

Fauna Assessment

Lot 287



South Western Highway Gwindinup

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On behalf of:

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Acronyms/Abbreviations:

ALA: Atlas of Living Australia 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 DPaW), WA Government.

CAMBA: China Australia Migratory Bird Agreement 1998.

CBD: Central Business District.

DBH: Diametre at Breast Height – tree measurement.

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

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

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

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

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

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

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

DoP: Department of Planning, WA Government.

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

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

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

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

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

EPA: Environmental Protection Authority, WA Government.

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

ha: Hectare (10,000 square metres).

IBRA: Interim Biogeographic Regionalisation for Australia.

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

JAMBA: Japan Australia Migratory Bird Agreement 1981.

km: Kilometre.

m: Metre.

mm: Millimetre.

P: Priority - DPaW fauna conservation ranking.

POS: Public Open Space.

RAOU: Royal Australia Ornithologist Union.

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 Lot 287, South Western Highway Gwindinup (the subject site). Lot 287 has a total area of about 60 ha. About 31 ha of the subject site was historically cleared and subsequently used for an extraction industry operation and bluegum plantations. The balance of the area (~19 ha) contains remnant native vegetation (~19 ha).

It is understood that the landowner (Mr Mario Giacci) is investigating the potential to expand the existing extractive industry operation within the subject site. 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 which will be used during the ongoing planning and approval process.

The scope of works was to conduct a level 1 fauna survey as defined by the EPA (EPA 2016). Because some listed threatened species (i.e. three species of black cockatoo) are known to occur in the general area, the scope of the survey work was expanded to include targeted assessment of the site's significance to these particular species. The assessment has included a literature review ("desktop study"), a series of day time surveys carried out in February 2018.

With respect to native vertebrate fauna, 29 mammal (including nine bat species), 92 bird, 36 reptile and three 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.

Descriptions and example images of the main fauna habitats/dominant vegetation present within the subject site are provided in Table 1, with the location and extent of each unit being depicted in Figure 3.

The remnant native vegetation remaining within the subject site is in general terms comprised of various densities of jarrah, marri/mountain marri and banksia over shrubland on pisolitic gravel or sandy pisolitic gravel. The majority appears to have been subject to historical logging with most trees being relatively young in age. Groundcover is generally sparse suggesting historical clearing, grazing and/or frequent fires. Some small areas have been subject to gravel extraction in the past and subsequently partially regenerated.

Overall fauna habitat quality appears to be good and it can be expected that a high percentage of the predicted species (Appendix B) would utilise the subject site.

Opportunistic fauna observations made during the survey period are listed in Appendix B. A total of 25 fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the subject site during the day time surveys.

The black cockatoo habitat assessment identified 405 trees within the subject site with a DBH of >50cm. Most (330 – 81.5%) of these trees did not appear to contain hollows of any size. Forty nine (~12.1%) were assessed as possibly having hollows, but of a likely size or orientation

that was deemed unsuitable for black cockatoos to utilise. Twenty six (6.4%) appeared to contain hollows possibly large enough for black cockatoos to use for nesting, though this assessment was based on the size of the entrance into an apparent hollow only. No conclusive evidence of any hollows being used by black cockatoos for nesting (currently or previously) was seen though two hollows appeared to have significant rub marks which indicates use by fauna of some type, possibly common brushtail possums.

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

Evidence of all two species of black cockatoos foraging within the subject site was observed. The main foraging evidence left was in the form of chewed marri/mountain fruits, with most of this evidence being attributed to the forest red-tailed black-cockatoo. A small number of examples of Baudin's foraging on marri was also seen.

Almost all (~19 ha) of the remnant native vegetation within the subject site can be regarded as foraging habitat for black cockatoos given the presence of the marri, jarrah and banksia in various concentrations in all remnants. No existing roosting trees (trees used at night by black cockatoos to rest) were positively identified during the survey.

Besides the two species of black cockatoo recorded, evidence of one additional fauna species of conservation significance was observed during the survey period, this being the western ringtail possum. Evidence of this species was found in the form of some scats under a tree and a nearby drey (unoccupied).

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

- forest red-tailed black cockatoo – Vulnerable (WA/Federal);
- Baudin's black cockatoo – Endangered (WA/Federal); and
- western ringtail possum – Critically Endangered (WA/Federal).

An additional nine species of conservation significance may also utilise the subject site, though, as no evidence of these species presence was identified during the field survey, the status of some in the area remains uncertain. These species are:

- coastal plains skink – P3 (DBCA Priority Species);
- masked owl – P3 (DBCA Priority Species);
- south-western brush-tailed phascogale - S6 (WC Act);
- Carnaby's cockatoo – Endangered (WA/Federal);
- peregrine falcon – Schedule 7 (WA);
- quenda – Priority 4 (WA);

- western brush wallaby - Priority 4 (WA); and
- western false pipistrelle – P4 (DBCA Priority Species).

One invertebrate species of conservation significance has also been assessed as possibly occurring based on available information. The western pygmy trapdoor spider (Priority 3) has been collected in a state forest near the subject site (DBCA 2019) so it must be regarded as a potential species though its actual status within the subject site is unknown.

The exact location of proposed development within the subject site is yet to be finalise. Ongoing planning will need to take into account the potential presence of habitat used by some species of conservation significance and fauna in general so that any direct and indirect impacts can be avoided or minimised. Management plans and protocols that aim to minimise impact on fauna and fauna habitat should be employed if considered warranted.

1. INTRODUCTION

This report details the results of a fauna assessment of Lot 287, South Western Highway Gwindinup (the subject site) (Figures 1 and 2).

Lot 287 has a total area of about 60 ha. About 14 ha of the subject site was historically cleared and subsequently used for an extraction industry operation with the balance of the area containing a bluegum plantation (~27 ha) and remnant native vegetation (~19 ha).

It is understood that the landowner (Mr Mario Giacci) is investigating the potential to expand the existing extractive industry operation within the subject site. 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 which will be used during the ongoing planning and approval process.

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 black cockatoos the scope of the survey work was expanded to include a baseline assessment of the sites significance to these species as well. The fauna assessment has therefore included:

1. Level 1 fauna assessment (in accordance with EPA (2016) guidelines);
2. Targeted searches for black cockatoo habitat/site use (habitat trees, existing and potential nest hollows, foraging and roosting habitat);
3. Report summarising methods, results 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 conservation significant fauna potentially occurring within the subject site:

- DBCA's NatureMap Database Search (combined data from DBCA, ALA, WAM, BA and consultant's reports) (DBCA 2019); 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 species have become locally or regionally extinct.

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

3.1.2 Previous Fauna Surveys in the Area

Fauna surveys, assessments and reviews have been undertaken in nearby areas in the past, though not all are publicly available and could not be referenced. The most significant of those available have been used as the primary reference material for compiling 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.
- 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.
- 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.
- Harewood, G. (2017). Fauna Assessment of Lot 3833 (Part) Hyder Road – Yoganup Extended. Unpublished report for Iluka Resources Ltd.
- Harewood, G. (2018). Western Ringtail Possum 2018 Monitoring Survey, Gwindinup North Mineral Sands Mine, June/July 2018. Unpublished report for Cristal Mining Australia Limited. September 2016.
- 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 Department of the Environment and Energy (DotEE);

- *Wildlife Conservation Act 1950 (WC 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 *Biodiversity Conservation Act 2016 (BC Act)*;
- Red List produced by the Species Survival Commission (SSC) of the World Conservation Union (also known as the IUCN Red List - the acronym derived from its former name of the International Union for Conservation of Nature and Natural Resources). The Red List has no legislative power in Australia but is used as a framework for State and Commonwealth categories and criteria; and the
- DBCA Priority Fauna list. A non-statutory list maintained by the DBCA for management purposes (DBCA 2018).

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

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

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

Most, but not all migratory bird species listed in the annexes to these bilateral agreements are also protected in Australia as matters of national environmental significance (NES) under the *EPBC Act*.

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

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).

No assessment of the potential for SREs to be present has been made as it can be difficult to identify significant invertebrate species due to uncertainties in determining the range-restrictions of many species due to lack of surveys, lack of taxonomic resolutions within target taxa and problems in identifying certain life stages.

Where invertebrates are collected during surveys, a high percentage are likely to be unknown, or for known species there can be limited knowledge or information on their distribution (Harvey 2002).

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/central forest region. Populations do however persist outside of this area.
- **Unlikely to Occur:** The subject site is outside of the currently documented distribution for the species in question, or no suitable habitat (type, quality and extent) was identified as being present during the field assessment. Individuals of some species may occur occasionally as vagrants/transients especially if suitable habitat is located nearby but the subject site itself would not support 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 vertebrate fauna species used in this report is generally taken from the DBCA's WA Fauna Census Database which is assumed to follow Aplin and Smith (2001) for amphibians and reptiles and Johnstone (2001) for birds. Jackson and Groves (2015) has been used for mammals.

Common names are taken from the Western Australia Museum (WAM) recognised primary common name listings when specified, though where common names are not provided, they have been acquired from other publications. Sources include Cogger (2014), Wilson and Swan (2017), Van Dyck & Strahan (2013), Christidis and Boles (2008), Bush *et al.* (2010), Bush *et al.* (2007), Tyler & Doughty (2009), and Glauret (1961). Not all common names are generally accepted.

3.2 SITE SURVEYS

Daytime field survey work at the subject site was carried out on the 27 and 28 February 2019. All survey work was done by Greg Harewood (Zoologist).

3.2.1 Fauna Habitat Assessment

The vegetation communities mapped by DMBC (DMBC 2019) during the flora and vegetation survey have been used to classify the area into broad habitat types. This information has been supplemented by observations made during the field assessment undertaken during the fauna assessment.

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

The vegetation communities and landforms present have been used to classify the area into broad habitat types. 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 daytime survey the habitats within the subject site were assessed and specific elements identified, if present, to determine the likelihood of listed species of conservation significance occurring and its likely overall value to them on a local and regional scale.

3.2.2 Opportunistic Fauna Observations

Opportunistic observations of fauna species were made during all field survey work which primarily involved a series of transects across the 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 Black Cockatoo Habitat Assessment

The following methods were employed to comply with the defined scope of works and are based on guidelines published by the federal DotEE (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.

3.2.3.1 Black Cockatoo Breeding Habitat

The black cockatoo breeding habitat assessment has involved the identification of all suitable breeding tree species within the subject site that have a Diameter at Breast Height (DBH) of equal to or over 50cm. The DBH of each tree was estimated using a pre-made 50 cm “caliper”.

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

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

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

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

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

- Tree < 50cm DBH or an unsuitable species (not assessed/recorded);
- Tree >50cm DBH, no hollows seen;
- Tree >50cm DBH, one or more hollows seen, none of which were considered suitable for black cockatoos to use for nesting; or
- Tree >50cm DBH, one or more hollows seen, with at least one considered suitable or possibly for black cockatoos to use for nesting.

For the purposes of this study a tree containing a potential 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) which appear 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).

3.2.3.2 Black Cockatoo Foraging Habitat

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

3.2.3.3 Black Cockatoo Roosting Habitat

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

3.2.4 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 other field work. 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.

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

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

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

5. RESULTS

5.1 POTENTIAL FAUNA INVENTORY – LITERATURE REVIEW

A list of fauna species considered most likely to occur in the 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 are not listed. The raw database search results from NatureMap (DBCA 2019) and the Protected Matters Search Tool (DotEE 2019) are contained within Appendix C.

The list of potential fauna takes into consideration that firstly the species in question is not known to be locally extinct and secondly that suitable habitat for each species, as identified during the habitat assessment, is present within 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, 29 mammals (includes nine bat species), 92 bird, 36 reptile and three 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 animals could also frequent the area.

Of the 154 native animals that are listed as potentially occurring in the area, seven are considered to be endangered/vulnerable or in need of special protection under State and/or Federal law. In addition, five DBCA priority species have also been listed as potentially present.

5.2 SITE SURVEYS

5.2.1 Fauna Habitat Assessment

The western section of the subject site located on the upper slope of the Whicher Scarp which is an arcuate north-facing scarp formed during the late Tertiary and early Pleistocene by marine erosion of underlying sedimentary rocks and in this area marks the inland limit of the Swan Coastal Plain (Note: in some documents the Whicher Scarp is referred to as being entirely within the Southern Jarrah Forest Biogeographic Sub-region e.g. EPA 2009). The eastern section of Lot 287 slopes down to a valley created by the Preston River.

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).

The remnant native vegetation remaining within the subject site is in general terms comprised of various densities of jarrah, marri/mountain marri and *banksia* over shrubland on pisolitic gravel or sandy pisolitic gravel. The majority appears to have been subject to historical logging with most trees being relatively young in age. Groundcover is generally sparse suggesting historical clearing, grazing and/or frequent fires. Some small areas have been subject to gravel extraction in the past and subsequently partially regenerated.

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 (data courtesy DMBC 2019).

Table 1: Main Fauna Habitats within the Subject Site

Unit	Fauna Habitat Description	Example Image
VT1	<p>Tall woodland of jarrah (<i>Eucalyptus marginata</i>) and marri (<i>Corymbia calophylla</i>) over low woodland of <i>Banksia grandis</i> over tall sparse shrubland of <i>Kunzea glabrescens</i> over low sparse shrubland of <i>Xanthorrhoea preissii</i>.</p> <p>Total Area = ~0.79 ha (1.7%)</p>	

Unit	Fauna Habitat Description	Example Image
VT2	<p>Tall woodland of jarrah (<i>E. marginata</i>) and marri (<i>C. calophylla</i>) over tall sparse shrubland of <i>Kunzea glabrescens</i> over low sparse shrubland of <i>Xanthorrhoea preissii</i> and <i>Xanthorrhoea gracilis</i>.</p> <p>Total Area = ~0.84 ha (~1.4%)</p>	
VT3	<p>Tall woodland of jarrah (<i>E. marginata</i>) and (<i>C. calophylla</i>) over low sparse shrubland of <i>Xanthorrhoea preissii</i> and <i>Hibbertia hypericoides</i></p> <p>Total Area = ~17.39 ha (~28.6%)</p>	
D	<p>Disturbed: Bluegum plantations, tracks and clearings</p> <p>Total Area = 40.98 ha (~68.3%)</p>	

Overall fauna habitat quality in areas of natural bushland appears to be good and it can be expected that a high percentage of the predicted species would utilise the subject site. For some species the habitat may however be marginal in quality, mainly due to the sparse nature of the ground cover generally present and also due to a lack of canopy connectivity, particularly in the midstorey vegetation.

Based on available vegetation mapping it is estimated that there is approximately 21,500 ha of native vegetation within 12 km the subject site. Remnant native vegetation present within the subject site (total ~19 ha) makes up ~0.088% of this total.

