50H	356868	6270249	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt634	50H	356869	6270254	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt635	50H	356879	6270262	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt636	50H	356877	6270274	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt637	50H	356867	6270275	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt638	50H	356849	6270316	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt639	50H	356841	6270328	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt640	50H	356839	6270325	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt641	50H	356850	6270359	Flooded Gum	10-15	>50	0					
wpt642	50H	356827	6270342	Flooded Gum	10-15	>50	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt643	50H	356829	6270352	Flooded Gum	10-15	>50	0					
wpt644	50H	356829	6270355	Flooded Gum	10-15	>50	0					
wpt645	50H	356882	6270388	Flooded Gum	20+	>50	0					
wpt646	50H	356836	6270379	Dead Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt647	50H	356838	6270412	Flooded Gum	10-15	>50	0					
wpt648	50H	356825	6270387	Flooded Gum	10-15	>50	0					
wpt649	50H	356825	6270236	Marri	15-20	>50	0					
wpt650	50H	356824	6270222	Marri	15-20	>50	0					
wpt651	50H	356831	6270211	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt652	50H	356823	6270075	Marri	15-20	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt653	50H	356513	6271675	Flooded Gum	15-20	>50	0					
wpt654	50H	356519	6271674	Flooded Gum	15-20	>50	0					
wpt655	50H	356535	6271649	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt656	50H	356542	6271656	Flooded Gum	15-20	>50	0					
wpt657	50H	356529	6271617	Marri	15-20	>50	0					
wpt658	50H	356531	6271617	Marri	15-20	>50	0					
wpt659	50H	356537	6271613	Marri	15-20	>50	0					
wpt660	50H	356537	6271625	Flooded Gum	10-15	>50	0					
wpt661	50H	356533	6271622	Flooded Gum	10-15	>50	0					
wpt662	50H	356554	6271599	Flooded Gum	15-20	>50	0					
wpt663	50H	356552	6271593	Flooded Gum	15-20	>50	0					
wpt664	50H	356577	6271566	Flooded Gum	15-20	>50	0					
wpt665	50H	356577	6271568	Flooded Gum	15-20	>50	0					
wpt666	50H	356528	6271522	Dead Unknown	0-5	>50	1	Large (Cockatoo)	No Signs	No Signs	Yes	
wpt667	50H	356513	6271519	Flooded Gum	15-20	>50	0					
wpt668	50H	356510	6271520	Flooded Gum	15-20	>50	0					
wpt669	50H	356503	6271509	Flooded Gum	15-20	>50	0					
wpt670	50H	356506	6271483	Flooded Gum	15-20	>50	0					
wpt671	50H	356504	6271480	Flooded Gum	15-20	>50	0					
wpt672	50H	356501	6271464	Flooded Gum	15-20	>50	0					
wpt673	50H	356575	6271421	Marri	15-20	>50	0					
wpt674	50H	356581	6271401	Marri	15-20	>50	0					
wpt675	50H	356571	6271388	Marri	15-20	>50	0					
wpt676	50H	356503	6271367	Flooded Gum	15-20	>50	0					
wpt677	50H	356494	6271357	Flooded Gum	15-20	>50	0					
wpt678	50H	356477	6271337	Flooded Gum	15-20	>50	0					
wpt679	50H	356475	6271336	Flooded Gum	15-20	>50	0					
wpt680	50H	356473	6271332	Flooded Gum	15-20	>50	0					
wpt681	50H	356460	6271315	Marri	15-20	>50	0					
wpt682	50H	356462	6271309	Flooded Gum	15-20	>50	0					
wpt683	50H	356462	6271307	Flooded Gum	15-20	>50	0					
wpt684	50H	356466	6271300	Flooded Gum	15-20	>50	0					
wpt685	50H	356449	6271269	Flooded Gum	20+	>50	0					
wpt686	50H	356444	6271244	Marri	15-20	>50	0					
wpt687	50H	356414	6271180	Marri	20+	>50	0					
wpt688	50H	356472	6271204	Marri	15-20	>50	0					
wpt689	50H	356472	6271203	Marri	20+	>50	0					
wpt690	50H	356486	6271162	Marri	15-20	>50	0					
wpt691	50H	356503	6271150	Marri	15-20	>50	0					
wpt692	50H	356513	6271155	Flooded Gum	15-20	>50	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt693	50H	356530	6271157	Flooded Gum	15-20	>50	0					
wpt694	50H	356534	6271149	Marri	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt695	50H	356517	6271130	Marri	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt696	50H	356538	6271081	Dead Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt697	50H	356481	6271079	Flooded Gum	15-20	>50	0					
wpt698	50H	356473	6271074	Flooded Gum	15-20	>50	0					
wpt699	50H	356461	6271081	Flooded Gum	15-20	>50	0					
wpt700	50H	356449	6271116	Flooded Gum	15-20	>50	0					
wpt701	50H	356414	6271064	Flooded Gum	15-20	>50	0					
wpt702	50H	356411	6271044	Flooded Gum	15-20	>50	0					
wpt703	50H	356397	6271045	Flooded Gum	15-20	>50	0					
wpt704	50H	356478	6271052	Flooded Gum	20+	>50	0					
wpt705	50H	356473	6271037	Marri	20+	>50	0					
wpt706	50H	356458	6271032	Flooded Gum	15-20	>50	0					
wpt707	50H	356411	6271006	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt708	50H	356431	6271006	Marri	15-20	>50	0					
wpt709	50H	356432	6271001	Marri	20+	>50	0					
wpt710	50H	356440	6270987	Marri	20+	>50	0					
wpt711	50H	356398	6270945	Flooded Gum	15-20	>50	0					