5.2.2 Opportunistic Fauna Observations

Opportunistic fauna observations are listed in Appendix B. A total of 25 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the subject site during the course of site surveys. Most of the fauna species recorded were common, widespread bird species.

Evidence of three listed threatened species was observed (forest red-tailed (Vulnerable) and Baudin’s black-cockatoo (Endangered) - chewed marri fruits at several locations and the western ringtail possum (Critically Endangered) – scats and a drey at one location). No evidence of any listed migratory or priority fauna species was found.

5.2.3 Black Cockatoo Habitat Assessment

5.2.3.1 Black Cockatoo Breeding Habitat

Trees considered potentially suitable for black cockatoos to use as nesting habitat (using DotEE criteria i.e. DBH \geq 50cm (Commonwealth of Australia 2012) but ultimately subject to a suitable hollow being present or developing and a range of other factors) which were found within the subject site comprised the following species:

- Jarrah - *Eucalyptus marginata*;
- Marri – *Corymbia calophylla*;
- Mountain Marri - *Corymbia haematoxylon*; and
- Dead unidentified species.

A summary of the potential black cockatoo habitat trees observed within the subject site area is provided in Table 2 below and their location shown in Figure 4.

Table 2: Summary of Potential Black Cockatoo Habitat Trees (DBH \geq 50cm) within the Subject Site

Total Number of Habitat Trees Recorded	Number of Trees with <u>No Hollows</u> Observed	Number of Trees with Hollows Considered <u>Unsuitable</u> for Nesting Black Cockatoos	Number of Trees with Hollows Considered <u>Possibly Suitable</u> for Nesting Black Cockatoos	Tree Species		
				Jarrah	Marri/Mountain Marri	Dead Unknown
405	330	49	26	249	141	15

The assessment identified 405 trees within the subject site with a DBH of ≥ 50 cm. Most (330 – 81.5%) of these trees did not appear to contain hollows of any size. Forty nine (~12.1%) were assessed as possibly having hollows, but of a likely size or orientation that was deemed unsuitable for black cockatoos to utilise. Twenty six (6.4%) appeared to contain hollows possibly large enough for black cockatoos to use for nesting, though this assessment was based on the size of the entrance into an apparent hollow only. No conclusive evidence of any hollows being used by black cockatoos for nesting (currently or previously) was seen though two hollows appeared to have significant rub marks which indicates use by fauna of some type, possibly common brushtail possums.

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

Based on available mapping, there is approximately 21,500 ha of remnant native vegetation within 12 kilometres of the subject site. Much of this is likely to contain “potential” breeding habitat (i.e. suitable tree species with a DBH ≥ 50 cm).

5.2.3.2 Black Cockatoo Foraging Habitat

Following is a list of the main plant species observed within the subject site that are known to be used as a direct food source (i.e. fruits or flowers) by one or more species of black cockatoo:

- Jarrah - *Eucalyptus marginata*;
- Marri - *Corymbia calophylla*;
- Bull Banksia – *Banksia grandis*;
- Couch Honey-pot Dryandra – *Banksia dallanneyi*;
- Honeybush – *Hakea lissocarpa* (and possibly *H. amplexicaulis*); and
- Balga - *Xanthorrhoea preissii* (and possibly *X. gracilis*)

Evidence of two species of black cockatoos foraging within the subject site was observed. The main foraging evidence left was in the form of chewed marri/mountain fruits, with most of this evidence being attributed to the forest red-tailed black-cockatoo. A small number of examples of Baudin’s foraging on marri was also seen.

Almost all (~19 ha) of the remnant native vegetation within the subject site can be regarded as foraging habitat for black cockatoos given the presence of the abovementioned plant species in various concentrations in all remnants.

Based on available vegetation mapping it is estimated that there is approximately 21,500 ha of native vegetation within 12 km the subject site, much of which is very likely to represent potential black cockatoo foraging habitat of some type.

5.2.3.3 Black Cockatoo Roosting Habitat

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

A review of the 2018 Great Cocky Count database shows no documented roost sites within the subject site. The closest active roost is located approximately 500 m north east of the subject site. This roost was in use by 193 White-tailed Black Cockatoos during the 2018 count (Peck *et al.* 2018). Another seven documented roost sites (but not necessarily in current use) occur within 12 km of the subject site.

5.2.4 Other Species of Conservation Significance

As indicated above and besides the two species of black cockatoo, evidence of one additional fauna species of conservation significance was observed during the survey period, this being the western ringtail possum. Evidence of this species was found in the form of some scats under a tree and a nearby drey (unoccupied).

No direct evidence of any other species of conservation significance being present was found however based on the habitats present an additional seven species are considered as potentially present though their actual status in the subject site is unknown. These species are discussed in more detail in the following sections.

5.3 FAUNA INVENTORY – SUMMARY

5.3.1 Vertebrate Fauna

Table 3 summarises the number of vertebrate fauna species potentially occurring within or utilising at times the 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 3: Summary of Potential Vertebrate Fauna Species (as listed in Appendix B)

Group	Total number of Potential 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 recorded during field survey
Amphibians	3	0	0	0	0
Reptiles	36	0	0	1	1
Birds	95 ³	4	0	1	21
Non-Volant Mammals	20 ⁶	3	0	2	3
Volant Mammals (Bats)	9	0	0	1	0
Total	163⁹	7	0	5	25

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, most 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 extinction.

Table 4 below listed those species previously recorded or considered potentially present in the wider area along with an assessment of their likelihood of occurrence within the subject site itself.

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

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments
	BC Act/ DBCA Priority	EPBC Act				
Swan Coastal Plain Shield-backed Trapdoor Spider <i>Idiosoma sigillatum</i>	P3	-	Burrows of this species usually found in banksia woodland and heathland on sandy soils.	No/Marginal	Unlikely to Occur.	Habitat appears unsuitable.
Western Pygmy Trapdoor Spider <i>Bertmainius opimus</i>	P3	-	Poorly documented - Lives in shallow burrows on eucalyptus bark or in topsoil.	?	Possibly occurs	Previously recorded in nearby state forest (DBCA 2019).
Vasse Pachysaga (cricket) <i>Pachysaga strobila</i>	P1	-	Not documented.	?	Unlikely to Occur	Given the lack of published records and apparent knowledge on this species, its status within the subject site is difficult to determine, however the probability of it being present can be regarded as being extremely low
Carter's Freshwater Mussel <i>Westralunio carteri</i>	S3	VU	Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots.	No	Would Not Occur.	No suitable habitat.
Pouched Lamprey <i>Geotria australis</i>	S3	VU	This species lives in mud burrows in the upper reaches of coastal streams for the first 4 years of life until migrating to the sea. Adults migrate up to 60km upstream during spawning.	No	Would Not Occur.	No suitable habitat.
Coastal Plains Skink <i>Ctenotus ora</i>	P3	-	Sandy substrates with low vegetation (including heath) in open <i>Eucalyptus/Corymbia</i> woodland over <i>Banksia</i> .	Yes	Possibly occurs	Previously recorded at several locations along the Whicher Scarp (See Appendix B).
Blue-billed Duck <i>Oxyura australis</i>	P4	-	Well vegetated freshwater swamps, large dams and lakes, winters on more open water. Occasionally salt lakes and estuaries freshened by floodwaters.	No	Would Not Occur.	No suitable habitat.
Migratory Shorebirds/Wetland Species/Marine Species (various reptiles, birds and mammals)	S5, Various	Ma, Mig, Various	Varies between species but includes open ocean, 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.	No	Would Not Occur.	No suitable habitat.
Eastern Osprey <i>Pandion haliaetus</i>	S5	Ma, Mig	Coasts, estuaries, bays, inlets, islands, and surrounding waters, coral atolls, reefs, lagoons, rock cliffs and stacks. Ascends larger rivers.	No	Would Not Occur.	May very occasionally fly along the nearby Preston River

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments
	BC Act/ DBCA Priority	EPBC Act				
Peregrine Falcon <i>Falco peregrinus</i>	S7	-	Diverse from rainforest to arid shrublands, from coastal heath to alpine Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes.	Yes	Possibly Occurs.	Uncommon but the subject site may represent part of a larger home range used by individuals of this species.
Masked Owl (SW population) <i>Tyto n. novaehollandiae</i>	P3	-	Roosts and nests in heavy forest, hunts over open woodlands and farmlands.	Yes	Possibly Occurs.	Uncommon but may occur, if only occasionally.
Barking Owl (SW population) <i>Ninox connivens connivens</i>	P2	-	Dense vegetation, especially forest and thickets of waterside vegetation such as <i>melaleucas</i> . Roosts in tree hollows.	No	Would Not Occur.	Habitat appears unsuitable and rarely recorded in his part of the south west.
Australasian Bittern <i>Botaurus poiciloptilus</i>	S1	EN	Freshwater wetlands, occasionally estuarine; prefers heavy vegetation such as beds of tall dense <i>Typha</i> , <i>Baumea</i> and sedges in freshwater swamps.	No	Would Not Occur.	No suitable habitat.
Black Bittern <i>Ixobrychus flavicollis</i>	P1	-	Freshwater pools, swamps and lagoons well screened with trees. Shelters in dense waterside vegetation.	No	Would Not Occur.	No suitable habitat.
Little Bittern <i>Ixobrychus minutus</i>	P4	-	Dense vegetation surrounding/within freshwater pools, swamps and lagoons, well screened with trees. Shelters in dense beds of <i>Typha</i> , <i>Baumea</i> and tall rushes in freshwater swamps around lakes and along rivers.	No	Would Not Occur.	No suitable habitat.
Carnaby's Black Cockatoo <i>Calyptorhynchus latirostris</i>	S2	EN	Forests, woodlands, heathlands, farms; feeds on <i>Banksia</i> , <i>Hakea</i> and Marri.	Yes	Possibly Occurs.	Subject site contains areas of foraging habitat and potential breeding habitat.
Baudin's Black Cockatoo <i>Calyptorhynchus baudinii</i>	S2	EN	Mainly eucalypt forests where it feeds primarily on the marri seeds.	Yes	Known to Occur	Subject site contains areas of foraging habitat and potential breeding habitat.
Forest Red-tailed Black Cockatoo <i>Calyptorhynchus banksii naso</i>	S3	VU	Eucalypt forests, feeds on marri, jarrah, blackbutt, karri, sheoak and snottygobble.	Yes	Known to Occur	Subject site contains areas of foraging habitat and potential breeding habitat.
Fork-tailed Swift <i>Apus pacificus</i>	S5	Ma, Mig	Low to very high airspace over varied habitat from rainforest to semi desert.	Yes	Unlikely to Occur, Flyover only on very rare occasions.	May occur very occasionally for brief periods.
Grey Wagtail <i>Motacilla cinerea</i>	S5	Mig, Ma	In Australia, near running water in disused quarries, sandy, rocky streams in escarpments and rainforest, sewerage ponds, ploughed fields and airfields.	No	Would Not Occur.	Never recorded in this area.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments
	BC Act/ DBCA Priority	EPBC Act				
Chuditch <i>Dasyurus geoffroii</i>	S3	VU	Forest, mallee shrublands, woodland and desert. The densest populations have been found in riparian jarrah forest.	Yes	Possibly Occurs.	Recorded during several surveys in nearby areas (see Appendix B).
South-western Brush-tailed Phascogale <i>Phascogale tapoatafa wambenger</i>	S6	-	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover.	Yes	Possibly Occurs.	Recorded during several surveys in nearby areas (see Appendix B).
Quenda <i>Isodon fusciventer</i>	P4	-	Dense scrubby, often swampy, vegetation with dense cover.	Yes/Marginal	Possibly Occurs.	Recorded during several surveys in nearby areas (see Appendix B).
Western Ringtail Possum <i>Pseudocheirus occidentalis</i>	S1	VU	Coastal peppermint, coastal peppermint-tuart, jarrah-marri associations, sheoak woodland, and eucalypt woodland and mallee.	Yes	Known to Occur.	Present, but likely to be in low densities as habitat in some areas is marginal in quality. Recorded during several surveys in nearby areas (see Appendix B).
Quokka <i>Setonix brachyurus</i>	S3	VU	Currently restricted to densely vegetated coastal heaths, swamps, riverine habitats including tea-tree thickets on sandy soils along creek systems.	No	Would Not Occur. Locally extinct.	Locally extinct and habitat unsuitable.
Woylie <i>Bettongia penicillata ogilbyi</i>	S1	EN	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.	Yes/Marginal	Would Not Occur. Locally extinct.	Locally extinct.
Western Brush Wallaby <i>Notamacropus irma</i>	P4	-	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets.	Yes	Possibly Occurs.	Recorded during several surveys in nearby areas (see Appendix B).
Western False Pipistrelle <i>Falsistrellus mackenziei</i>	P4	-	Wet sclerophyll forest dominated by karri and in high rainfall zones of the jarrah and marri forest.	Yes	Possibly Occurs.	Uncommon but recorded during some surveys in nearby areas (see Appendix B).
Water Rat <i>Hydromys chrysogaster</i>	P4	-	Permanent water, fresh, brackish or marine.	No	Would Not Occur.	No suitable habitat.

Note: see Appendix A for conservation codes

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

- Forest Red-tailed Black-Cockatoo *Calyptorhynchus banksii naso* – S3 (*WC Act*), Vulnerable (*EPBC Act*)
Foraging evidence attributed to this species were observed during the survey period (numerous chewed marri fruits). A high percentage of the remnant vegetation within the subject site represents foraging habitat. No evidence of actual breeding taking place was observed however all larger trees ($\geq 50\text{cm}$ DBH) can be considered potential breeding habitat, a number of which appear to contain large hollows. No roosting sites identified though likely to use some trees within the subject site for this purpose.
- Baudin's Black-Cockatoo *Calyptorhynchus baudinii* – S2 (*WC Act*), Vulnerable (*EPBC Act*)
Foraging evidence attributed to this species was observed during the survey period (chewed marri fruits). A high percentage of the remnant vegetation within the subject site represents foraging habitat. No evidence of actual breeding taking place was observed however all larger trees ($\geq 50\text{cm}$ DBH) can be considered potential breeding habitat, a number of which appear to contain large hollows. No roosting sites identified though likely to use some trees within the subject site for this purpose.
- Western Ringtail Possum *Pseudocheirus occidentalis* – S1 (*WC Act*), Critically Endangered (*EPBC Act*)
Evidence of this species was found during the daytime survey in the form of some scats near an unoccupied drey. Overall habitat does however appear marginal due to the sparse nature of the midstorey vegetation and a lack of canopy connectivity. This suggests that this species is only present in low densities.

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

These species are:

- Coastal Plains Skink *Ctenotus ora* – P3 (DBCA Priority Species)
Status of this species within the subject site is difficult to determine without a detailed survey, however, given the location of the subject site within its documented range, some recent nearby records and the presence of habitat that appears suitable it must be assumed to be present. Listed as a potential species based on available information.
- Carnaby's Black-Cockatoo *Calyptorhynchus latirostris* – S2 (*WC Act*), Endangered (*EPBC Act*)
This species is known to frequent the general area and as suitable habitat is present it must be assumed to occur. A high percentage of the remnant vegetation within the

subject site represents foraging habitat. No evidence of actual breeding taking place was observed however all larger trees (≥ 50 cm DBH) can be considered potential breeding habitat, a number of which appear to contain large hollows. No roosting sites identified though likely to use some trees within the subject site for this purpose. Listed as a potential species based on available information.

- Peregrine Falcon *Falco peregrinus* – S7 (WC Act)
This species potentially utilises some sections of the subject site as part of a much larger home range though only likely to occur infrequently. No evidence of nesting seen. Listed as a potential species based on available information.
- Masked Owl *Tyto novaehollandiae* – P3 (DBCAs Priority Species)
Status in the general area is difficult to determine. May utilise woodland areas within and near the subject site for roosting and therefore may forage in more open areas. Probably only present rarely. Listed as a potential species based on available information.
- South-western Brush-tailed Phascogale *Phascogale tapoatafa wambenger* – S6 (WC Act)
Recorded during previous surveys in the general area (Bancroft and Bamford 2008, Harewood 2014, G. Harewood pers. obs. 2013) and likely to be present in woodland areas containing tree hollows. Listed as a potential species based on available information.
- Chuditch *Dasyurus geoffroyi* - S3 (WC Act), Vulnerable (EPBC Act)
Without a detailed survey the status of this species within the subject site is difficult to determine however given there are some nearby records (Bancroft and Bamford 2008, G. Harewood pers. obs. 2013) it must be considered a potential species. Listed as a potential species based on available information.
- Quenda *Isoodon fusciventer* – P4 (DBCAs Priority Species)
Habitat is general marginal for this species give the sparse nature of groundcover but it may occur in some areas where the densest vegetation occurs. Listed as a potential species based on available information.
- Western Brush Wallaby *Macropus irma* - P4 (DBCAs Priority Species)
This species is known to occur in the general area (G. Harewood pers. obs. 2016). As habitat appears suitable it must be assumed to occur, if only occasionally. Listed as a potential species based on available information.
- Western False Pipistrelle *Falsistrellus mackenziei* – P4 (DBCAs Priority Species)
There is a lack of records of this species in the immediate vicinity but given habitat appears at least marginally suitable it must be assumed to occur, if only occasionally. Listed as a potential species based on available information.

As listed in Table 4, a number of other species of conservation significance, while possibly present in the wider area are not considered as potential species due to known localised

extinction (and no subsequent recruitment from adjoining areas), lack of suitable habitat and/or the presence of feral predators.

5.3.3 Invertebrate Fauna of Conservation Significance

Four conservation significant invertebrate species appeared in the DBCA database search (DBCA 2019), these being an unnamed cricket (*Pachysaga strobila*), the Swan Coastal Plain shield-backed trapdoor spider (*Idiosoma sigillatum*), the western pygmy trapdoor spider (*Bertmainius opimus*) and Carter’s freshwater mussel (*Westralunio carteri*).

Both the Swan Coastal Plain shield-backed trapdoor spider and Carter’s freshwater mussel have been assessed as not occurring due to a lack of suitable habitat. *Pachysaga strobila* is also considered as unlikely to occur though it is difficult to totally discount its possible presence.

The western pygmy trapdoor spider has been collected in a state forest near the subject site (DBCA 2019) so it must be regarded as a potential species though its actual status within the subject site is unknown.

6. 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 black cockatoo habitat was also carried out.

With respect to native vertebrate fauna, 29 mammals (includes nine bat species), 92 bird, 36 reptile and three 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, a conclusion largely based on the presence of apparently suitable habitat. Overall fauna habitat quality appears to be good and it can be expected that a high percentage of the predicted species would utilise the subject site.

The assessment identified the presence of “potential” black cockatoo breeding and foraging habitat within the subject site and the presence of the western ringtail possum. A number of additional federal and/or state listed threatened and DBCA priority fauna species may also occur though in most cases their use of the subject site wasn’t detected during the survey period.

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

- forest red-tailed black cockatoo – Vulnerable (WA/Federal);
- Baudin’s black cockatoo – Endangered (WA/Federal); and

- western ringtail possum – Critically Endangered (WA/Federal).

An additional nine species of conservation significance may also utilise the subject site, though, as no evidence of these species presence was identified during the field survey, the status of some in the area remains uncertain. These species are:

- coastal plains skink – P3 (DBCA Priority Species);
- masked owl – P3 (DBCA Priority Species);
- south-western brush-tailed phascogale - S6 (WC Act);
- Carnaby's cockatoo – Endangered (WA/Federal);
- peregrine falcon – Schedule 7 (WA);
- quenda – Priority 4 (WA);
- western brush wallaby - Priority 4 (WA); and
- western false pipistrelle – P4 (DBCA Priority Species).

One invertebrate species of conservation significance has also been assessed as possibly occurring based on available information. The western pygmy trapdoor spider (Priority 3) has been collected in a state forest near the subject site (DBCA 2019) so it must be regarded as a potential species though its actual status within the subject site is unknown.

The exact location of proposed development within the subject site is yet to be finalise. Ongoing planning will need to take into account the potential presence of habitat used by some species of conservation significance and fauna in general so that any direct and indirect impacts can be avoided or minimised. Management plans and protocols that aim to minimise impact on fauna and fauna habitat should be employed if considered warranted.

7. REFERENCES

- Anstis, M. (2013). Tadpoles and Frogs of Australia. New Holland Publishers, Sydney.
- 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.
- Bancroft, W. and Bamford, M. (2008). Fauna values of Bemax's Happy Valley mineral sands deposit. Unpublished report for Bemax Resources Limited. January 2008.
- Barrett, G., Silcocks, A., Barry, S., Cunningham, R. and Poulter, R. (2003). The New Atlas of Australian Birds. Royal Australasian Ornithologists Union, Victoria.
- Biologic (2014). Wonnerup North Vertebrate Fauna Assessment. Unpublished report for Cristal Mining Australia Ltd.
- 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.
- 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.
- Commonwealth of Australia (2012). EPBC Act Referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered) *Calyptorhynchus latirostris*, Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii*, Forest red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksii naso*.
- Christidis, L. and Boles, W.E. (2008). Systematics and Taxonomy of Australian Birds. CSIRO Publishing, Melbourne.
- Daniel March Botanical Consulting (DMBC) (2019). Desktop Study and Reconnaissance Flora and Vegetation Survey. – Lot 287 South West Hwy, Gwindinup WA. Unpublished report for Mario Michele Giacci.

Dell, J. (2000). A draft summary assessment of the fauna values of the Kemerton Bushland. Unpublished report for the Conservation Branch, Policy Division, Department of Environmental Protection.

Department of Biodiversity, Conservation and Attractions (DBCA) (2018). Threatened and Priority Fauna Rankings. 11 September 2018.

Department of Biodiversity Conservation and Attractions (DBCA) (2019). NatureMap Database search. "By Circle" 115° 44' 28" E, 33° 31' 06" S (plus 20 km buffer). <http://naturemap.dec.wa.gov.au>. Accessed 8 March 2019.

Department of the Environment and Energy (DotEE) (2018). *EPBC Act Protected Matters Report: Point Search -33.51841 115.74103 (1km Buffer)* Available from: <http://www.environment.gov.au>. Accessed 8 March 2019.

Environmental Protection Authority (EPA) (2009). Environmental Protection Bulletin No. 6, The Natural Values of the Whicher Scarp. August 2009.

EPA (2016). Technical Guidance – Terrestrial Vertebrate Fauna Surveys (replaces EPA (2004). Guidance for the Assessment of Environmental Factors No 56: Terrestrial Surveys for Environmental Impact Assessment, but not yet updated).

Government of Western Australia (2018). Wildlife Conservation Act 1950. Wildlife Conservation (Specially Protected Fauna) Notice 2017. Government Gazette, WA. 11 September 2018.

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.

Harewood, G. (2017). Fauna Assessment of Lot 3833 (Part) Hyder Road – Yoganup Extended. Unpublished report for Iluka Resources Ltd.

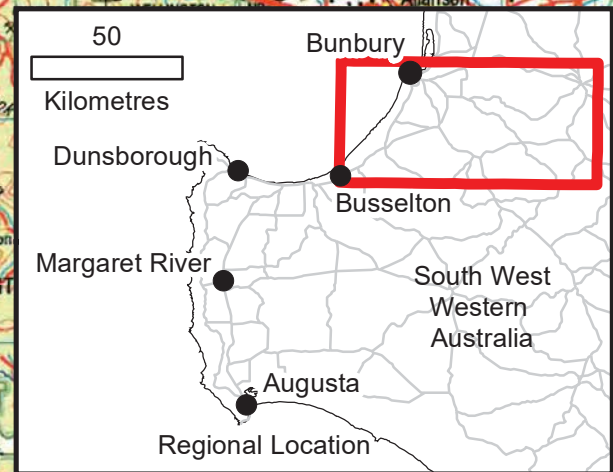
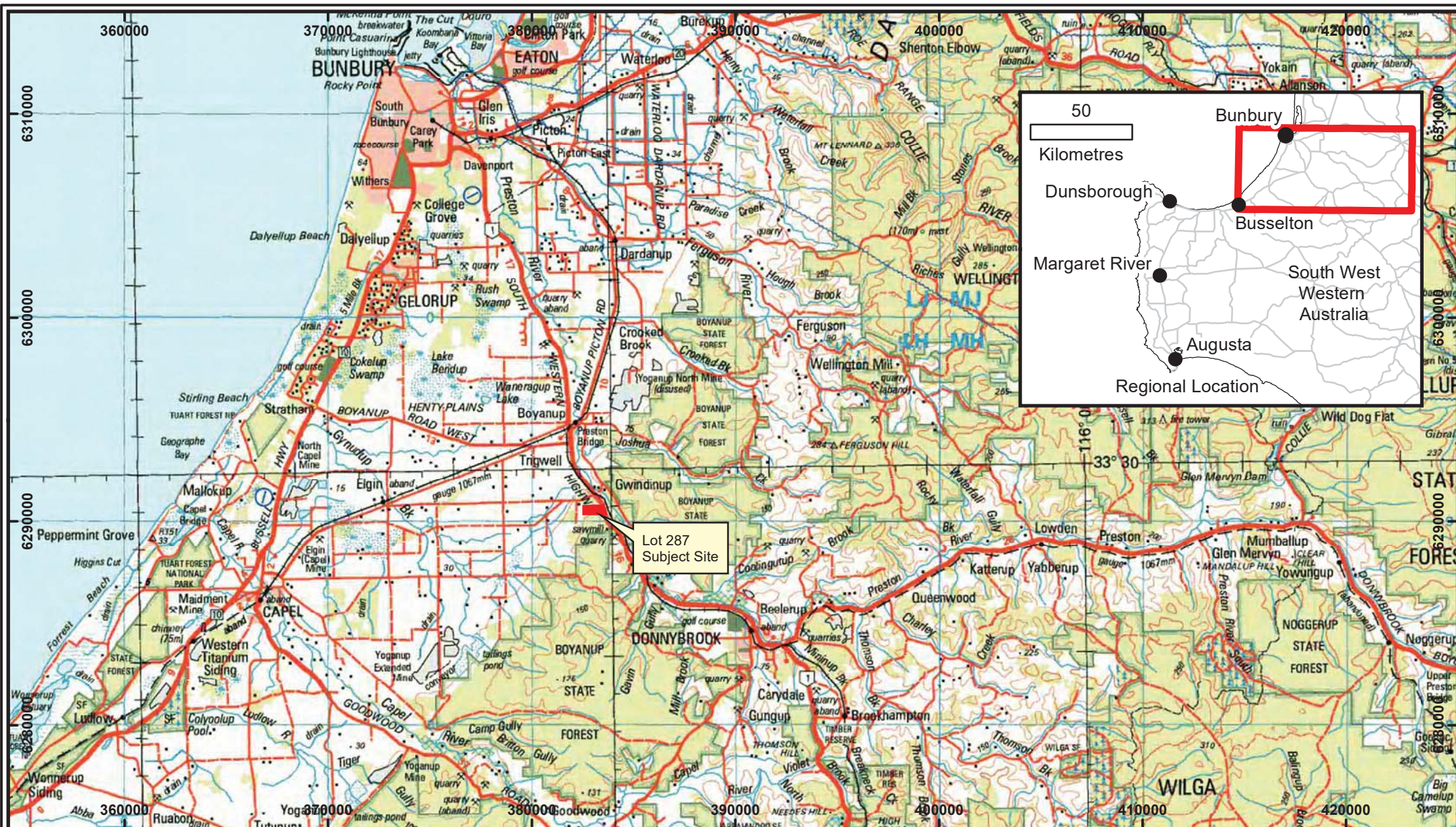
Harewood, G. (2018). Western Ringtail Possum 2018 Monitoring Survey, Gwindinup North Mineral Sands Mine, June/July 2018. Unpublished report for Cristal Mining Australia Limited. September 2016.

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

Harvey, M. S. (2002). Short-range endemism among the Australian fauna: some examples from non-marine environments. *Invertebrate Systematics* 16: 555-570.

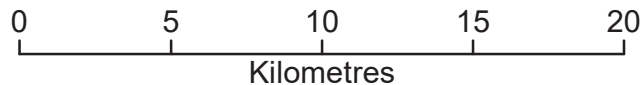
- Johnstone, R.E. and Storr, G.M. (1998). Handbook of Western Australian Birds: Volume 1 – Non-passerines (Emu to Dollarbird). Western Australian Museum, Perth Western Australia.
- Johnstone, R.E. and Storr, G.M. (2004). Handbook of Western Australian Birds: Volume 2 – Passerines (Blue-winged Pitta to 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.
- Ninox (2006). A Vertebrate Fauna Assessment of the Yoganup Mineral Sands Project Area. Unpublished report for Iluka Resources. March 2006.
- Peck, A., Barrett, G. & Williams, M. (2018). *The 2018 Great Cocky Count: a community-based survey for Carnaby's Black-Cockatoo (Calyptorhynchus latirostris), Baudin's Black-Cockatoo (Calyptorhynchus baudinii) and Forest Red-tailed Black-Cockatoo (Calyptorhynchus banksii naso)*. BirdLife Australia, Floreat, Western Australia.
- 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.