wpt712	50H	356348	6270937	Flooded Gum	15-20	>50	0					
wpt713	50H	356471	6270974	Flooded Gum	20+	>50	0					
wpt714	50H	356461	6270931	Marri	20+	>50	0					
wpt715	50H	356473	6270893	Flooded Gum	15-20	>50	0					
wpt716	50H	356493	6270900	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt717	50H	356499	6270895	Marri	15-20	>50	0					
wpt718	50H	356506	6270883	Flooded Gum	15-20	>50	0					
wpt719	50H	356540	6270896	Flooded Gum	15-20	>50	0					
wpt720	50H	356507	6270930	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	Bees	No Signs	Yes	
wpt721	50H	356536	6271066	Marri	15-20	>50	0					
wpt722	50H	356558	6271077	Flooded Gum	15-20	>50	0					
wpt723	50H	356564	6271068	Flooded Gum	15-20	>50	0					
wpt724	50H	356570	6271065	Flooded Gum	15-20	>50	0					
wpt725	50H	356572	6271069	Flooded Gum	15-20	>50	0					
wpt726	50H	356571	6271074	Flooded Gum	15-20	>50	0					
wpt727	50H	356577	6271097	Marri	15-20	>50	0					
wpt728	50H	356562	6271102	Marri	15-20	>50	0					
wpt729	50H	356547	6271142	Flooded Gum	15-20	>50	0					
wpt730	50H	356546	6271157	Flooded Gum	15-20	>50	0					
wpt731	50H	356543	6271165	Flooded Gum	15-20	>50	0					
wpt732	50H	356543	6271182	Flooded Gum	10-15	>50	2+	Small	No Signs	No Signs	No	
wpt733	50H	356514	6271206	Flooded Gum	15-20	>50	0					
wpt734	50H	356510	6271207	Flooded Gum	15-20	>50	0					
wpt735	50H	356491	6271207	Flooded Gum	15-20	>50	0					
wpt736	50H	356494	6271227	Flooded Gum	15-20	>50	0					
wpt737	50H	356494	6271227	Marri	15-20	>50	0					
wpt738	50H	356497	6271237	Flooded Gum	15-20	>50	0					
wpt739	50H	356490	6271246	Flooded Gum	15-20	>50	0					
wpt740	50H	356478	6271244	Flooded Gum	15-20	>50	0					
wpt741	50H	356475	6271261	Marri	15-20	>50	0					
wpt742	50H	356474	6271273	Flooded Gum	15-20	>50	1	Large (Cockatoo)	No Signs	No Signs	Yes	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt743	50H	356482	6271293	Flooded Gum	15-20	>50	0					
wpt744	50H	356520	6271281	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt745	50H	356524	6271283	Marri	20+	>50	0					
wpt746	50H	356540	6271287	Marri	20+	>50	0					
wpt747	50H	356586	6271324	Flooded Gum	5-10	>50	0					
wpt748	50H	356524	6271376	Marri	15-20	>50	0					
wpt749	50H	356534	6271371	Flooded Gum	15-20	>50	0					
wpt750	50H	356539	6271367	Dead Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt751	50H	356549	6271357	Flooded Gum	15-20	>50	0					
wpt752	50H	356554	6271356	Marri	15-20	>50	0					
wpt753	50H	356557	6271359	Marri	15-20	>50	0					
wpt754	50H	356571	6271374	Flooded Gum	15-20	>50	0					
wpt755	50H	356592	6271409	Flooded Gum	20+	>50	0					
wpt756	50H	356588	6271407	Flooded Gum	20+	>50	0					
wpt757	50H	356604	6271433	Flooded Gum	15-20	>50	0					
wpt758	50H	356601	6271455	Flooded Gum	15-20	>50	0					
wpt759	50H	356595	6271458	Marri	20+	>50	0					
wpt760	50H	356587	6271463	Flooded Gum	15-20	>50	0					
wpt761	50H	356586	6271472	Flooded Gum	15-20	>50	0					
wpt762	50H	356599	6271484	Marri	15-20	>50	0					
wpt763	50H	356589	6271485	Flooded Gum	15-20	>50	0					
wpt764	50H	356552	6271465	Flooded Gum	15-20	>50	0					
wpt765	50H	356523	6271492	Dead Flooded Gum	15-20	>50	0					
wpt766	50H	356558	6271516	Marri	20+	>50	0					
wpt767	50H	356562	6271520	Flooded Gum	15-20	>50	0					
wpt768	50H	356567	6271537	Marri	15-20	>50	0					
wpt769	50H	356568	6271546	Flooded Gum	15-20	>50	0					
wpt770	50H	356573	6271549	Marri	15-20	>50	0					
wpt771	50H	356575	6271556	Marri	15-20	>50	1	Large (Cockatoo)	No Signs	No Signs	Yes	
wpt772	50H	356590	6271584	Flooded Gum	15-20	>50	0					
wpt773	50H	356584	6271624	Flooded Gum	15-20	>50	0					
wpt774	50H	356579	6271630	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt775	50H	356589	6271648	Flooded Gum	15-20	>50	0					
wpt776	50H	356578	6271657	Flooded Gum	15-20	>50	0					
wpt777	50H	356559	6271663	Flooded Gum	15-20	>50	0					
wpt778	50H	356602	6271661	Flooded Gum	15-20	>50	0					
wpt779	50H	356616	6271665	Flooded Gum	15-20	>50	0					
wpt780	50H	356673	6271628	Flooded Gum	20+	>50	2+	Small	No Signs	No Signs	No	
wpt781	50H	356663	6271636	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt782	50H	356688	6271617	Flooded Gum	20+	>50	0					
wpt783	50H	356698	6271624	Flooded Gum	20+	>50	0					
wpt784	50H	356697	6271638	Flooded Gum	20+	>50	1	Small	Bees	No Signs	No	
wpt785	50H	356691	6271576	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt786	50H	356693	6271544	Flooded Gum	15-20	>50	0					
wpt787	50H	356686	6271523	Flooded Gum	15-20	>50	0					
wpt788	50H	356651	6271530	Marri	15-20	>50	0					
wpt789	50H	356649	6271529	Flooded Gum	15-20	>50	0					
wpt790	50H	356644	6271527	Flooded Gum	15-20	>50	0					
wpt791	50H	356595	6271538	Dead Flooded Gum	15-20	>50	0					
wpt792	50H	356661	6271355	Flooded Gum	15-20	>50	0					



Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt793	50H	356674	6271366	Flooded Gum	15-20	>50	0					
wpt794	50H	356736	6271475	Flooded Gum	10-15	>50	0					
wpt795	50H	356764	6271394	Flooded Gum	15-20	>50	0					
wpt796	50H	356781	6271398	Flooded Gum	15-20	>50	0					
wpt797	50H	356801	6271358	Dead Unknown	15-20	>50	0					
wpt798	50H	356797	6271409	Flooded Gum	15-20	>50	0					
wpt799	50H	356805	6271406	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt800	50H	356824	6271518	Flooded Gum	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt801	50H	356777	6271551	Flooded Gum	15-20	>50	0					
wpt802	50H	356774	6271586	Dead Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt803	50H	356820	6271611	Flooded Gum	20+	>50	2+	Small & Medium	Bees	No Signs	No	
wpt804	50H	356813	6271656	Flooded Gum	15-20	>50	0					
wpt805	50H	356802	6271668	Flooded Gum	15-20	>50	1	Large	No Signs	No Signs	No	Too low
wpt806	50H	356769	6271654	Flooded Gum	20+	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt807	50H	356955	6271671	Flooded Gum	15-20	>50	0					
wpt808	50H	356918	6271666	Flooded Gum	10-15	>50	0					
wpt809	50H	356889	6271633	Flooded Gum	10-15	>50	0					
wpt810	50H	356881	6271642	Flooded Gum	15-20	>50	0					
wpt811	50H	356841	6271671	Flooded Gum	15-20	>50	0					
wpt812	50H	356854	6271626	Flooded Gum	10-15	>50	0					
wpt813	50H	356853	6271598	Flooded Gum	15-20	>50	0					
wpt814	50H	356838	6271573	Flooded Gum	20+	>50	2+	Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Large spout
wpt815	50H	356859	6271558	Flooded Gum	15-20	>50	0					
wpt816	50H	356888	6271513	Flooded Gum	10-15	>50	2+	Medium & Large (Cockatoo)	Bees	No Signs	Yes	
wpt817	50H	356855	6271436	Flooded Gum	10-15	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt818	50H	356849	6271426	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt819	50H	356854	6271409	Flooded Gum	15-20	>50	0					
wpt820	50H	356844	6271394	Flooded Gum	15-20	>50	0					
wpt821	50H	356872	6271343	Flooded Gum	15-20	>50	0					
wpt822	50H	356883	6271332	Flooded Gum	15-20	>50	0					
wpt823	50H	356861	6271134	Flooded Gum	10-15	>50	0					
wpt824	50H	356851	6271116	Flooded Gum	15-20	>50	0					
wpt825	50H	356832	6271075	Flooded Gum	10-15	>50	0					
wpt826	50H	356807	6271097	Flooded Gum	10-15	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt827	50H	356854	6271042	Flooded Gum	10-15	>50	0					
wpt828	50H	356880	6270958	Flooded Gum	15-20	>50	0					
wpt829	50H	356883	6270940	Flooded Gum	15-20	>50	0					
wpt830	50H	356884	6270938	Flooded Gum	15-20	>50	0					
wpt831	50H	356881	6270932	Flooded Gum	15-20	>50	0					
wpt832	50H	356878	6270849	Dead Unknown	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt833	50H	356838	6270842	Dead Marri	15-20	>50	1	Large	No Signs	No Signs	No	Too low
wpt834	50H	356821	6270819	Dead Unknown	10-15	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt835	50H	356806	6270797	Flooded Gum	10-15	>50	0					
wpt836	50H	356835	6270799	Flooded Gum	15-20	>50	0					
wpt837	50H	356859	6270812	Flooded Gum	15-20	>50	0					
wpt838	50H	356860	6270810	Flooded Gum	10-15	>50	0					
wpt839	50H	356859	6270803	Flooded Gum	10-15	>50	0					
wpt840	50H	356824	6270722	Flooded Gum	10-15	>50	0					
wpt841	50H	356848	6270688	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt842	50H	356859	6270703	Flooded Gum	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt843	50H	356906	6270766	Flooded Gum	15-20	>50	0					
wpt844	50H	356919	6270800	Flooded Gum	10-15	>50	0					
wpt845	50H	356953	6270883	Dead Unknown	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt846	50H	356989	6270850	Flooded Gum	10-15	>50	0					
wpt847	50H	356979	6270957	Flooded Gum	10-15	>50	0					
wpt848	50H	357221	6270964	Marri	15-20	>50	0					
wpt849	50H	357107	6271358	Flooded Gum	10-15	>50	0					
wpt850	50H	357088	6271357	Flooded Gum	10-15	>50	0					
wpt851	50H	357100	6271422	Unknown Euc	15-20	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	
wpt852	50H	357103	6271449	Flooded Gum	15-20	>50	0					
wpt853	50H	357091	6271468	Flooded Gum	15-20	>50	0					
wpt854	50H	357035	6271471	Flooded Gum	15-20	>50	0					
wpt855	50H	357025	6271506	Flooded Gum	10-15	>50	0					
wpt856	50H	356989	6271443	Flooded Gum	15-20	>50	0					
wpt857	50H	356976	6271458	Flooded Gum	10-15	>50	0					
wpt858	50H	356961	6271484	Flooded Gum	10-15	>50	0					
wpt859	50H	356950	6271487	Flooded Gum	10-15	>50	0					
wpt860	50H	356956	6271503	Flooded Gum	10-15	>50	0					
wpt861	50H	356951	6271520	Flooded Gum	15-20	>50	0					
wpt862	50H	356933	6271552	Flooded Gum	15-20	>50	0					
wpt863	50H	356944	6271556	Flooded Gum	15-20	>50	0					
wpt864	50H	356976	6271585	Flooded Gum	15-20	>50	0					
wpt865	50H	356988	6271590	Flooded Gum	15-20	>50	0					
wpt866	50H	357009	6271594	Flooded Gum	15-20	>50	0					
wpt867	50H	356969	6271634	Flooded Gum	10-15	>50	0					
wpt868	50H	357323	6271574	Flooded Gum	15-20	>50	0					
wpt869	50H	357492	6271632	Dead Unknown	5-10	>50	1	Large	No Signs	No Signs	No	Too shallow
wpt870	50H	358316	6271474	Dead Marri	20+	>50	2+	Medium & Large	No signs	No signs	No	Examined with drone - too shallow
wpt871	50H	358285	6271479	Dead Marri	20+	>50	2+	Small & Medium	Bees	No Signs	No	28s nesting?
wpt872	50H	358134	6271389	Dead Unknown	0-5	>50	0					
wpt873	50H	358128	6271386	Dead Unknown	10-15	>50	0					
wpt874	50H	357927	6271249	Dead Unknown	15-20	>50	2+	Small, Medium & Large	No Signs	No Signs	No	Examined with drone - no suitable hollows
wpt875	50H	358254	6271334	Dead Unknown	15-20	>50	2+	Small, Medium & Large (Cockatoo)	Bees	No Signs	Yes	Examined with drone - one possible large side entry hollow
wpt876	50H	358287	6271339	Dead Unknown	0-5	>50	1	Large	No Signs	No Signs	No	Examined with drone - hollow unsuitable
wpt877	50H	358254	6271294	Dead Unknown	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Examined with drone - one possible large side entry hollow
wpt878	50H	358396	6271268	Dead Unknown	20+	>50	2+	Small & Medium	28 Parrot	No Signs	No	
wpt879	50H	358281	6271183	Marri	15-20	>50	0					
wpt880	50H	358288	6270963	Marri	15-20	>50	0					
wpt881	50H	358292	6270957	Marri	15-20	>50	0					
wpt882	50H	358291	6270956	Marri	15-20	>50	0					
wpt883	50H	358284	6270946	Marri	15-20	>50	0					
wpt884	50H	358278	6270950	Marri	15-20	>50	1	Medium	No Signs	No Signs	No	
wpt885	50H	358254	6270953	Marri	15-20	>50	0					
wpt886	50H	358502	6270913	Marri	15-20	>50	1	Large	No Signs	No Signs	No	Examined with drone - hollow too shallow
wpt888	50H	358625	6270875	Marri	20+	>50	2+	Small	No Signs	No Signs	No	