FIGURES



Legend

 Subject Site



Fauna Survey

Drawn: G Harewood

Date: Mar 2019

Scale: 1:250,000

Projection/Coordinate System: UTM/MGA Zone 50


Lot 287 SW Highway
Gwindinup

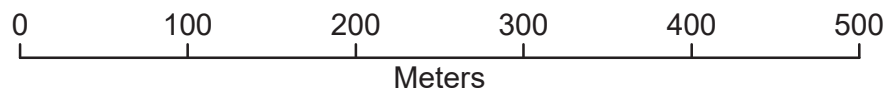
**Subject Site
and Surrounds**

Figure: 1



Legend

 Subject Site



Drawn: G Harewood
Date: Mar 2019
Scale: 1:4,500



Projection/Coordinate System: UTM/MGA Zone 50

Lot 287 SW Highway
Gwindinup
**Subject Site
Aerial Photograph**





Figure: 2



Legend

-  Lot 287 Boundary
-  Vegetation survey area

Vegetation type

-  VT1: Tall woodland of *Eucalyptus marginata* and *Corymbia calophylla* over low woodland of *Banksia grandis* over tall sparse shrubland of *Kunzea glabrescens* over low sparse shrubland of *Xanthorrhoea preissii*.
-  VT2: Tall woodland of *Eucalyptus marginata* and *Corymbia calophylla* over tall sparse shrubland of *Kunzea glabrescens* over low sparse shrubland of *Xanthorrhoea preissii* and *Xanthorrhoea gracilis*.
-  VT3: Tall woodland of *Eucalyptus marginata* and *Corymbia calophylla* over low sparse shrubland of *Xanthorrhoea preissii* and *Hibbertia hypericoides*.
-  Disturbed: Bluegum plantations, tracks and clearings.

Scale: 1:6500
 Original Size: A4
 Air Photo Date: February 2017
 Grid: MGA94(50)



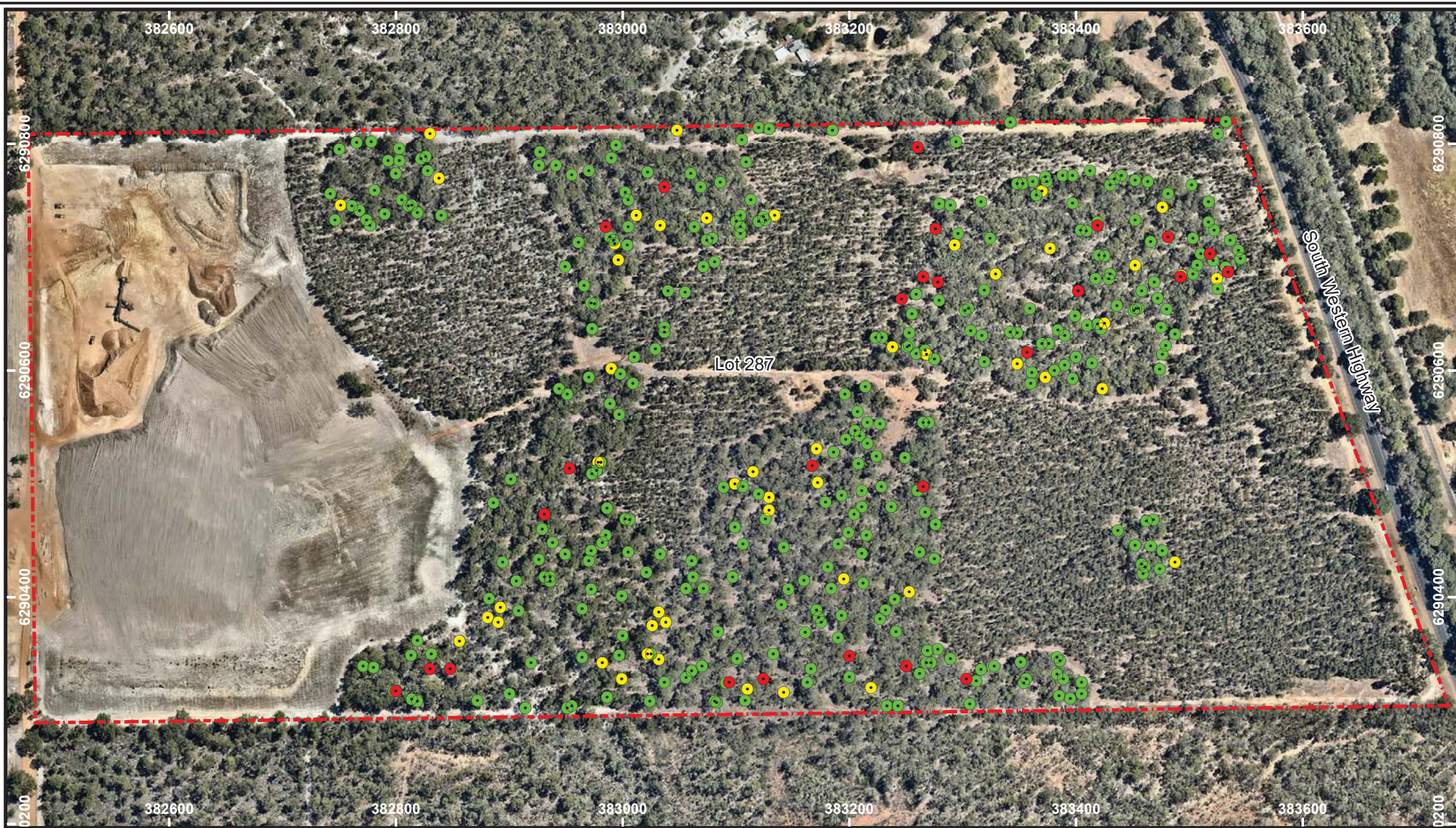
Mario Michele Giacci
 Lot 287 South Western Hwy, Gwindinup
 Flora and Vegetation Survey

Figure 3


Vegetation Units (Courtesy DMBC 2019)




4 Cook St
 West Perth WA 6005
 Ph: (08) 9226 3166
 Fax: (08) 9226 3177
 info@mbsenvironmental.com.au
 www.mbsenvironmental.com.au

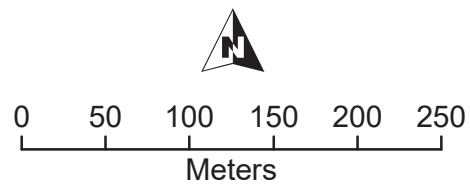




Legend

 Subject Site

-  Habitat Tree - One or more 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: Mar 2019
Scale: 1:4,500

Projection/Coordinate System: UTM/MGA Zone 50

Lot 287 SW Highway
Gwindinup

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

APPENDIX A

CONSERVATION CATEGORIES

EPBC Act (1999) Threatened Fauna Categories

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

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

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

Wildlife Conservation (Specially Protected Fauna) Notice 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.

Category	Code	Description
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

Lot 287 SW Highway.

Approx. centroid = 115.74103°E, 33.51841°S

Compiled by Greg Harewood - March 2019

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

A = Harewood, G (2019). Fauna Assessment Lot 287 South Western Highway. Unpublished report for M.Giacchi. March 2019.

B = Harewood, G (2016). Fauna Assessment Lot 3833 (Part) Hyder Road - Yoganup Extended. Unpublished report for Iluka Resources Limited. December 2016

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

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

E = Bancroft, W. and Bamford, M. (2008). Fauna values of Bemax's Happy Valley mineral sands deposit. Unpublished report for Bemax Resources Limited. January 2008 (includes Gwindinup).

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

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

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

I = Ninox (2006). A Vertebrate Fauna Assessment of the Yoganup Mineral Sands Project Area. Unpublished report for Iluka Resources. March 2006.

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

K = DBCA (2019). NatureMap Database search. "By Circle" 115° 44' 28" E,33° 31' 06" S (plus 20km buffer). 8 March 2019.

Class Family Species	Common Name	Conservation Status											
			A	B	C	D	E	F	G	H	I	J	K

Amphibia

Myobatrachidae

Ground or Burrowing Frogs

<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
<i>Pseudophryne guentheri</i>	Crawling Toadlet	LC							X				X	

Reptilia

Diplodactylidae

<i>Diplodactylus polyopthalmus</i>	Speckled Stone Gecko					X	X	X						X
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WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <https://www.iucnredlist.org/resources/categories-and-criteria>.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J	K
			Gekkonidae Geckoes										
<i>Christinus marmoratus</i>	Marbled Gecko					X	X	X	X	X		X	X
Pygopodidae Legless Lizards													
<i>Aprasia pulchella</i>	Pretty Worm Lizard					X	X		X	X		X	X
<i>Aprasia repens</i>	Sandplain Worm Lizard						X			X		X	
<i>Delma australis</i>	Marble-faced Delma					X							
<i>Lialis burtonis</i>	Burton's Legless Lizard						X	X	X			X	X
<i>Pygopus lepidopus</i>	Common Scaly Foot												
Agamidae Dragon Lizards													
<i>Pogona minor</i>	Western Bearded Dragon					X	X	X	X	X		X	X
Varanidae Monitor's or Goanna's													
<i>Varanus gouldii</i>	Sand Monitor						X						X
<i>Varanus rosenbergi</i>	Heath Monitor					X	X	X		X	X	X	

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <https://www.iucnredlist.org/resources/categories-and-criteria>.

Class Family Species	Common Name	Conservation Status											
			A	B	C	D	E	F	G	H	I	J	K
Scincidae													
Skinks													
<i>Acritoscincus trilineatum</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>Ctenotus impar</i>	Odd-striped Ctenotus					X	X	X	X	X		X	
<i>Ctenotus ora</i>	Coastal Plains Skink	P3				X	X	X	X	X		X	
<i>Egernia kingii</i>	King's Skink					X		X	X			X	
<i>Egernia napoleonis</i>	Salmon-bellied Skink					X	X			X	X	X	
<i>Hemiergis gracilipes</i>	Southwestern Mulch Skink									X		X	
<i>Hemiergis peronii peronii</i>	Four-toed Earless Skink									X			
<i>Hemiergis peronii tridactyla</i>	Three-toed Earless Skink					X	X	X	X			X	
<i>Hemiergis quadrilineata</i>	Two-toed Mulch Skink											X	
<i>Lerista distinguenda</i>	South West Four-toed Lerista					X	X	X	X	X		X	
<i>Lerista elegans</i>	West Coast Four-toed Lerista					X		X	X	X		X	
<i>Menetia greyii</i>	Dwarf Skink					X	X	X	X	X		X	
<i>Morethia lineocellata</i>	West Coast Pale-flecked Morethia					X	X	X	X	X		X	
<i>Morethia obscura</i>	Shrubland Pale-flecked Morethia					X	X	X	X	X		X	

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <https://www.iucnredlist.org/resources/categories-and-criteria>.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J	K
			<i>Tiliqua rugosa</i>	Bobtail			X		X	X	X	X	X
Typhlopidae Blind Snakes													
<i>Ramphotyphlops australis</i>	Southern Blind Snake					X	X	X	X	X		X	
<i>Ramphotyphlops pinguis</i>	Fat Blind Snake					X	X			X			
Boidae Pythons, Boas													
<i>Morelia spilota imbricata</i>	Southern Carpet Python						X						
Elapidae Elapid Snakes													
<i>Echiopsis curta</i>	Bardick												
<i>Elapognathus coronatus</i>	Crowned Snake					X							X
<i>Notechis scutatus</i>	Tiger Snake						X		X			X	X
<i>Parasuta gouldii</i>	Gould's Hooded Snake												
<i>Parasuta nigriceps</i>	Black-backed Snake					X			X			X	X
<i>Pseudonaja affinis</i>	Dugite					X	X					X	X
<i>Simoselaps bertholdi</i>	Jan's Banded Snake												X

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J	K
			Aves										
Casuariidae Emus, Cassowaries													
<i>Dromaius novaehollandiae</i>	Emu	LC	X	X	X	X	X	X	X	X	X		X
Phasianidae Quails, Pheasants													
<i>Coturnix pectoralis</i>	Stubble Quail	LC			X	X	X						X
<i>Coturnix ypsilophora</i>	Brown Quail	LC							X				
Anatidae 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

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J	K
			Accipitridae 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		X
<i>Aquila audax</i>	Wedge-tailed Eagle	LC				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
<i>Hamirostra isura</i>	Square-tailed Kite	LC					X						
Falconidae Falcons													
<i>Falco berigora</i>	Brown Falcon	LC		X			X						X
<i>Falco cenchroides</i>	Australian Kestrel	LC			X	X	X		X				X
<i>Falco longipennis</i>	Australian Hobby	LC							X				X
<i>Falco peregrinus</i>	Peregrine Falcon	S7 LC					X						X
Turnicidae Button-quails													
<i>Turnix varia</i>	Painted Button-quail	LC					X						

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Class Family Species	Common Name	Conservation Status											
			A	B	C	D	E	F	G	H	I	J	K
Columbidae													
Pigeons, Doves													
<i>Ocyphaps lophotes</i>	Crested Pigeon	LC		X	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
<i>Phaps elegans</i>	Brush Bronzewing	LC											
Psittacidae													
Parrots													
<i>Cacatua sanguinea gymnopsis</i>	Little Corella	Introduced			X								X
<i>Cacatua tenuirostris</i>	Eatern Long-billed Corella	Introduced											
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo	S3 VU	X	X	X	X	X	X	X	X	X	X	X
<i>Calyptorhynchus baudinii</i>	Baudin's Black Cockatoo	S2 EN EN A3cde	X	X	X	X	X	X	X		X	X	X
<i>Calyptorhynchus latirostris</i>	Carnaby's Black Cockatoo	S2 EN EN A2bcde		X	X	X	X	X	X	X		X	X
<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet	LC				X	X			X			
<i>Neophema elegans</i>	Elegant Parrot	LC			X	X	X	X	X	X			X
<i>Platycercus icterotis icterotis</i>	Western Rosella (western ssp)	LC					X	X	X				X
<i>Platycercus spurius</i>	Red-capped Parrot	LC	X	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	X
<i>Polytelis anthopeplus</i>	Regent Parrot	LC								X		X	X

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J	K
			Cuculidae 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	
<i>Cuculus pallidus</i>	Pallid Cuckoo	LC		X				X				X	
Strigidae Hawk Owls													
<i>Ninox novaeseelandiae</i>	Boobook Owl	LC			X	X	X	X					
Tytonidae Barn Owls													
<i>Tyto alba</i>	Barn Owl	LC			X								
<i>Tyto n. novaehollandiae</i>	Masked Owl (SW pop)	P3											X
Podargidae Frogmouths													
<i>Podargus strigoides</i>	Tawny Frogmouth	LC			X		X	X					X
Aegothelidae Owlet-nightjars													
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	LC					X						X

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			Halcyonidae 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
Meropidae Bee-eaters													
<i>Merops ornatus</i>	Rainbow Bee-eater	JA LC	X	X	X	X	X	X	X	X		X	X
Climacteridae Trecreepers													
<i>Climacteris rufa</i>	Rufous Trecreeper	LC						X					
Maluridae Fairy Wrens, GrassWrens													
<i>Malurus elegans</i>	Red-winged Fairy-wren	LC				X	X	X	X	X			X
<i>Malurus splendens</i>	Splendid Fairy-wren	LC		X	X	X	X	X	X	X	X	X	X
<i>Stipiturus malachurus</i>	Southern Emu-wren	LC						X	X				X

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J	K
			Acanthizidae Thornbills, Geryones, Fieldwrens & Whitefaces										
<i>Acanthiza apicalis</i>	Broad-tailed Thornbill	LC	X	X	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	X
<i>Acanthiza inornata</i>	Western Thornbill	LC					X		X	X	X		X
<i>Gerygone fusca</i>	Western Gerygone	LC	X	X	X	X	X	X	X	X	X	X	X
<i>Sericornis frontalis</i>	White-browed Scrubwren	LC				X	X	X	X	X	X		X
<i>Smicrornis brevirostris</i>	Weebill	LC	X	X		X	X	X		X	X		X
Pardalotidae Pardalotes													
<i>Pardalotus punctatus</i>	Spotted Pardalote	LC					X	X	X				X
<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	K	
Meliphagidae Honeyeaters, Chats														
<i>Acanthorhynchus superciliosus</i>	Western Spinebill	LC				X	X	X	X	X	X	X	X	X
<i>Anthochaera carunculata</i>	Red Wattlebird	LC	X	X	X	X	X		X	X	X	X	X	X
<i>Anthochaera lunulata</i>	Western Little Wattlebird	LC		X										X
<i>Epthianura albifrons</i>	White-fronted Chat	LC								X				X
<i>Lichenostomus virescens</i>	Singing Honeyeater	LC							X		X			
<i>Lichmera indistincta</i>	Brown Honeyeater	LC		X	X	X	X	X	X	X	X	X	X	X
<i>Melithreptus chloropsis</i>	Gilbert's Honeyeater	LC						X	X					
<i>Phylidonyris melanops</i>	Tawny-crowned Honeyeater	LC							X	X				
<i>Phylidonyris nigra</i>	White-cheeked Honeyeater	LC								X				
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	LC			X	X	X	X	X	X	X	X	X	X
Petroicidae Australian Robins														
<i>Eopsaltria georgiana</i>	White-breasted Robin	LC						X	X	X				X
<i>Eopsaltria griseogularis</i>	Western Yellow Robin	LC	X			X	X	X	X	X				
<i>Petroica multicolor</i>	Scarlet Robin	LC	X	X		X	X	X	X	X	X			

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Class Family Species	Common Name	Conservation Status												
			A	B	C	D	E	F	G	H	I	J	K	
Neosittidae Sittellas														
<i>Daphoenositta chrysoptera</i>	Varied Sittella	LC	X			X	X	X	X					X
Pachycephalidae Crested Shrike-tit, Crested Bellbird, Shrike Thrushes, Whistlers														
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	LC	X	X		X	X	X	X	X	X	X		X
<i>Pachycephala occidentalis</i>	Western Whistler	LC	X	X	X	X	X	X	X	X	X	X		
<i>Pachycephala rufiventris</i>	Rufous Whistler	LC		X	X	X	X	X	X	X			X	X
Dicruridae Monarchs, Magpie Lark, Flycatchers, Fantails, Drongo														
<i>Grallina cyanoleuca</i>	Magpie-lark	LC			X	X	X		X				X	X
<i>Rhipidura fuliginosa</i>	Grey Fantail	LC	X	X	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
Campephagidae Cuckoo-shrikes, Trillers														
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	LC		X	X	X	X	X	X	X	X	X	X	X
<i>Lalage tricolor</i>	White-winged Triller	LC			X		X							

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J	K
			Artamidae 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			X
Cracticidae Currawongs, Magpies & Butcherbirds													
<i>Cracticus tibicen</i>	Australian Magpie	LC	X	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
<i>Strepera versicolor</i>	Grey Currawong	LC	X			X	X	X					X
Corvidae Ravens, Crows													
<i>Corvus coronoides</i>	Australian Raven	LC	X	X	X	X	X	X	X	X	X	X	X
Motacillidae Old World Pipits, Wagtails													
<i>Anthus australis</i>	Australian Pipit	LC			X	X	X	X	X				
Estrilidae Grass Finches & Mannikins													
<i>Stagonopleura oculata</i>	Red-eared Firetail	LC						X					X
Dicaeidae Flowerpeckers													
<i>Dicaeum hirundinaceum</i>	Mistletoebird	LC											X

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J	K
			Hirundinidae Swallows, Martins										
<i>Hirundo ariel</i>	Fairy Martin	LC			X								
<i>Hirundo neoxena</i>	Welcome Swallow	LC			X	X	X		X	X		X	X
<i>Hirundo nigricans</i>	Tree Martin	LC			X	X	X	X	X		X	X	
Sylviidae Old World Warblers													
<i>Cincloramphus cruralis</i>	Brown Songlark	LC				X							
<i>Cincloramphus mathewsi</i>	Rufous Songlark	LC					X					X	
Zosteropidae White-eyes													
<i>Zosterops lateralis</i>	Grey-breasted White-eye	LC		X	X		X	X	X	X	X	X	X
Mammalia													
Tachyglossidae Echidnas													
<i>Tachyglossus aculeatus</i>	Echidna	LC		X			X	X		X	X		

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Class Family Species	Common Name	Conservation Status												
			A	B	C	D	E	F	G	H	I	J	K	
Dasyuridae Carnivorous Marsupials														
<i>Antechinus flavipes</i>	Yellow-footed Antechinus, Mardo					X	X		X	X				X
<i>Phascogale tapoatafa wambenger</i>	SW Brush-tailed Phascogale	S6				X	X							X
<i>Sminthopsis gilberti</i>	Gilbert's Dunnart	LC					X		X	X				X
<i>Sminthopsis griseoventer</i>	Grey-bellied Dunnart	LC								X	X			
Peramelidae Bandicoots														
<i>Isodon fusciventer</i>	Quenda	P4 LC		X	X	X	X	X	X	X	X		X	X
Phalangeridae Brush-tail Possums, Cuscuses														
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	LC	X	X	X	X	X	X	X	X	X	X	X	
Burramyidae Pygmy Possums														
<i>Cercartetus concinnus</i>	Western Pygmy-possum	LC				X	X	X		X				X
Tarsipedidae Honey Possum														
<i>Tarsipes rostratus</i>	Honey Possum, Noolbenger	LC					X			X			X	
Pseudocheiridae Ringtail Possums														
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	S1 CR CR A2bce+3bce+4bc	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	K	
Macropodidae Kangaroos, Wallabies														
<i>Macropus fuliginosus</i>	Western Grey Kangaroo	LC	X	X	X	X	X	X	X	X	X	X	X	X
<i>Notamacropus irma</i>	Western Brush Wallaby	P4 LC				X	X	X		X				
Molossidae Freetail Bats														
<i>Austronomus australis</i>	White-striped Freetail-bat	LC			X	X	X		X	X				
<i>Ozimops kitcheneri</i>	South-western Freetail-bat	LC				X								
Vespertilionidae 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>Falsistrellus mackenziei</i>	Western False Pipistrelle	P4 NT								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			
<i>Nyctophilus major</i>	Western Long-eared Bat	LC												
<i>Vespadelus regulus</i>	Southern Forest Bat	LC				X	X	X	X	X				X

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			Muridae Rats, Mice										
<i>Mus musculus</i>	House Mouse	Introduced				X	X	X	X			X	X
<i>Rattus fuscipes</i>	Western Bush Rat	LC				X		X	X				
<i>Rattus rattus</i>	Black Rat	Introduced				X	X	X					X
Canidae Dogs, Foxes													
<i>Vulpes vulpes</i>	Red Fox	Introduced			X	X	X	X			X	X	
Felidae Cats													
<i>Felis catus</i>	Cat	Introduced			X			X					
Suidae Pigs													
<i>Sus scrofa</i>	Pig	Introduced		X		X	X						
Leporidae Rabbits, Hares													
<i>Oryctolagus cuniculus</i>	Rabbit	Introduced		X	X	X	X	X	X	X	X	X	X

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APPENDIX C

DBCA & EPBC DATABASE SEARCH RESULTS

NatureMap - Lot 287

Created By Greg Harewood on 08/03/2019

Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 44' 28" E, 33° 31' 06" S
Buffer 20km
Group By Species Group

Species Group	Species	Records
Amphibian	10	134
Bird	156	9038
Fish	7	13
Invertebrate	160	495
Mammal	30	2971
Reptile	31	143
TOTAL	394	12794

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Amphibian				
1.	25398 <i>Crinia georgiana</i> (Quacking Frog)			
2.	25399 <i>Crinia glauerti</i> (Clicking Frog)			
3.	25400 <i>Crinia insignifera</i> (Squelching Froglet)			
4.	25401 <i>Crinia pseudinsignifera</i> (Bleating Froglet)			
5.	25404 <i>Geocrinia leai</i> (Ticking Frog)			
6.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
7.	25411 <i>Heleioporus inornatus</i> (Whooping Frog)			
8.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
9.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
10.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
Bird				
11.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
12.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
13.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
14.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
15.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
16.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
17.	25537 <i>Accipiter novaehollandiae</i> (Grey Goshawk)			
18.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
19.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
20.	25544 <i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
21.	24301 <i>Aegotheles cristatus subsp. cristatus</i> (Australian Owlet-nightjar)			
22.	24310 <i>Anas castanea</i> (Chestnut Teal)			
23.	24312 <i>Anas gracilis</i> (Grey Teal)			
24.	24313 <i>Anas platyrhynchos</i> (Mallard)			
25.	<i>Anas platyrhynchos subsp. domesticus</i>			
26.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
27.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
28.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
29.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
30.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
31.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
32.	41324 <i>Ardea modesta</i> (great egret, white egret)			
33.	24340 <i>Ardea novaehollandiae</i> (White-faced Heron)			
34.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
35.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
36.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
37.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
38.	24318 <i>Aythya australis</i> (Hardhead)			
39.	<i>Barnardius zonarius</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
40.	24319 <i>Biziura lobata</i> (Musk Duck)			
41.	24345 <i>Botaurus poiciloptilus</i> (Australasian Bittern)		□	
42.	25714 <i>Cacatua pastinator</i> (Western Long-billed Corella)			
43.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
44.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
45.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
46.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
47.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black Cockatoo)		□	
48.	24733 <i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)		□	
49.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)		□	
50.	48400 <i>Calyptorhynchus</i> sp. (white-tailed black cockatoo)		□	
51.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
52.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
53.	<i>Chroicocephalus novaehollandiae</i>			
54.	<i>Circus aeruginosus</i>			Y
55.	24288 <i>Circus approximans</i> (Swamp Harrier)			
56.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
57.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
58.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
59.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
60.	25592 <i>Corvus coronoides</i> (Australian Raven)			
61.	24417 <i>Corvus coronoides</i> subsp. <i>perplexus</i> (Australian Raven)			
62.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			
63.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
64.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
65.	<i>Cracticus torquatus</i>			
66.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
67.	24322 <i>Cygnus atratus</i> (Black Swan)			
68.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
69.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
70.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
71.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
72.	<i>Egretta garzetta</i>			
73.	<i>Egretta novaehollandiae</i>			
74.	<i>Elanus axillaris</i>			
75.	47937 <i>Elseyornis melanops</i> (Black-fronted Dotterel)			
76.	<i>Eolophus roseicapillus</i>			
77.	24652 <i>Eopsaltria georgiana</i> (White-breasted Robin)			
78.	24567 <i>Epthianura albifrons</i> (White-fronted Chat)			
79.	25621 <i>Falco berigora</i> (Brown Falcon)			
80.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
81.	25623 <i>Falco longipennis</i> (Australian Hobby)			
82.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
83.	24616 <i>Falculculus frontatus</i> subsp. <i>leucogaster</i> (Western Shrike-tit, Crested Shrike-tit)			
84.	25727 <i>Fulica atra</i> (Eurasian Coot)			
85.	24761 <i>Fulica atra</i> subsp. <i>australis</i> (Eurasian Coot)			
86.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
87.	24763 <i>Gallinula tenebrosa</i> subsp. <i>tenebrosa</i> (Dusky Moorhen)			
88.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			
89.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
90.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
91.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
92.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
93.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
94.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
95.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
96.	24511 <i>Larus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Silver Gull)			
97.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
98.	<i>Lophoictinia isura</i>			
99.	24690 <i>Macronectes giganteus</i> (Southern Giant Petrel)		IA	
100.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
101.	25650 <i>Malurus elegans</i> (Red-winged Fairy-wren)			
102.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
103.	25758 <i>Megalurus gramineus</i> (Little Grassbird)			
104.	47997 <i>Melanodryas cucullata</i> (Hooded Robin)			
105.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
106.	<i>Microcarbo melanoleucos</i>			
107.	25610 <i>Myiagra inquieta</i> (Restless Flycatcher)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
108.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
109.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
110.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
111.	24328 <i>Oxyura australis</i> (Blue-billed Duck)		P4	
112.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
113.	24692 <i>Pachyptila belcheri</i> (Slender-billed Prion)			
114.	24693 <i>Pachyptila desolata</i> (Antarctic Prion)			
115.	48591 <i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
116.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
117.	24626 <i>Pardalotus punctatus</i> subsp. <i>xanthopyge</i> (Yellow-rumped Pardalote)			
118.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
119.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
120.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
121.	48066 <i>Petroica boodang</i> (Scarlet Robin)			
122.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
123.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
124.	25698 <i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
125.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
126.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
127.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
128.	48071 <i>Phylidonyris niger</i> (White-cheeked Honeyeater)			
129.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
130.	24841 <i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
131.	25720 <i>Platycercus icterotis</i> (Western Rosella)			
132.	24745 <i>Platycercus icterotis</i> subsp. <i>icterotis</i> (Western Rosella)			
133.	24747 <i>Platycercus spurius</i> (Red-capped Parrot)			
134.	24750 <i>Platycercus zonarius</i> subsp. <i>semitorquatus</i> (Twenty-eight Parrot)			
135.	24843 <i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
136.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
137.	24679 <i>Podargus strigoides</i> subsp. <i>brachypterus</i> (Tawny Frogmouth)			
138.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
139.	24681 <i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
140.	25722 <i>Polytelis anthopeplus</i> (Regent Parrot)			
141.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
142.	24767 <i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)			
143.	24703 <i>Pterodroma lessonii</i> (White-headed Petrel)			
144.	<i>Purpureicephalus spurius</i>			
145.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
146.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
147.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
148.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
149.	30948 <i>Smicromis brevirostris</i> (Weebill)			
150.	24645 <i>Stagonopleura oculata</i> (Red-eared Firetail)			
151.	24329 <i>Stictonetta naevosa</i> (Freckled Duck)			
152.	25655 <i>Stipiturus malachurus</i> (Southern Emu-wren)			
153.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
154.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
155.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
156.	24682 <i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
157.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
158.	34134 <i>Thalassarche carteri</i> (Indian Yellow-nosed Albatross)		□	
159.	48597 <i>Thalasseus bergii</i> (Crested Tern)		IA	
160.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
161.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
162.	24808 <i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	
163.	48147 <i>Turnix varius</i> (Painted Button-quail)			
164.	24855 <i>Tyto novaehollandiae</i> subsp. <i>novaehollandiae</i> (Masked Owl (southwest))		P3	
165.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
166.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			
ish				
167.	<i>Bostockia porosa</i>			
168.	<i>Carassius auratus</i>			
169.	<i>Echeneis naucrates</i>			
170.	<i>Edelia vittata</i>			
171.	34028 <i>Galaxias occidentalis</i> (Western Minnow)			
172.	34030 <i>Geotria australis</i> (Pouched Lamprey)		P3	
173.	<i>Nannoperca vittata</i>			