wpt889	50H	358670	6270944	Dead Unknown	10-15	>50	1	Medium	No Signs	No Signs	No	Examined with drone - hollow unsuitable
wpt890	50H	358736	6270886	Dead Unknown	10-15	>50	0					
wpt891	50H	358952	6270936	Flooded Gum	15-20	>50	0					
wpt892	50H	359018	6270873	Marri	15-20	>50	0					
wpt893	50H	358981	6270874	Marri	15-20	>50	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt894	50H	358957	6270874	Marri	15-20	>50	0					
wpt895	50H	359232	6270900	Dead Marri	15-20	>50	0					
wpt896	50H	359218	6270920	Marri	20+	>50	0					
wpt897	50H	359245	6270941	Marri	20+	>50	0					
wpt898	50H	359283	6270998	Marri	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt899	50H	359290	6271290	Marri	20+	>50	1	Medium	No Signs	No Signs	No	
wpt900	50H	359261	6271259	Jarrah	15-20	>50	1	Large	No Signs	No Signs	No	Too low
wpt901	50H	359189	6271303	Jarrah	15-20	>50	2+	Small, Medium & Large	No Signs	No Signs	No	Examined with drone - no suitable hollows
wpt902	50H	359168	6271232	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt903	50H	359100	6271243	Marri	15-20	>50	2+	Small & Medium	Bees	No Signs	No	
wpt904	50H	359072	6271037	Flooded Gum	15-20	>50	0					
wpt905	50H	359085	6271019	Flooded Gum	15-20	>50	0					
wpt906	50H	359004	6270980	Marri	20+	>50	0					
wpt907	50H	359006	6270984	Marri	5-10	>50	0					
wpt908	50H	358977	6271058	Flooded Gum	10-15	>50	0					
wpt909	50H	358978	6271065	Flooded Gum	10-15	>50	0					
wpt910	50H	358958	6271055	Flooded Gum	10-15	>50	0					
wpt911	50H	358935	6271068	Flooded Gum	10-15	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt912	50H	358944	6271088	Flooded Gum	10-15	>50	0					
wpt913	50H	358942	6271115	Flooded Gum	10-15	>50	0					
wpt914	50H	358917	6271124	Flooded Gum	10-15	>50	0					
wpt915	50H	358904	6271216	Marri	20+	>50	0					
wpt916	50H	358912	6271236	Marri	15-20	>50	0					
wpt917	50H	358896	6271245	Marri	15-20	>50	0					
wpt918	50H	358881	6271240	Marri	15-20	>50	0					
wpt919	50H	358878	6271245	Marri	15-20	>50	0					
wpt920	50H	358868	6271262	Marri	15-20	>50	1	Medium	Bees	No Signs	No	
wpt921	50H	358845	6271216	Marri	20+	>50	1	Medium	28 Parrot	No Signs	No	
wpt922	50H	358813	6271145	Marri	10-15	>50	0					
wpt923	50H	358805	6271137	Marri	20+	>50	1	Medium	Bees	No Signs	No	
wpt924	50H	358781	6271164	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt925	50H	360293	6271568	Unkown Euc	10-15	>50	0					
wpt926	50H	360291	6271571	Unkown Euc	10-15	>50	0					
wpt927	50H	360298	6271615	Marri	15-20	>50	0					
wpt928	50H	360300	6271626	Marri	15-20	>50	0					
wpt929	50H	360308	6271690	Marri	15-20	>50	0					
wpt930	50H	360295	6271684	Marri	15-20	>50	0					
wpt931	50H	359642	6270688	Marri	15-20	>50	0					
wpt932	50H	359430	6270720	Marri	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	
wpt933	50H	359460	6270630	Dead Unknown	15-20	>50	2+	Medium & Large	No Signs	No Signs	No	Examined with drone - no suitable hollows
wpt934	50H	358506	6269745	Unknown Euc	15-20	>50	0					
wpt935	50H	358513	6269745	Unknown Euc	15-20	>50	0					
wpt936	50H	358517	6269747	Unknown Euc	15-20	>50	0					
wpt937	50H	358522	6269747	Unknown Euc	15-20	>50	0					
wpt938	50H	358528	6269748	Unknown Euc	15-20	>50	0					
wpt939	50H	358465	6269744	Unknown Euc	15-20	>50	0					
wpt940	50H	358375	6269742	Unknown Euc	15-20	>50	0					
wpt941	50H	358452	6269744	Unknown Euc	15-20	>50	0					
wpt942	50H	358483	6269744	Unknown Euc	15-20	>50	0					
wpt943	50H	358475	6269745	Unknown Euc	15-20	>50	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt944	50H	357815	6269231	Marri	20+	>50	0					
wpt945	50H	358998	6270027	Unknown Euc	15-20	>50	0					
wpt946	50H	358998	6270020	Unknown Euc	15-20	>50	0					
wpt947	50H	358998	6270012	Unknown Euc	15-20	>50	0					
wpt948	50H	358998	6270005	Unknown Euc	15-20	>50	0					
wpt949	50H	358998	6269996	Unknown Euc	15-20	>50	0					
wpt950	50H	358997	6269987	Unknown Euc	15-20	>50	0					
wpt951	50H	358998	6269979	Unknown Euc	15-20	>50	0					
wpt952	50H	358998	6269973	Unknown Euc	15-20	>50	0					
wpt953	50H	358999	6269967	Unknown Euc	15-20	>50	0					
wpt954	50H	358999	6269959	Unknown Euc	15-20	>50	0					
wpt955	50H	359000	6269953	Unknown Euc	15-20	>50	0					
wpt956	50H	358999	6269944	Unknown Euc	15-20	>50	0					
wpt957	50H	359000	6269936	Unknown Euc	15-20	>50	0					
wpt958	50H	359000	6269925	Unknown Euc	15-20	>50	0					
wpt959	50H	358997	6269916	Unknown Euc	15-20	>50	0					
wpt960	50H	359000	6269909	Unknown Euc	15-20	>50	0					
wpt961	50H	359000	6269903	Unknown Euc	15-20	>50	0					
wpt962	50H	359000	6269896	Unknown Euc	15-20	>50	0					
wpt963	50H	359000	6269888	Unknown Euc	15-20	>50	0					
wpt964	50H	358999	6269879	Unknown Euc	15-20	>50	0					
wpt965	50H	359000	6269934	Unknown Euc	15-20	>50	0					
wpt966	50H	358619	6270216	Unknown Euc	15-20	>50	0					
wpt967	50H	358620	6270211	Unknown Euc	15-20	>50	0					
wpt968	50H	358619	6270205	Unknown Euc	15-20	>50	0					
wpt969	50H	358619	6270199	Unknown Euc	15-20	>50	0					
wpt970	50H	358620	6270195	Unknown Euc	15-20	>50	0					
wpt971	50H	358620	6270189	Unknown Euc	15-20	>50	0					
wpt972	50H	358620	6270183	Unknown Euc	15-20	>50	0					
wpt973	50H	358621	6270176	Unknown Euc	15-20	>50	0					
wpt974	50H	358621	6270171	Unknown Euc	15-20	>50	0					
wpt975	50H	358622	6270165	Unknown Euc	15-20	>50	0					
wpt976	50H	358622	6270160	Unknown Euc	15-20	>50	0					
wpt977	50H	358621	6270153	Unknown Euc	15-20	>50	0					
wpt978	50H	358622	6270148	Unknown Euc	15-20	>50	0					
wpt979	50H	358622	6270141	Unknown Euc	15-20	>50	0					
wpt980	50H	358622	6270136	Unknown Euc	15-20	>50	0					
wpt981	50H	358622	6270131	Unknown Euc	15-20	>50	0					
wpt982	50H	358622	6270125	Unknown Euc	15-20	>50	0					
wpt983	50H	358622	6270118	Unknown Euc	15-20	>50	0					
wpt984	50H	358622	6270111	Unknown Euc	15-20	>50	0					
wpt985	50H	358529	6270245	Unknown Euc	15-20	>50	0					
wpt986	50H	358554	6270244	Unknown Euc	15-20	>50	0					
wpt987	50H	358566	6270244	Unknown Euc	15-20	>50	0					
wpt988	50H	358583	6270245	Unknown Euc	15-20	>50	0					
wpt989	50H	358596	6270245	Unknown Euc	15-20	>50	0					
wpt990	50H	358603	6270245	Unknown Euc	15-20	>50	0					
wpt991	50H	358001	6270039	Unknown Euc	15-20	>50	0					
wpt992	50H	358002	6270051	Unknown Euc	15-20	>50	0					
wpt993	50H	358002	6270062	Unknown Euc	15-20	>50	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt994	50H	358004	6270077	Unknown Euc	15-20	>50	0					
wpt995	50H	358002	6270090	Unknown Euc	15-20	>50	0					
wpt996	50H	358302	6270763	Unknown Euc	15-20	>50	0					
wpt997	50H	358303	6270755	Unknown Euc	15-20	>50	0					
wpt998	50H	358304	6270747	Unknown Euc	15-20	>50	0					
wpt999	50H	358304	6270730	Unknown Euc	15-20	>50	0					