Invertebrate

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
174.	<i>Acariformes</i> sp.			
175.	<i>Aganippe raphiduca</i>			
176.	<i>Akamptogonus novarae</i>			
177.	<i>Allothereua maculata</i>			
178.	<i>Aname mainae</i>			
179.	<i>Aname tepperi</i>			
180.	<i>Ancyliidae</i> sp.			
181.	<i>Anisops</i> sp.			
182.	<i>Antichiropus nanus</i>			
183.	<i>Antiporus occidentalis</i>			
184.	<i>Antiporus</i> sp.			
185.	<i>Arachnura higginsi</i>			
186.	<i>Araneus cyphoxis</i>			
187.	<i>Araneus senicaudatus</i>			
188.	<i>Argiope protensa</i>			
189.	<i>Arkys alticephala</i>			
190.	<i>Arkys walckenaeri</i>			
191.	<i>Arrenuridae</i> sp.			
192.	<i>Artonia flavimana</i>			
193.	<i>Artoriopsis exposita</i>			
194.	<i>Athericidae</i> sp.			
195.	<i>Aturidae</i> sp.			
196.	<i>Austracantha minax</i>			
197.	<i>Backobourkia brounii</i>			
198.	<i>Badumna insignis</i>			
199.	<i>Baetidae</i> sp.			
200.	<i>Baiami tegenarioides</i>			
201.	<i>Baiami volucripes</i>			
202.	<i>Berosus discolor</i>			
203.	<i>Berosus munitipennis</i>			
204.	47873 <i>Bertmainius opimus</i> (western pygmy trapdoor spider)		P3	
205.	<i>Botryocladus freemani</i>			
206.	<i>Caenidae</i> sp.			
207.	<i>Carabidae</i> sp.			
208.	<i>Ceinidae</i> sp.			
209.	<i>Celaenia excavata</i>			
210.	<i>Ceratopogonidae</i> sp.			
211.	<i>Cercophonius sulcatus</i>			
212.	<i>Cherax preissii</i>			
213.	<i>Cherax quinquecarinatus</i>			
214.	<i>Chironominae</i> sp.			
215.	<i>Chironomus</i> aff. <i>alternans</i> (V24) (CB)			
216.	<i>Chironomus tepperi</i>			
217.	<i>Clynotis severus</i>			
218.	<i>Coenagrionidae</i> sp.			
219.	<i>Copepoda</i> sp.			
220.	<i>Corixidae</i> sp.			
221.	<i>Cormocephalus hartmeyer</i>			
222.	<i>Corynoneura</i> sp. (V49) (SAP)			
223.	<i>Cricotopus 'parbicinctus'</i>			
224.	<i>Cryptoerithus quobba</i>			
225.	<i>Culex</i> (<i>Culex</i>) <i>australicus</i>			
226.	<i>Culicidae</i> sp.			
227.	<i>Cyclosa trilobata</i>			
228.	<i>Dicrotendipes</i> sp. A (V47) (SAP)			
229.	<i>Dingosa serrata</i>			
230.	<i>Dugesiiidae</i> sp.			
231.	<i>Dytiscidae</i> sp.			
232.	<i>Ecnomidae</i> sp.			
233.	<i>Erigone prominens</i>			
234.	<i>Eriophora biapicata</i>			
235.	<i>Gomphidae</i> sp.			
236.	<i>Gripopterygidae</i> sp.			
237.	<i>Gyrinidae</i> sp.			
238.	<i>Harrisius</i> sp.			
239.	<i>Harrisius</i> sp. B (SFM)			
240.	<i>Helochares tenuistriatus</i>			
241.	<i>Helpis minitabunda</i>			
242.	<i>Hemicorduliidae</i> sp.			
243.	<i>Hydrobiosidae</i> sp.			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
244.	<i>Hydrophilidae</i> sp.			
245.	<i>Hydropsychidae</i> sp.			
246.	<i>Hydroptilidae</i> sp.			
247.	<i>Hyriidae</i> sp.			
248.	48935 <i>Idiosoma sigillatum</i> (Swan Coastal Plain shield-backed trapdoor spider)		P3	
249.	<i>Insulodrilus bifidus</i>			
250.	<i>Isopeda leishmanni</i>			
251.	<i>Isopedella cana</i>			
252.	<i>Isopedella castanea</i>			
253.	<i>Kiefferulus intertinctus</i>			
254.	<i>Lampona brevipes</i>			
255.	<i>Lampona cylindrata</i>			
256.	<i>Lampona punctigera</i>			
257.	<i>Lancetes lanceolatus</i>			
258.	<i>Latrodectus hasseltii</i>			
259.	<i>Leptoceridae</i> sp.			
260.	<i>Leptoperla australica</i>			
261.	<i>Leptophlebiid</i> genus S sp. AV1			
262.	<i>Leptophlebiidae</i> sp.			
263.	<i>Lestidae</i> sp.			
264.	<i>Libellulidae</i> sp.			
265.	<i>Limbodessus inornatus</i>			
266.	<i>Limnophyes vestitus</i> (V41)			
267.	<i>Limnoxenus zelandicus</i>			
268.	<i>Maratus pavonis</i>			
269.	<i>Megapodagrionidae</i> sp.			
270.	<i>Micronecta robusta</i>			
271.	<i>Microvelia</i> sp.			
272.	<i>Missulena granulosa</i>			
273.	<i>Missulena hoggi</i>			
274.	<i>Missulena occatoria</i>			
275.	<i>Mituliodon tarantulinus</i>			
276.	<i>Mitzoruga insularis</i>			
277.	<i>Nephila edulis</i>			
278.	<i>Newmanoperla exigua</i>			
279.	<i>Nicodamus mainae</i>			
280.	<i>Nousia</i> sp. AV16			
281.	<i>Nunciella aspera</i>			
282.	<i>Ocrisiona parmelliae</i>			
283.	<i>Oligochaeta</i> sp.			
284.	<i>Ommatoiulus moreletii</i>			
285.	<i>Opisthopora</i> sp.			
286.	<i>Orthoclaadiinae</i> sp.			
287.	<i>Ostracoda</i> (unident.)			
288.	33989 <i>Pachysaga strobila</i> (Vasse Pachysaga (Busselton-Donnybrook), cricket)		P1	
289.	<i>Palaemonidae</i> sp.			
290.	<i>Paracymus spenceri</i>			
291.	<i>Parakiefferiella variegatus</i>			
292.	<i>Paralimnophyes pullulus</i> (V42)			
293.	<i>Paramelitidae</i> sp.			
294.	<i>Paramerina levidensis</i>			
295.	<i>Parastacidae</i> sp.			
296.	<i>Pentaneurini</i> genus V20			
297.	<i>Pertiidae</i> sp.			
298.	<i>Philopotamidae</i> sp.			
299.	<i>Pholcus phalangioides</i>			
300.	<i>Phreatoicidae</i> sp.			
301.	<i>Phreodrilidae</i> sp.			
302.	<i>Planorbidae</i> sp.			
303.	<i>Platorish gelorup</i>			
304.	<i>Platynectes decempunctatus</i> var <i>polygrammus</i>			
305.	<i>Platynectes</i> sp.			
306.	<i>Polypedium</i> nr. <i>convexum</i> (SAP)			
307.	<i>Polypedium watsoni</i>			
308.	<i>Pyralidae</i> sp.			
309.	<i>Rhantus suturalis</i>			
310.	<i>Riethia</i> v5			
311.	<i>Scirtidae</i> sp.			
312.	<i>Scutigera indecisa</i>			
313.	<i>Simuliidae</i> sp.			

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314.	<i>Staphylinidae</i> sp.			
315.	<i>Sternopriscus browni</i>			
316.	<i>Sternopriscus</i> sp.			
317.	<i>Tabanidae</i> sp.			
318.	<i>Tamopsis distinguenda</i>			
319.	<i>Tanypodinae</i> sp.			
320.	<i>Tanytarsus</i> nr K5			
321.	<i>Tanytarsus palmatus</i>			
322.	<i>Tasmanicosa leuckartii</i>			
323.	<i>Telephlebiidae</i> sp.			
324.	<i>Tetragnatha demissa</i>			
325.	<i>Tipulidae</i> sp.			
326.	<i>Triplectides</i> sp. AV21 (SFM)			
327.	<i>Urodacus novaehollandiae</i>			
328.	<i>Uvarus pictipes</i>			
329.	<i>Veliidae</i> sp.			
330.	<i>Venator immansueta</i>			
331.	<i>Venatrix pullastra</i>			
332.	34113 <i>Westralunio carteri</i> (Carter's Freshwater Mussel)		□	
333.	<i>Zachria flavicoma</i>			

Mammal

334.	24088 <i>Antechinus flavipes</i> subsp. <i>leucogaster</i> (Yellow-footed Antechinus, Mardo)			
335.	24162 <i>Bettongia penicillata</i> subsp. <i>ogilbyi</i> (Woylie, Brush-tailed Bettong)		□	
336.	24251 <i>Bos taurus</i> (European Cattle)	Y		
337.	24072 <i>Caperea marginata</i> (Pygmy Right Whale)			
338.	24086 <i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)			
339.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattled Bat)			
340.	24187 <i>Chalinolobus morio</i> (Chocolate Wattled Bat)			
341.	24092 <i>Dasyurus geoffroyi</i> (Chuditch, Western Quoll)		□	
342.	24043 <i>Eubalaena australis</i> (Southern Right Whale)		□	
343.	24189 <i>Falsistrellus mackenziei</i> (Western False Pipistrelle, Western Falsistrelle)		P4	
344.	24056 <i>Grampus griseus</i> (Risso's Dolphin)			
345.	24215 <i>Hydromys chrysogaster</i> (Water-rat, Rakali)		P4	
346.	48588 <i>Isoodon fusciventer</i> (Quenda, southwestern brown bandicoot)		P4	
347.	24132 <i>Macropus fuliginosus</i> (Western Grey Kangaroo)			
348.	24076 <i>Mesoplodon bowdoini</i> (Andrew's Beaked Whale)			
349.	24078 <i>Mesoplodon grayi</i> (Gray's Beaked Whale)			
350.	24213 <i>Mirounga leonina</i> (Southern Elephant Seal)			
351.	24223 <i>Mus musculus</i> (House Mouse)	Y		
352.	48022 <i>Notamacropus irma</i> (Western Brush Wallaby)		P4	
353.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			
354.	25508 <i>Phascogale tapoatafa</i> (Brush-tailed Phascogale)		S	
355.	48070 <i>Phascogale tapoatafa</i> subsp. <i>wambenger</i> (South-western Brush-tailed Phascogale, Wambenger)		S	
356.	24166 <i>Pseudocheirus occidentalis</i> (Western Ringtail Possum, ngwayir)		□	
357.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
358.	24145 <i>Setonix brachyurus</i> (Quokka)		□	
359.	24111 <i>Sminthopsis gilberti</i> (Gilbert's Dunnart)			
360.	25521 <i>Trichosurus vulpecula</i> (Common Brushtail Possum)			
361.	24158 <i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum)			
362.	30954 <i>Tursiops aduncus</i> (Indo-Pacific Bottlenose Dolphin)			
363.	24206 <i>Vespadelus regulus</i> (Southern Forest Bat)			

Reptile

364.	42368 <i>Acritoscincus trilineatus</i> (Western Three-lined Skink)			
365.	24990 <i>Aprasia pulchella</i> (Granite Worm-lizard)			
366.	25335 <i>Caretta caretta</i> (Loggerhead Turtle)		□	
367.	25336 <i>Chelonia mydas</i> (Green Turtle)		□	
368.	24980 <i>Christinus marmoratus</i> (Marbled Gecko)			
369.	30893 <i>Cryptoblepharus buchananii</i>			
370.	25047 <i>Ctenotus impar</i>			
371.	25049 <i>Ctenotus labillardieri</i>			
372.	41641 <i>Ctenotus ora</i> (Coastal Plains Skink)		P3	
373.	25096 <i>Egernia kingii</i> (King's Skink)			
374.	25100 <i>Egernia napoleonis</i>			
375.	25250 <i>Elapognathus coronatus</i> (Crowned Snake)			
376.	30919 <i>Hemiergis gracilipes</i> (skink)			
377.	25118 <i>Hemiergis peronii</i> subsp. <i>tridactyla</i>			
378.	25119 <i>Hemiergis quadrilineata</i>			
379.	25131 <i>Lerista distinguenda</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
380.	25133 <i>Lerista elegans</i>			
381.	25005 <i>Lialis burtonis</i>			
382.	42413 <i>Lissolepis luctuosa</i> (Western Swamp Skink)			
383.	25184 <i>Menetia greyii</i>			
384.	25191 <i>Morethia lineocellata</i>			
385.	25192 <i>Morethia obscura</i>			
386.	25252 <i>Notechis scutatus</i> (Tiger Snake)			
387.	25255 <i>Parasuta nigriceps</i>			
388.	25510 <i>Pogona minor</i> (Dwarf Bearded Dragon)			
389.	24907 <i>Pogona minor subsp. minor</i> (Dwarf Bearded Dragon)			
390.	25259 <i>Pseudonaja affinis subsp. affinis</i> (Dugite)			
391.	25266 <i>Simoselaps bertholdi</i> (Jan's Banded Snake)			
392.	25519 <i>Tiliqua rugosa</i>			
393.	25207 <i>Tiliqua rugosa subsp. rugosa</i>			
394.	25218 <i>Varanus gouldii</i> (Bungarra or Sand Monitor)			

Conservation Codes

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

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



EPBC Act Protected Matters Report

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

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

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

Report created 08/03/19 14:42:56

[Summary](#)

[Details](#)

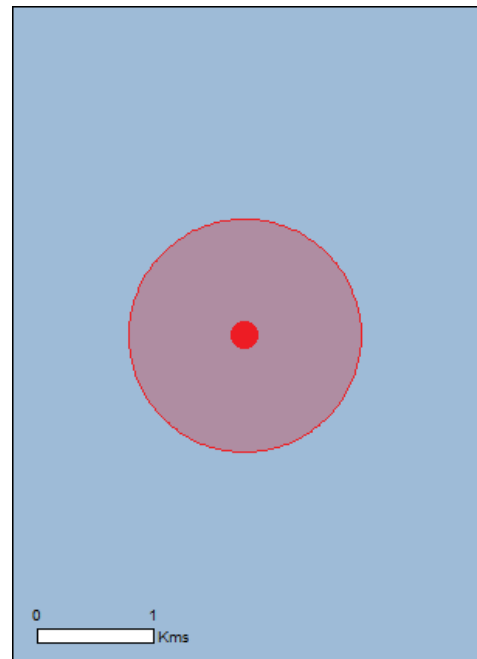
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

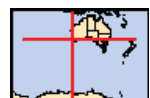
[Acknowledgements](#)



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

[Coordinates](#)

Buffer 1.0 km



Summary

Matters of National Environmental Significance

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

World Heritage Properties	None
National Heritage Places	None
Wetlands of International Importance	None
Great Barrier Reef Marine Park	None
Commonwealth Marine Area	None
Listed Threatened Ecological Communities	1
Listed Threatened Species	21
Listed Migratory Species	9

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land	None
Commonwealth Heritage Places	None
Listed Marine Species	13
Whales and Other Cetaceans	None
Critical Habitats	None
Commonwealth Reserves (Terrestrial)	None
Australian Marine Parks	None

Extra Information

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

State and Territory Reserves	None
Regional Forest Agreements	1
Invasive Species	22
Nationally Important Wetlands	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information](#)

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

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information](#)

Name	Status	Type of Presence
------	--------	------------------

Birds

Calidris ferruginea Curlew Sandpiper 1856	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Carrak 167034	Vulnerable	Species or species habitat likely to occur within area
Calyptorhynchus baudinii Baudin's Cockatoo, Long-billed Black-Cockatoo 1769	Endangered	Breeding likely to occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo 159523	Endangered	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew 1847	Critically Endangered	Species or species habitat may occur within area

Mammals

Dasyurus leopoldi Chuditch, Western Quoll 1330	Vulnerable	Species or species habitat likely to occur within area
Pseudocheirus occidentalis Western Ringtail Possum, Numbayir, Womp, Woder, Nabor, Noolanbit 125911	Critically Endangered	Species or species habitat known to occur within area

Other

Westralunio carteri Carter's Freshwater Mussel, Freshwater Mussel 186266	Vulnerable	Species or species habitat known to occur within area
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Plants

Banksia nivea subsp. uliginosa Swamp Bonepot 182766	Endangered	Species or species habitat may occur within area
Banksia squarrosa subsp. arillacea Whicher Range Dryandra 182769	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Brachyscias verecundus Ironstone Brachyscias 81321	Critically Endangered	Species or species habitat may occur within area
Caladenia hoffmanii Hoffman's Spiderorchid 56719	Endangered	Species or species habitat may occur within area
Chamelaucium sp. S coastal plain (R.D.Royce 4872) Royce's Warbler 87814	Vulnerable	Species or species habitat may occur within area
Drakaea micrantha Dwarf Hammerorchid 56755	Vulnerable	Species or species habitat may occur within area
Eleocharis keigheryi Keighery's Eleocharis 64893	Vulnerable	Species or species habitat may occur within area
Gastrolobium papilio Butterfly-leaved Gastrolobium 78415	Endangered	Species or species habitat may occur within area
Lambertia echinata subsp. occidentalis Western Prickly Oneysuckle 64528	Endangered	Species or species habitat may occur within area
Sphenotoma drummondii Mountain Paperheath 21160	Endangered	Species or species habitat may occur within area
Synaphea sp. Fairbridge Farm (D. Papenfus 696) Selena's Synaphea 82881	Critically Endangered	Species or species habitat may occur within area
Synaphea sp. Serpentine (G.R. Brand 103) 86879	Critically Endangered	Species or species habitat may occur within area
Synaphea stenoloba Dellin Cup Synaphea 66311	Endangered	Species or species habitat may occur within area

Listed Migratory Species

Resource Information

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

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

Migratory Marine Birds

[Apus pacificus](#)

Fork-tailed Shearwater 678

Species or species habitat likely to occur within area

Migratory Terrestrial Species

[Motacilla cinerea](#)

Grey Warbler 642

Species or species habitat may occur within area

Migratory Wetlands Species

[Actitis hypoleucos](#)

Common Sandpiper 59309

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper 874

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper 856

Critically Endangered

Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris melanotos Pectoral Sandpiper 1858		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew 1847	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Sperechthys 1952		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank 1832		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	Type of Presence
Birds	
Actitis hypoleucos Common Sandpiper 159309	Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift 1678	Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret 159541	Species or species habitat likely to occur within area
Ardea ibis Cattle Egret 159542	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper 1874	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper 1856	Critically Endangered Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper 1858	Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-eagle 1943	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater 1670	Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail 1642	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew 1847	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Hairy Woodpecker 1952		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank 1832		Species or species habitat likely to occur within area

Extra Information

Regional Forest Agreements [Resource Information](#)

Note that all areas with completed RFAs have been included.

Name	State
South West WA RFA	Western Australia

Invasive Species [Resource Information](#)

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

Name	Status	Type of Presence
Birds		
Anas platyrhynchos Mallard 1974		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon 1803		Species or species habitat likely to occur within area
Streptopelia senegalensis Australian Quail-dove, Australian Dove 1781		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling 1389		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle 116		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog 182654		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat 119		Species or species habitat likely to occur within area
Mus musculus House Mouse 1120		Species or species habitat likely to occur within area

Name	Status	Type of Presence
<i>Lepus cuniculus</i> Rabbit, European Rabbit 128		Species or species habitat likely to occur within area
<i>Rattus rattus</i> Black Rat, Ship Rat 84		Species or species habitat likely to occur within area
<i>Sus scrofa</i> Pig 6		Species or species habitat likely to occur within area
<i>Vulpes vulpes</i> Red Fox, Fox 18		Species or species habitat likely to occur within area
Plants		
<i>Asparagus asparagoides</i> Bridal Creeper, Bridal Veil Creeper, Smilax Florist's Smilax, Smilax Asparagus 22473		Species or species habitat likely to occur within area
<i>Brachiaria mutica</i> Para Grass 5879		Species or species habitat may occur within area
<i>Cenchrus ciliaris</i> Buffelgrass, Black Buffelgrass 20213		Species or species habitat may occur within area
<i>Chrysanthemoides monilifera</i> Bitou Bush, Boneseed 18983		Species or species habitat may occur within area
<i>Genista linifolia</i> Flaxleaved Broom, Mediterranean Broom, Flax Broom 2800		Species or species habitat likely to occur within area
<i>Genista</i> sp. <i>Genista monspessulana</i> Broom 67538		Species or species habitat may occur within area
<i>Ulex europaea</i> Ulex, Common Ulex 9160		Species or species habitat may occur within area
<i>Pinus radiata</i> Radiata Pine Monterey Pine, Insular Pine, Wilding Pine 20780		Species or species habitat may occur within area
<i>Rubus fruticosus</i> aggregate Blackberry, European Blackberry 68406		Species or species habitat likely to occur within area
<i>Salix</i> spp. except <i>S. babylonica</i> , <i>S. calodendron</i> and <i>S. reichardtii</i> Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow 68497		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) or with point locations and described habitat or environmental modelling (MACE or BCCIM habitat modelling) using point locations and environmental data layers.

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

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

- migratory and
- marine

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

- threatened species listed as extinct or considered as variants
- 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, variant, 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

133.51841 115.74103

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.

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APPENDIX D

BLACK COCKATOO HABITAT TREE DETAILS

Habitat Trees

DBH >50cm

Datum - GDA94

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

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt001	50H	383532	6290820	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt002	50H	383525	6290809	Marri	20+	>50	0		No Signs	No Signs	No	
wpt003	50H	383342	6290819	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt004	50H	383294	6290802	Marri	20+	>50	0		No Signs	No Signs	No	
wpt005	50H	383260	6290797	Marri	20+	>50	1	Large (cockatoo)	No Signs	No Signs	Yes	Possible spout
wpt006	50H	383185	6290812	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt007	50H	383129	6290813	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt008	50H	383120	6290814	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt009	50H	383105	6290804	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt010	50H	383048	6290812	Jarrah	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt011	50H	382830	6290809	Jarrah	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt012	50H	382822	6290787	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt013	50H	382826	6290789	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt014	50H	382803	6290796	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt015	50H	382793	6290785	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt016	50H	382778	6290802	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt017	50H	382765	6290801	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt018	50H	382750	6290795	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt019	50H	382742	6290756	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt020	50H	382751	6290746	Jarrah	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt021	50H	382746	6290733	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt022	50H	382768	6290741	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt023	50H	382761	6290745	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt024	50H	382774	6290733	Marri	10-15	>50	0		No Signs	No Signs	No	
wpt025	50H	382777	6290728	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt026	50H	382790	6290738	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt027	50H	382805	6290751	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt028	50H	382811	6290745	Dead Unknown	15-20	>50	0		No Signs	No Signs	No	
wpt029	50H	382814	6290746	Marri	15-20	>50	0		No Signs	No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt030	50H	382819	6290739	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt031	50H	382840	6290737	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt032	50H	382838	6290770	Dead Unknown	5-10	>50	1	Medium	No Signs	No Signs	No	
wpt033	50H	382828	6290776	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt034	50H	382803	6290785	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt035	50H	382800	6290774	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt036	50H	382781	6290759	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt037	50H	382926	6290781	Marri	20+	>50	0		No Signs	No Signs	No	
wpt038	50H	383405	6290315	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt039	50H	382927	6290793	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt040	50H	382941	6290781	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt041	50H	382955	6290773	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt042	50H	382990	6290788	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt043	50H	382994	6290799	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt044	50H	383022	6290775	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt045	50H	383037	6290762	Jarrah	15-20	>50	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	
wpt046	50H	383060	6290774	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt047	50H	383069	6290762	Jarrah	5-10	>50	0		No Signs	No Signs	No	
wpt048	50H	383109	6290784	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt049	50H	383113	6290751	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt050	50H	383134	6290737	Jarrah	15-20	>50	1	Medium	No Signs	No Signs	No	
wpt051	50H	383124	6290736	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt052	50H	383126	6290733	Marri	20+	>50	0		No Signs	No Signs	No	
wpt053	50H	383120	6290732	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt054	50H	383104	6290737	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt055	50H	383104	6290721	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt056	50H	383104	6290727	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt057	50H	383100	6290732	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt058	50H	383079	6290717	Marri	20+	>50	0		No Signs	No Signs	No	
wpt059	50H	383074	6290715	Marri	20+	>50	0		No Signs	No Signs	No	
wpt060	50H	383081	6290696	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt061	50H	383071	6290692	Marri	10-15	>50	0		No Signs	No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt062	50H	383055	6290669	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt063	50H	383040	6290670	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt064	50H	383037	6290638	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt065	50H	383037	6290634	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt066	50H	383029	6290619	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt067	50H	383010	6290612	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt068	50H	382973	6290637	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt069	50H	382975	6290659	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt070	50H	382972	6290660	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt071	50H	382966	6290675	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt073	50H	382949	6290692	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt074	50H	382961	6290713	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt075	50H	382970	6290776	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt076	50H	383002	6290757	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt077	50H	383005	6290751	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt078	50H	383012	6290737	Jarrah	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt079	50H	383033	6290728	Marri	10-15	>50	2+	Medium	No Signs	No Signs	No	
wpt080	50H	383063	6290727	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt081	50H	383074	6290735	Jarrah	10-15	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt082	50H	383086	6290766	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt083	50H	383005	6290727	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt084	50H	383004	6290711	Marri	20+	>50	0		No Signs	No Signs	No	
wpt085	50H	382996	6290698	Jarrah	20+	>50	2+	Small	No Signs	No Signs	No	
wpt086	50H	382993	6290712	Jarrah	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt087	50H	382992	6290715	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt088	50H	382989	6290718	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt089	50H	382985	6290727	Jarrah	15-20	>50	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Possible knot hole and spout branch
wpt090	50H	383279	6290747	Marri	20+	>50	0		No Signs	No Signs	No	
wpt091	50H	383289	6290746	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt092	50H	383296	6290721	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt093	50H	383293	6290711	Marri	20+	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt094	50H	383276	6290725	Jarrah	15-20	>50	2+	Medium-Large (cockatoo)	No Signs	No Signs	Yes	Possible knot hole - some signs of use?