# **APPENDIX E**

## **SIGNIFICANT SPECIES PROFILES**



### **Swan Coastal Plain Shield-backed Trapdoor Spider *Idiosoma sigillatum***

Status and Distribution: Listed as Priority 3 by the DBCA. NatureMap records (204 in total) are mainly on the Swan Coastal Plain and stretch from just south of Lancelin to Elgin (24km north of the subject site).

Habitat: Poorly documented but burrows of this species are usually found in *Banksia* woodland and heathland on sandy soils.

Likely presence within the subject site: Habitat within the subject site and along the proposed haul road route appears unsuitable for this species.

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Carter's Freshwater Mussel *Westralunio carteri***

Status and Distribution: Listed as Scheduled 3 under the *BC Act* and as Vulnerable under the *EPBC Act*. Carter's freshwater mussel is the only freshwater mussel species endemic to south-western WA, ranging from the Moore River south to the Frankland River (Morgan *et al.* 2011).

Habitat: Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots. Salinity tolerance is quite low (Morgan *et al.* 2011).

Likely presence within the subject site: The two small seasonal creek lines present appear to not represent suitable habitat for this species, though it is known to occur in the lower reaches of the Abba River where permanent water occurs.

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Pouched Lamprey *Geotria australis***

Status and Distribution: Listed as Priority 1 by the DBCA. Status is secure but abundance has decreased due to proliferation of obstacles to upstream spawning migration such as dams and weirs. A southern hemisphere species. Western Australian distribution includes coastal drainages of the south west from Perth to Albany (Allen *et al.* 2003).

Habitat: 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 (Allen *et al.* 2003).

Likely presence within the subject site: The two small seasonal creek lines present appear to not represent suitable habitat for this species. Never recorded in this specific catchment area (NatureMap 2019).

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Balston's Pygmy Perch *Nannatherina balstoni***

Status and Distribution: Listed as Scheduled 1 under the *BC Act* and as Vulnerable under the *EPBC Act*. Morgan *et al.* (1996) states that this fish is the rarest of all the endemic fish of the south west. Status is defined as fairly secure by Allen *et al.* (2003) presumably given that, on the south coast, significant areas of habitat are within national parks. Confined to drainages and wetlands near the coast from between Margaret River and Two Peoples Bay. Historical records from Moore River.

Habitat: 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 (Allen *et al.* 2003). Morgan (1996) found them most common in shallow pools and creeks that often dry up in summer. Lower numbers were observed in the permanent major rivers surveyed.

Likely presence within the subject site: Appears to have never been recorded in the Geographe catchment (NatureMap 2019) and the subject site is well outside of the current documented distribution of this species.

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Coastal Plains Skink *Ctenotus ora***

Status and Distribution: Listed as Priority 3 by DBCA. *Ctenotus ora* is a recently described species of medium sized skink with a restricted range in the south-west of Western Australia, most of which has been cleared for agriculture and urban development. It cannot reliably be distinguished from the more widespread *C. labillardieri* except by DNA sequences, but the two species appear to have disjunct distributions. Based on only five specimens reliably identified as *Ctenotus ora*, the species is apparently restricted to the

southern Swan Coastal Plain and Cape Naturaliste area, as far north as Pinjarra and south as far as Yallingup (Kay & Keogh 2012).

Habitat: Sandy substrates with low vegetation (including heath) in open *Eucalyptus/Corymbia* woodland over *Banksia* (Kay & Keogh 2012). Individuals have been found sheltering under *Banksia* logs on white sand and trapped in eucalypt woodland with *Banksia* or peppermint mid-storey, or heath (Bamford *et al.* 2010). Open eucalypt woodland over *Banksia* and low vegetation on sandy coastal plain and coastal dunes (Wilson and Swan 2017).

Likely presence within the subject site: Status of this species within the subject site is difficult to determine without a detailed survey, however, given the small extent of what appears to be marginal habitat and its generally degraded state it is not anticipated to be present.

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Australasian Bittern *Botaurus poiciloptilus***

Status and Distribution: Classified as Schedule 2 under the *BC Act* and as Endangered under the *EPBC Act*. The species is uncommon to rare (Morcombe 2004), but locally common in wetter parts of south west (Johnstone and Storr 1998). Occurs north to Moora and east to Mt Arid (Johnstone and Storr 1998).

Habitat: Freshwater wetlands, occasionally estuarine; prefers heavy vegetation (Morcombe 2004) such as beds of tall dense *Typha*, *Baumea* and sedges in freshwater swamps (Johnstone and Storr 1998).

Likely presence within the subject site: The subject site contains no suitable habitat for this species.

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Blue-billed Duck *Oxyura australis***

Status and Distribution: Listed as Priority 4 by DBCA. Rare to moderately common (most plentiful on the Swan Coastal Plain and in the Great Southern). South-western: north to Lake Pinjarrega and east to Esperance; vagrant further north and east (as far as

Thundelarra and Kalgoorlie). Also south-eastern Australian and Tasmania (Johnstone and Storr 1998).

Habitat: Well vegetated freshwater swamps, large dams and lakes (Pizzey and Knight 2012), winters on more open water (Morcombe 2004). Occasionally salt lakes and estuaries freshened by floodwaters (Johnstone and Storr 1998).

Likely presence within the subject site: The subject site contains no suitable habitat for this species.

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Glossy Ibis *Plegadis falcinellus***

Status and Distribution: This species is listed as Schedule 5 under the *BC Act* and as Migratory under the *EPBC Act* and under international agreements to which Australia is a signatory. The glossy ibis frequents swamps and lakes throughout much of the Australian mainland, but is most numerous in the north. It is a non-breeding visitor to Tasmania and the south-west of Western Australia. The glossy ibis is both migratory and nomadic. Its range expands inland after good rains, but its main breeding areas seem to be in the Murray-Darling Basin of New South Wales and Victoria, the Macquarie Marshes in New South Wales, and in southern Queensland. Glossy Ibis often move north in autumn, then return south to their main breeding areas in spring and summer (Pizzey & Knight 2012).

Habitat: Well vegetated wetlands, wet pastures, rice fields, floodwaters, floodplains, brackish or occasionally saline wetlands, mangroves, mudflats, occasionally dry grasslands (Pizzey & Knight 2012).

Likely presence within the subject site: The species is only recorded in the south west very sporadically and in small numbers. While it may occur occasionally its frequency of occurrence would be extremely low and temporary and therefore it does not warrant consideration.

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Migratory Shorebirds**

A number of migratory shorebirds are listed in various databases and publications as potentially occurring in the general area. Not all specific species are discussed in detail.

Status and Distribution: Migratory shorebirds are listed under Schedule 5 of the *BC Act*, as Migratory under the *EPBC Act* and under various international agreements to which Australia is a signatory. All species are either widespread summer migrants to Australia or residents. State and Federal conservation status varies between species.

Habitat: Varies between species but includes beaches and permanent/temporary wetlands varying from billabongs, swamps, lakes, floodplains, sewerage farms, saltwork ponds, estuaries, lagoons, mudflats sandbars, pastures, airfields, sports fields and lawns.

Likely presence within the subject site: The subject site contains no suitable habitat for migratory shorebirds.

No migratory shorebirds are considered potential species based on currently available information.

Potential impact of proposed development: The closest, most significant area of migratory shorebird habitat is represented by the Vasse – Wonnerup Estuary situated about 8km north west of the subject site. The two seasonal creek lines which pass through the subject site ultimately drain into this water body. It is considered extremely unlikely that any of the activities proposed at the mine site will have any impact the Vasse – Wonnerup Estuary or the migratory shorebirds which frequent it. (Note: there are already two existing mineral sand operations between the Yalyalup site and the estuary with not impacts being reported).

It is therefore concluded that no impact on migratory shorebirds or their preferred habitat will occur.

### **Eastern Osprey *Pandion haliaetus***

Status and Distribution: This species is listed as Schedule 5 under the *BC Act*, as Migratory under the *EPBC Act* and under some international agreements to which Australia is a signatory. Moderately common to very common in sheltered seas around the north and west coast islands south to 31°S; uncommon to common on mainland coasts, estuaries and large rivers north of tropic, rare to uncommon elsewhere (Johnstone and Storr 1998).

Habitat: Coasts, estuaries, bays, inlets, islands, and surrounding waters, coral atolls, reefs, lagoons, rock cliffs and stacks. Ascends larger rivers (Pizzey & Knight 2012). Construct nests on prominent headland, large trees, communication towers (Simpson & Day 2010).

Likely presence within the subject site: The subject site contains no suitable habitat for this species.

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Peregrine Falcon *Falco peregrinus***

Status and Distribution: This species is listed as Schedule 7 under the *BC Act*. Individuals of this species are uncommon/rare but wide ranging across Australia. Moderately common at higher levels of the Stirling Range, uncommon in hilly, north west Kimberley, Hamersley and Darling Ranges; rare or scarce elsewhere (Johnstone and Storr 1998).

Habitat: Diverse from rainforest to arid shrublands, from coastal heath to alpine (Morcombe 2004). Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes (Johnstone and Storr 1998). The species utilises the ledges, cliff faces and large hollows/broken spouts of trees for nesting. It will also occasionally use the abandoned nests of other birds of prey.

Likely presence within the subject site: This species potentially utilises some sections of the subject site as part of a much larger home range though it is only likely to occur infrequently. No evidence of nesting seen.

Listed as a potential species based on available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Masked Owl *Tyto novaehollandiae novaehollandae***

Status and Distribution: Listed as Priority 3 by DBCA. Found north to Yanchep and east to Yealering, Gnowangerup and Albany, casual further north. Locally common in south west (e.g. Margaret River area) but generally uncommon (Johnstone and Storr 1998).

Habitat: Roosts and nests in heavy forest, hunts over open woodlands and farmlands (Morcombe 2004). Probably breeding in forested deep south west with some autumn–winter wanderings northwards (Johnstone and Storr 1998).

Likely presence within the subject site: May occasionally reside in general area though status uncertain. It is unlikely to be specifically attracted to the site.

Not listed as a potential species as it would most probably only ever occur rarely.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Fork-tailed Swift *Apus pacificus***

Status and Distribution: The fork-tailed swift is listed as Schedule 5 under the *BC Act*, as Migratory under the *EPBC Act* and under some international agreements to which Australia is a signatory. It is a summer migrant (Oct-Apr) to Australia (Morcombe 2004).



Habitat: Low to very high airspace over varied habitat from rainforest to semi desert (Morcombe 2004).

Likely presence in subject site: This species is potentially a very occasional summer visitor to the subject site but is entirely aerial and largely independent of terrestrial habitats. Would only occur very infrequently and then only for very brief periods of time.

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Grey Wagtail *Motacilla cinerea***

Status and Distribution: The grey wagtail is listed as Schedule 5 under the *BC Act* and as Migratory under the *EPBC Act* including international agreements to which Australia is a signatory. A rarely recorded, accidental vagrant that has on a few occasions been recorded on widely separated parts of the Australian coastline (Pizzey & Knight 2012).

Habitat: In Australia, near running water in disused quarries, sandy, rocky streams in escarpments and rainforest, sewerage ponds, ploughed fields and airfields (Pizzey & Knight 2012).

Likely presence within the subject site: A highly occasional vagrant. Rarely recorded in the south west and even less inland.

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Carnaby's Black-Cockatoo *Calyptrorhynchus latirostris***

Status and Distribution: Carnaby's black cockatoos are listed as Scheduled 2 under the *BC Act* and as Endangered under the *EPBC Act*. Confined to the south-west of Western Australia, north to the lower Murchison River and east to Nabawa, Wilroy, Waddi Forest, Nugadong, Manmanning, Durokoppin, Noongar (Moorine Rock), Lake Cronin, Ravensthorpe Range, head of Oldfield River, 20 km ESE of Condingup and Cape Arid; also casual on Rottnest Island (Johnstone and Storr 1998).

Habitat: Forests, woodlands, heathlands, farms; feeds on Banksia, Hakeas and Marri. Carnaby's cockatoo has specific nesting site requirements. Nests are mostly in smoothed-barked eucalypts with the nest hollows ranging from 2.5 to 12m above the ground, an entrance from 23-30cm diameter and a depth of 0.1-2.5m (Johnstone and Storr, 1998).

Breeding occurs in winter/spring mainly in eastern forest and wheatbelt where they can find mature hollow bearing trees to nest in (Morcombe 2004). Judging from records in the Storr-Johnstone Bird Data Bank, this species is currently expanding its breeding range westward and south into the Jarrah – Marri forest of the Darling Scarp and into the Tuart forests of the Swan Coastal Plain including the region between Mandurah and Bunbury. Carnaby's black cockatoo has been known to breed close to the town of Mandurah, as well as at Dawesville, Lake Clifton and Baldivis (pers. comm., Ron Johnstone, WA Museum) and there are small resident populations on the southern Swan Coastal Plain near Mandurah, Lake Clifton and near Bunbury. At each of these sites the birds forage in remnant vegetation and adjacent pine plantations (Johnstone 2008).

Carnaby's black-cockatoo lays eggs from July or August to October or November, with most clutches being laid in August and September (Saunders 1986). Birds in inland regions may begin laying up to three weeks earlier than those in coastal areas (Saunders 1977). The female incubates the eggs over a period of 28-29 days. The young depart the nest 10–12 weeks after hatching (Saunders 1977; Smith & Saunders 1986).