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt095	50H	383265	6290683	Marri	15-20	>50	2+	Large (cockatoo)	No Signs	No Signs	Yes	Larh knot hole
wpt096	50H	383278	6290678	Dead Marri	15-20	>50	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Possible large top opening hollow
wpt097	50H	383279	6290662	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt098	50H	383259	6290667	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt099	50H	383246	6290663	Jarrah	15-20	>50	2+	Medium-Large (cockatoo)	No Signs	No Signs	Yes	Possible large spout
wpt100	50H	383255	6290650	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt101	50H	383253	6290633	Marri	20+	>50	0		No Signs	No Signs	No	
wpt102	50H	383253	6290622	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt103	50H	383251	6290621	Marri	20+	>50	0		No Signs	No Signs	No	
wpt104	50H	383238	6290621	Jarrah	15-20	>50	1	Medium	No Signs	Rub marks	No	
wpt105	50H	383229	6290629	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt106	50H	383223	6290629	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt107	50H	383259	6290615	Marri	20+	>50	0		No Signs	No Signs	No	
wpt108	50H	383267	6290618	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt109	50H	383268	6290614	Marri	15-20	>50	1	Medium	No Signs	No Signs	No	
wpt110	50H	383275	6290610	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt111	50H	383319	6290608	Marri	20+	>50	0		No Signs	No Signs	No	
wpt112	50H	383348	6290606	Marri	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt113	50H	383361	6290598	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt114	50H	383360	6290589	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt115	50H	383373	6290594	Marri	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt116	50H	383381	6290600	Marri	20+	>50	0		No Signs	No Signs	No	
wpt117	50H	383390	6290605	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt118	50H	383400	6290612	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt119	50H	383397	6290593	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt120	50H	383423	6290584	Marri	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt121	50H	383414	6290607	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt122	50H	383474	6290601	Marri	20+	>50	0		No Signs	No Signs	No	
wpt123	50H	383476	6290614	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt124	50H	383479	6290622	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt125	50H	383475	6290638	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt126	50H	383487	6290632	Jarrah	15-20	>50	0		No Signs	No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt127	50H	383525	6290672	Marri	20+	>50	0		No Signs	No Signs	No	
wpt128	50H	383524	6290681	Marri	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt129	50H	383534	6290687	Dead Marri	15-20	>50	2+	Medium-Large (cockatoo)	No Signs	No Signs	Yes	
wpt130	50H	383532	6290691	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt131	50H	383545	6290699	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt132	50H	383543	6290706	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt133	50H	383536	6290715	Marri	20+	>50	0		No Signs	No Signs	No	
wpt134	50H	383518	6290703	Dead Jarrah	15-20	>50	1	Large (cockatoo)	No Signs	No Signs	Yes	Possible spout
wpt135	50H	383522	6290724	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt136	50H	383517	6290731	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt137	50H	383517	6290749	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt138	50H	383502	6290764	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt139	50H	383481	6290756	Marri	20+	>50	0		No Signs	No Signs	No	
wpt140	50H	383463	6290767	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt141	50H	383452	6290768	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt142	50H	383440	6290772	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt143	50H	383434	6290769	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt144	50H	383430	6290764	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt145	50H	383412	6290776	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt146	50H	383397	6290772	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt147	50H	383388	6290772	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt148	50H	383374	6290767	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt149	50H	383373	6290771	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt150	50H	383370	6290758	Marri	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt151	50H	383365	6290755	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt152	50H	383362	6290767	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt153	50H	383353	6290765	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt154	50H	383348	6290765	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt155	50H	383324	6290717	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt156	50H	383316	6290749	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt157	50H	383329	6290685	Jarrah	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt158	50H	383319	6290671	Marri	15-20	>50	0		No Signs	No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt159	50H	383305	6290655	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt160	50H	383302	6290653	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt161	50H	383307	6290635	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt162	50H	383317	6290631	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt163	50H	383342	6290634	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt164	50H	383348	6290633	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt165	50H	383357	6290616	Dead Marri	20+	>50	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	
wpt166	50H	383370	6290624	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt167	50H	383376	6290624	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt168	50H	383359	6290655	Jarrah	10-15	>50	0		No Signs	No Signs	No	
wpt169	50H	383384	6290636	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt170	50H	383390	6290631	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt171	50H	383410	6290640	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt172	50H	383419	6290641	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt173	50H	383422	6290637	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt174	50H	383425	6290642	Dead Marri	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt175	50H	383436	6290657	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt176	50H	383451	6290653	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt177	50H	383455	6290655	Dead Marri	15-20	>50	0		No Signs	No Signs	No	
wpt178	50H	383453	6290655	Jarrah	10-15	>50	0		No Signs	No Signs	No	
wpt179	50H	383458	6290670	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt180	50H	383472	6290664	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt181	50H	383480	6290654	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt182	50H	383469	6290678	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt183	50H	383492	6290683	Dead Unknown	10-15	>50	1	Medium-Large (cockatoo)	No Signs	No Signs	Yes	Possible large spout
wpt184	50H	383493	6290684	Jarrah	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt185	50H	383503	6290685	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt186	50H	383507	6290693	Marri	20+	>50	0		No Signs	No Signs	No	
wpt187	50H	383510	6290703	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt188	50H	383521	6290697	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt189	50H	383503	6290717	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt190	50H	383481	6290718	Jarrah	15-20	>50	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Possible large top opening hollow

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt191	50H	383466	6290714	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt192	50H	383476	6290744	Marri	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt193	50H	383452	6290733	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt194	50H	383419	6290731	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt195	50H	383419	6290728	Marri	15-20	>50	1	Large (cockatoo)	No Signs	Rub marks	Yes	Possible large knot hole
wpt196	50H	383409	6290723	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt197	50H	383404	6290724	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt198	50H	383397	6290748	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt199	50H	383377	6290708	Marri	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt200	50H	383402	6290670	Dead Unknown	10-15	>50	1	Large (cockatoo)	No Signs	No Signs	Yes	Possible spout
wpt201	50H	383399	6290648	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt202	50H	383417	6290681	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt203	50H	383429	6290681	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt204	50H	383430	6290685	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt205	50H	383425	6290701	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt206	50H	383420	6290702	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt207	50H	383452	6290693	Jarrah	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt208	50H	383395	6290311	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt209	50H	383385	6290313	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt210	50H	383306	6290306	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt211	50H	383243	6290304	Dead Unknown	15-20	>50	0		No Signs	No Signs	No	
wpt212	50H	383233	6290304	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt213	50H	383219	6290320	Dead Unknown	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt214	50H	383200	6290330	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt215	50H	383200	6290348	Jarrah	15-20	>50	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Numerous possible large hollows
wpt216	50H	383166	6290337	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt217	50H	383163	6290325	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt218	50H	383142	6290316	Dead Marri	20+	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt219	50H	383124	6290328	Dead Unknown	15-20	>50	2+	Medium-Large (cockatoo)	No Signs	No Signs	Yes	Possible spout
wpt220	50H	383110	6290319	Dead Jarrah	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt221	50H	383108	6290309	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt222	50H	383094	6290325	Marri	5-10	>50	1	Large (cockatoo)	No Signs	No Signs	Yes	Possible spout (~4m high)

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt223	50H	383091	6290324	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt224	50H	383083	6290307	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt225	50H	383081	6290308	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt226	50H	383070	6290339	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt227	50H	383061	6290335	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt228	50H	383056	6290329	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt229	50H	383037	6290325	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt230	50H	383024	6290308	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt231	50H	382999	6290328	Jarrah	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt232	50H	382986	6290312	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt233	50H	382955	6290304	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt234	50H	382951	6290302	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt235	50H	382914	6290302	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt236	50H	382900	6290315	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt237	50H	382872	6290309	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt238	50H	382819	6290308	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt239	50H	382814	6290310	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt240	50H	382800	6290317	Dead Jarrah	10-15	>50	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Possible hollows in large branches
wpt241	50H	382798	6290317	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt242	50H	382771	6290339	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt243	50H	382780	6290338	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt244	50H	382813	6290349	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt245	50H	382819	6290362	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt246	50H	382831	6290350	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt247	50H	382830	6290337	Marri	5-10	>50	1	Large (cockatoo)	No Signs	No Signs	Yes	Possible spout
wpt248	50H	382848	6290337	Jarrah	15-20	>50	1	Large (cockatoo)	No Signs	No Signs	Yes	Possible spout
wpt249	50H	382856	6290361	Marri	5-10	>50	1	Medium	No Signs	No Signs	No	
wpt250	50H	382919	6290342	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt251	50H	382890	6290378	Dead Unknown	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt252	50H	382908	6290388	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt253	50H	382881	6290382	Dead Unknown	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt254	50H	382892	6290391	Dead Unknown	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 Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt255	50H	382882	6290399	Jarrah	10-15	>50	0		No Signs	No Signs	No	
wpt256	50H	382906	6290414	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt257	50H	382894	6290431	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt258	50H	382886	6290483	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt259	50H	382901	6290504	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt260	50H	382953	6290514	Dead Unknown	0-5	>50	1	Large (cockatoo)	No Signs	No Signs	Yes	Possible spout
wpt261	50H	382951	6290579	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt262	50H	382944	6290584	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt263	50H	382970	6290594	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt264	50H	382990	6290602	Jarrah	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt265	50H	382998	6290597	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt266	50H	383009	6290589	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt267	50H	382989	6290571	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt268	50H	382997	6290561	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt269	50H	382981	6290519	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt270	50H	382981	6290519	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt271	50H	382978	6290519	Jarrah	15-20	>50	1	Medium	No Signs	No Signs	No	
wpt272	50H	382977	6290512	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt273	50H	382973	6290509	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt274	50H	382986	6290479	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt275	50H	383002	6290469	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt276	50H	383006	6290468	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt277	50H	383005	6290440	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt278	50H	383033	6290438	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt279	50H	383061	6290432	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt280	50H	383021	6290422	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt281	50H	383032	6290387	Jarrah	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt282	50H	383026	6290375	Jarrah	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt283	50H	383038	6290378	Jarrah	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt284	50H	383032	6290345	Jarrah	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt285	50H	383025	6290350	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt286	50H	383022	6290350	Jarrah	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 Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt287	50H	382997	6290349	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt288	50H	383000	6290366	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt289	50H	382982	6290342	Dead Unknown	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt290	50H	382964	6290347	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt291	50H	382936	6290414	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt292	50H	382931	6290418	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt293	50H	382936	6290418	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt294	50H	382926	6290433	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt295	50H	382938	6290448	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt296	50H	382949	6290438	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt297	50H	382929	6290460	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt298	50H	382931	6290473	Jarrah	15-20	>50	1	Large (cockatoo)	No Signs	No Signs	Yes	Possible spout
wpt299	50H	382982	6290448	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt300	50H	382985	6290455	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt301	50H	382972	6290441	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt302	50H	382970	6290432	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt303	50H	382972	6290407	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt304	50H	382964	6290390	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt305	50H	382999	6290401	Jarrah	0-5	>50	0		No Signs	No Signs	No	
wpt306	50H	383056	6290408	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt307	50H	383062	6290418	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt308	50H	383071	6290408	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt309	50H	383097	6290418	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt310	50H	383106	6290447	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt311	50H	383099	6290462	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt312	50H	383089	6290497	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt313	50H	383099	6290500	Jarrah	15-20	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt314	50H	383106	6290498	Marri	20+	>50	0		No Signs	No Signs	No	
wpt315	50H	383120	6290491	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt316	50H	383115	6290511	Jarrah	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt317	50H	383167	6290516	Jarrah	20+	>50	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Possible large fissure
wpt318	50H	383172	6290501	Jarrah	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 Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt319	50H	383171	6290531	Jarrah	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt320	50H	383197	6290539	Dead Unknown	0-5	>50	0		No Signs	No Signs	No	
wpt321	50H	383205	6290547	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt322	50H	383196	6290579	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt323	50H	383214	6290586	Marri	20+	>50	0		No Signs	No Signs	No	
wpt324	50H	383207	6290564	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt325	50H	383209	6290542	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt326	50H	383216	6290554	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt327	50H	383227	6290553	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt328	50H	383216	6290536	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt329	50H	383224	6290524	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt330	50H	383208	6290518	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt331	50H	383228	6290498	Marri	20+	>50	0		No Signs	No Signs	No	
wpt332	50H	383211	6290494	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt333	50H	383211	6290480	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt334	50H	383204	6290473	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt335	50H	383199	6290457	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt336	50H	383215	6290455	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt337	50H	383211	6290439	Marri	5-10	>50	0		No Signs	No Signs	No	
wpt338	50H	383212	6290412	Marri	20+	>50	0		No Signs	No Signs	No	
wpt339	50H	383227	6290381	Marri	20+	>50	0		No Signs	No Signs	No	
wpt340	50H	383190	6290364	Marri	20+	>50	0		No Signs	No Signs	No	
wpt341	50H	383175	6290378	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt342	50H	383173	6290382	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt343	50H	383171	6290389	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt344	50H	383161	6290369	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt345	50H	383133	6290350	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt346	50H	383101	6290346	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt347	50H	383084	6290370	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt348	50H	383140	6290393	Marri	20+	>50	0		No Signs	No Signs	No	
wpt349	50H	383146	6290407	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt350	50H	383160	6290415	Marri	15-20	>50	0		No Signs	No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt351	50H	383142	6290444	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt352	50H	383126	6290469	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt353	50H	383129	6290477	Jarrah	5-10	>50	1	Medium	No Signs	No Signs	No	
wpt354	50H	383129	6290488	Dead Unknown	5-10	>50	1	Medium	No Signs	No Signs	No	
wpt355	50H	383179	6290484	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt356	50H	383193	6290490	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt357	50H	383186	6290528	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt358	50H	383190	6290447	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt359	50H	383181	6290427	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt360	50H	383195	6290416	Marri	15-20	>50	1	Medium	No Signs	No Signs	No	
wpt361	50H	383184	6290408	Dead Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt362	50H	383193	6290384	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt363	50H	383237	6290480	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt364	50H	383260	6290494	Marri	20+	>50	0		No Signs	No Signs	No	
wpt365	50H	383265	6290498	Marri	15-20	>50	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Possible spout
wpt366	50H	383249	6290523	Marri	20+	>50	0		No Signs	No Signs	No	
wpt367	50H	383265	6290554	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt368	50H	383270	6290554	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt369	50H	383267	6290475	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt370	50H	383276	6290464	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt371	50H	383262	6290440	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt372	50H	383275	6290434	Marri	20+	>50	0		No Signs	No Signs	No	
wpt373	50H	383253	6290405	Jarrah	20+	>50	2+	Small-Medium	No Signs	No Signs	No	
wpt374	50H	383240	6290398	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt375	50H	383232	6290389	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt376	50H	383241	6290370	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt377	50H	383250	6290339	Jarrah	15-20	>50	1	Large (cockatoo)	No Signs	No Signs	Yes	Possible spout
wpt378	50H	383269	6290353	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt379	50H	383272	6290342	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt380	50H	383268	6290342	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt381	50H	383262	6290333	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt382	50H	383278	6290354	Jarrah	15-20	>50	0		No Signs	No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt383	50H	383289	6290346	Marri	10-15	>50	0		No Signs	No Signs	No	
wpt384	50H	383303	6290328	Jarrah	5-10	>50	1	Large (cockatoo)	No Signs	No Signs	Yes	Possible spout
wpt385	50H	383312	6290326	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt386	50H	383316	6290336	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt387	50H	383328	6290339	Marri	20+	>50	0		No Signs	No Signs	No	
wpt388	50H	383356	6290328	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt389	50H	383354	6290324	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt390	50H	383351	6290343	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt391	50H	383383	6290347	Marri	20+	>50	0		No Signs	No Signs	No	
wpt392	50H	383386	6290344	Marri	20+	>50	0		No Signs	No Signs	No	
wpt393	50H	383383	6290332	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt394	50H	383389	6290328	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt395	50H	383405	6290325	Marri	20+	>50	0		No Signs	No Signs	No	
wpt396	50H	383459	6290421	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt397	50H	383461	6290427	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt398	50H	383458	6290429	Marri	20+	>50	0		No Signs	No Signs	No	
wpt399	50H	383452	6290446	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt400	50H	383437	6290459	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt401	50H	383462	6290467	Marri	20+	>50	0		No Signs	No Signs	No	
wpt402	50H	383468	6290468	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt403	50H	383466	6290445	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt404	50H	383476	6290441	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt405	50H	383474	6290425	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt406	50H	383487	6290431	Dead Unknown	15-20	>50	2+	Small	No Signs	No Signs	No	

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