Likely presence within the subject site: Small areas of favoured foraging habitat (i.e. marri, jarrah, banksia and pines) present. Evidence of foraging observed in the form of chewed marri fruits and pine cones. Larger trees (>50cm DBH) can be considered potential breeding habitat. No roosting sites identified.

Listed as a potential species based on currently available information.

Potential impact of proposed development: A very small number of potential habitat trees and small areas of foraging habitat may require removal but no significant impact on this species or its preferred habitat is anticipated.

### **Baudin's Black-Cockatoo *Calyptorhynchus baudinii***

Status and Distribution: Listed as Scheduled 3 under the *BC Act* and as Vulnerable under the *EPBC Act*. Confined to the south-west of Western Australia, north to Gidgegannup, east to Mt Helena, Wandering, Quindanning, Kojonup, Frankland and King River and west to the eastern strip of the Swan Coastal Plain including West Midland, Byford, Nth Dandalup, Yarloop, Wokalup and Bunbury (Johnstone and Storr 1998). On the southern Swan Coastal Plain this cockatoo is in some areas resident but mainly a migrant moving from the deep south-west to the central and northern Darling Range. Between March and September most flocks move north and are concentrated in the northern parts of the Darling Range. During this period birds forage well out onto the southern Swan Coastal Plain to areas such as Harvey, Myalup, Bunbury, Capel, Dunsborough and Meelup. While generally more common in the Darling Range this species can also be common on parts of the southern Swan Coastal Plain especially in mid-August – September when flocks begin to return to their breeding quarters (Johnstone 2008).

Habitat: Mainly eucalypt forests where it feeds primarily on the Marri seeds, (Morcombe, 2004), Banksia, Hakeas and *Erodium* sp. Also strips bark from trees in search of beetle larvae (Johnstone and Storr 1998). This species of cockatoo nests in large tree hollows, 30–40 cm in diameter and more than 30 cm deep (Saunders 1974).

Baudin's black-cockatoo breeds in late winter and spring, from August to November or December (Gould 1972; Johnstone 1997; Saunders 1974; Saunders *et al.* 1985). Eggs laid in October (Johnstone and Storr 1998). Based on observations at currently known nest sites breeding mainly occurs within the October-December period (Ron Johnstone pers. comm.). Incubation is 28 – 30 days. Young fledge at 8 to 9 weeks (Simpson and Day 2004).

Likely presence within the subject site: Small areas of favoured foraging habitat (i.e. marri, banksia and pines) present. Evidence of foraging attributed to this species observed in the form of chewed marri fruits. Larger trees ( $\geq 50$ cm DBH) can be considered potential breeding habitat. No roosting sites identified.

Listed as a potential species based on currently available information.

Potential impact of proposed development: A very small number of potential habitat trees and small areas of foraging habitat may require removal but no significant impact on this species or its preferred habitat is anticipated.

### **Forest Red-tailed Black-Cockatoo *Calyptorhynchus banksii naso***

Status and Distribution: Listed as Scheduled 3 under the *BC Act* and as Vulnerable under the *EPBC Act*. Found in the humid and subhumid south west, mainly hilly interior, north to Gingin and east to Mt Helena, Christmas Tree Well, North Bannister, Mt Saddleback, Rock Gully and the upper King River (Johnstone and Storr 1998).

Habitat: Eucalypt forests, feeds on marri, jarrah, blackbutt, karri, sheoak and snottygobble. The forest red-tailed black cockatoo nests in the large hollows of marri, jarrah and karri (Johnstone and Kirkby 1999). In marri, the nest hollows of the forest red-tailed black cockatoo range from 8-14m above ground, the entrance is 12 – 41cm in diameter and the depth is one to five metres (Johnstone and Storr 1998).

Breeding commences in winter/spring. There are few records of breeding in the forest red-tailed black cockatoo (Johnstone and Storr 1998), but eggs are laid in October and November (Johnstone 1997; Johnstone and Storr 1998).

Recent data however indicates that breeding in all months of the year occurs with peaks in spring and autumn–winter (Ron Johnstone pers. comm.). Incubation period 29 – 31 days. Young fledge at 8 to 9 weeks (Simpson and Day 2010).

Likely presence within the subject site: 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. Larger trees ( $\geq 50$ cm DBH) can be considered potential breeding habitat. No roosting sites identified.

Listed as a potential species based on currently available information.

Potential impact of proposed development: A very small number of potential habitat trees and small areas of foraging habitat may require removal but no significant impact on this species or its preferred habitat is anticipated.

### **Chuditch *Dasyurus geoffroi***

Status and Distribution: Listed as Scheduled 3 under the *BC Act* and as Vulnerable under the *EPBC Act*. Formerly occurred over nearly 70 per cent of Australia. The chuditch now has a patchy distribution throughout the jarrah forest and mixed karri/marri/jarrah forest of southwest Western Australia. Also occurs in very low numbers in the Midwest, Wheatbelt and South Coast Regions with records from Moora to the north, Yellowdine to the east and south to Hopetoun.

Habitat: Chuditch are known to have occupied a wide range of habitats from woodlands, dry sclerophyll (leafy) forests, riparian vegetation, beaches and deserts. Riparian vegetation appears to support higher densities of chuditch, possibly because food supply is better or more reliable and better cover is offered by dense vegetation. Chuditch appear to utilise native vegetation along road sides in the wheatbelt (CALM 1994). The estimated home range of a male chuditch is over 15 km<sup>2</sup> whilst that for females is 3-4 km<sup>2</sup> (Sorena and Soderquist 1995).

Likely presence within the subject site: This species has been recorded along the Whicher Scarp occasionally (Bancroft and Bamford 2008, G. Harewood pers. obs. 2013) but populations could not persist on the coastal plain due to suitable habitat being absent or highly fragmented and small.

Not listed as a potential species based on available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **South-western Brush-tailed Phascogale *Phascogale tapoatafa wambenger***

Status and Distribution: Listed as Scheduled 6 under the *BC Act*. Present distribution is believed to have been reduced to approximately 50 per cent of its former range. Now known from Perth and south to Albany, west of Albany Highway. Occurs at low densities in the northern jarrah forest. Highest densities occur in the Perup/Kingston area, Collie River valley, and near Margaret River and Busselton (DBCA information pamphlet). Records are less common from wetter forests. Local records from Kemerton, Stratham, Binningup,

Busselton, Capel, Dardanup, College Grove, Gwindinup, Yoongarillup and Dalyellup (G. Harewood pers. obs.).

Habitat: This subspecies has been observed in dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover. A nocturnal carnivore relying on tree hollows as nest sites. The home range for a female brush-tailed phascogale is estimated at between 20 and 70 ha, whilst that for males is given as twice that of females. In addition, they tend to utilise a large number (approximately 20) of different nest sites throughout their range (Soderquist 1995). Can also persist in floristically degraded areas such as relatively dense and continuous, but parkland cleared woodland in farmland (G. Harewood pers. obs.).

Likely presence within the subject site: Habitat appears too degraded and/or fragmented to support a population of this species.

Not listed as a potential species based on available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

#### **Quenda *Isoodon fusciventer***

Status and Distribution: Listed as Priority 4 by DBCA. Widely distributed in the south west from near Cervantes north of Perth to east of Esperance, patchy distribution through the Jarrah and Karri forest and on the Swan Coastal Plain, and inland as far as Hyden. Has been translocated to Julimar State Forest, Hills Forest Mundaring, Tutanning Nature Reserve, Boyagin Nature Reserve, Dongolocking Nature Reserve, Leschenault Conservation Park, and Karakamia and Paruna Sanctuaries (DBCA information pamphlet) and Nambung and Yalgorup National Parks (DBCA pers. coms.).

Habitat: Dense scrubby, often swampy, vegetation with dense cover up to one metre high, often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover. Populations inhabiting Jarrah and Wandoo forests are usually associated with watercourses. Quendas can thrive in more open habitat subject to exotic predator control (DBCA information pamphlet).

Likely presence within the subject site: Habitat appears too degraded and/or fragmented to support a population of this species.

Not listed as a potential species based on available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Western Ringtail Possum *Pseudocheirus occidentalis***

Status and Distribution: Listed as Scheduled 1 under the *BC Act* and as Critically Endangered under the *EPBC Act* though recent survey work indicated it is far more common and widespread than previously documented (Biota 2019 in preparation). Common in suitable habitat (de Tores 2008). The species is widespread and relatively common in vegetated remnants within the Swan Coastal Plain and along the Whicher Scarp between Bunbury and Busselton (G. Harewood pers. obs.). The highest densities of this species are recorded in Peppermint habitat near Busselton area (de Tores 2008).

The western ringtail possum has a restricted distribution in south-western Western Australia. Most known populations (natural and translocated) are now restricted to near coastal areas of the south west from the Dawesville area to the Waychinicup National Park. Inland, it is also known to be relatively common in a small part of the lower Collie River valley, the Perup Nature Reserve and surrounding forest blocks near Manjimup. It has also been recorded in stands of Peppermint near the Harvey River and in Jarrah/Marri forest near Collie; however, the long term persistence of the species in these areas is not confirmed (de Tores *et al.* 2004). The western ringtail possum was formerly more widespread: in the 1970s it was known from *Casuarina* woodlands in the wheatbelt near Pingelly (south-east of Perth), and it is thought to have once occurred throughout much of south-western Western Australia (but not necessarily continuously distributed) (Maxwell *et al.* 1996; de Tores 2008).

Habitat: The western ringtail possum was once located in a variety of habitats including coastal peppermint, coastal peppermint-tuart, jarrah-marri associations, sheoak woodland, and eucalypt woodland and mallee. Coastal populations mostly inhabit peppermint-tuart associations with highest densities in habitats with dense, relatively lush vegetation. In these areas the main determinants of suitable habitat for WRPs appears to be the presence of *Agonis flexuosa* either as the dominant tree or as an understorey component of eucalypt forest or woodland (Jones *et al.* 1994a). Inland, the largest known populations occur in the Upper Warren area east of Manjimup (Wayne *et al.* 2005). In this area the peppermint tree is naturally absent and jarrah-marri associations constitute the species refuge and foraging habitat. In areas where peppermint is absent or rare WRPs have been observed feeding predominately on young jarrah, *Nuytsia floribunda* and *Allocasuarina fraseriana* (G Harewood pers. obs.).

Likely presence within the subject site: The results of the WRP assessment indicate that this species is present in suitable habitat along the McGibbon Track. No evidence of its presence was found elsewhere. The vast majority of the subject site contains no suitable habitat for this species given it is mostly cleared.

Listed as a potential species based on available information.



Potential impact of proposed development: The proposed development footprint does not intersect areas where this species has been recorded within the subject site or along the proposed haul road route and therefore no direct impact on this species or its preferred habitat is anticipated.

### **Quokka *Setonix brachyurus***

Status and Distribution: Listed as Scheduled 3 under the *BC Act* and as Vulnerable under the *EPBC Act*. Rare and restricted in south west W.A. from south of Perth to Two Peoples Bay. The distribution of the Quokka includes Rottnest and Bald Islands, and at least 25 known sites on the mainland, including Two Peoples Bay Nature Reserve, Torndirrup National Park, Mt Manypeaks National Park, Walpole-Nornalup National Park, and various swamp areas through the south-west forests from Jarrahdale to Walpole. Only known population on the coastal plain is located just south of Bunbury (Stratham).

Habitat: Mainland populations of this species are currently restricted to densely vegetated coastal heaths, swamps, riverine habitats including tea-tree thickets on sandy soils along creek systems where they are less vulnerable to predation. The species is nocturnal.

Likely presence within the subject site: The subject site contains no suitable habitat for this species.

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Western Brush Wallaby *Notamacropus irma***

Status and Distribution: Listed as Priority 4 by DBCA. The western brush wallaby is distributed across the south-west of Western Australia from north of Kalbarri to Cape Arid (DBCA information pamphlet).

Habitat: The species optimum habitat is open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heathland and is uncommon in karri forest (DBCA information pamphlet).

Likely presence within the subject site: The subject site contains no suitable habitat for this species.

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

**Woylie *Bettongia penicillata ogibyi***

Status and Distribution: Listed as Schedule 1 under the *BC Act* and as Endangered under the *EPBC Act*. Restricted to remnant habitat patches in south west WA where populations are managed by way of fox control and reintroduction programs (e.g. Avon Valley, Walyunga National Park and Paruna Sanctuary).

Habitat: Open forest and woodland with a low, dense, understorey of tussock grasses or woody scrub. Formerly occurred in a wider range of habitats including spinifex hummock grasslands.

Likely presence within the subject site: The subject site contains no suitable habitat for this species.

Not listed as a potential species based on available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

**Western False Pipistrelle *Falsistrellus mackenziei***

Status and Distribution: Listed as Priority 4 by DBCA and as near threatened by the ICUN. Confined to south west W.A. south of Perth and east to the wheat belt. Most records are from karri forests but also recorded in wetter stands of jarrah and tuart and other woodlands on the Swan Coastal Plain (Menkhorst and Knight 2011). Range appears to be contracting southwards, presumably due to drying climate (Bullen pers. comm.).

Habitat: This species of bat occurs in high forest and coastal woodlands. It roosts in small colonies (5-30 individuals) in hollow trees, branches and stumps. Forages between the canopy and the understory of tall forest trees (Churchill 2008).

Likely presence within the subject site: Habitat appears too degraded and/or fragmented to support a population of this species.

Not listed as a potential species based on available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

**Water Rat *Hydromys chrysogaster***

Status and Distribution: Listed as Priority 4 by DBCA. The water rat is widely distributed around Australia and its offshore islands, New Guinea and some adjacent islands. It occurs in fresh brackish water habitats in the south-west of Western Australia but occurs in marine environments along the Pilbara coastline and offshore islands. Previous survey work in the

south west suggested this species was relatively common and widespread though difficult to capture (Christensen *et al.* 1985, How *et al.* 1987).

Habitat: The water rat occupies habitat near permanent water, fresh, brackish or marine. Likely to occur in all major rivers and most of the larger streams as well as bodies of permanent water in the lower south west (Christensen *et al.* 1985).

Likely presence within the subject site: The two small seasonal creek lines present appear to not represent suitable habitat for this species, though it may occur in both creek systems further downstream.

Not considered a potential species based on currently available information.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

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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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