

Fauna Habitat Assessment



Denny Avenue Level Crossing Removal Project

Kelmscott

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FINAL

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SUMMARY

This report details the results of a fauna habitat assessment of a 21.4 hectare (ha) area of land associated with the Public Transport Authority's (PTA) proposed Denny Avenue Level Crossing Removal Project (the subject site). The assessment was primarily undertaken for the purposes of identifying the presence of conservation significant fauna species and/or their habitat and includes a literature review and field reconnaissance survey.

A list of potential conservation significant fauna species considered likely to occur in the general vicinity of the subject site has been compiled from information obtained during the literature review. Their likelihood of occurrence was assessed based on the results of the field reconnaissance survey and habitat assessment.

The subject site is situated in an established residential and commercial area on the eastern fringe of the central Swan Coastal Plain. The vast majority of the area has been cleared of native vegetation and is now mainly comprised of roads, rail lines, carparks, retail, residential and other associated infrastructure.

Vegetation within the subject site is largely confined to road verges and residential gardens. Vegetation along road verges is comprised of grassland or planted exotic, non-endemic and native endemic trees and shrubs of variable composition and density.

Overall fauna values of the subject site are rated as very low given the highly degraded nature of the majority of the area. Fauna biodiversity within the subject site would be depauperate, however given the presence of some vegetation, and in particular native woodland vegetation (e.g. Marri trees), the area still has value for some fauna species able to persist in degraded habitats of this type.

Most of the fauna species likely to be present would be common, widespread species (mainly birds), with a few exceptions (e.g. Black Cockatoos). The vast majority of conservation significant species identified as having been previously recorded in the wider area would not persist in the subject site primarily due to a complete lack of suitable habitat (i.e. quality and/or extent).

Twelve fauna species, all birds, were observed during the field survey (see Appendix C). The limited number of fauna species observed can be attributed to the small size of the subject site, the limited extent of vegetation and its generally highly degraded state.

Three species of conservation significance were positively identified as utilising the subject site for some purpose during the course of the field survey (Forest Red-tailed Black-Cockatoo, Carnaby's Black Cockatoo and Baudin's Black Cockatoo).

Based on habitats present, one additional species of conservation significance, the Peregrine Falcon may possibly occur within the subject site, but its current status on-site and/or in the general area is difficult to assess because it was not sighted during the survey and no evidence of use of the survey area was found. This species is generally uncommon and only likely to occur very occasionally and then only for brief periods.

The Black Cockatoo habitat tree assessment identified a total of 104 trees with a Diameter at Breast Height (DBH) of ≥ 50 cms within the subject site. The vast majority of trees (100) appeared to not contain hollows of any size. Four trees contained apparent or obvious hollows, all of which were assessed as being unlikely to be big enough for Black Cockatoos to currently use for nesting purposes, due to the hollows' apparent small size, unsuitable orientation and/or height above ground level. Two of these trees contained hollows in use by feral bees and therefore could not currently be used by Black Cockatoos. No evidence of breeding use was noted.

Evidence of Black Cockatoos foraging was observed during the field survey in the form of chewed Marri and Jarrah fruits and Banksia cones. This evidence was attributed to the Forest Red-tailed Black-Cockatoo, Carnaby's Black Cockatoo and/or Baudin's Black Cockatoo depending on the nature of the evidence observed. Evidence left by the Forest Red-tailed Black Cockatoo was most prevalent.

It is difficult to estimate the extent of quality natural foraging habitat within the subject site given it is largely comprised of patchy, fragmented vegetation, but it is unlikely to total more than 2.5 ha (i.e. mainly areas containing Marri, Jarrah and/or Banksia).

No evidence of Black Cockatoos roosting within trees located inside the subject site was observed during the survey period.

The impact on the significant species listed as present or potentially being present will vary depending on their current degree of utilisation/population densities and preferred habitat requirements (e.g. quantity and quality of potential foraging habitat that will be affected when clearing of the site is undertaken). The potential impacts on these fauna species and/or their habitat should be taken into consideration during ongoing planning.

1. INTRODUCTION

This report details the results of a fauna habitat assessment of a 21.4 ha area of land associated with the Public Transport Authority's (PTA) proposed Denny Avenue Level Crossing Removal Project (subject site) (Figure 1).

The information contained within this report will be incorporated into an overall environmental impact assessment and environmental approvals advice report being prepared by Aurora Environmental.

2. SCOPE OF WORKS

Desktop Assessment:

The scope of works (with respect to fauna) defined by the PTA was to conduct a desktop review of publicly available information and reports to assess the potential presence of conservation significant fauna and their habitat within the subject site.

Reconnaissance Fauna Survey:

The scope of works (with respect to fauna) defined by the PTA was to conduct a reconnaissance fauna survey, in accordance with *Technical Guidance - Terrestrial Fauna Surveys* (EPA 2016a) and *Technical Guidance – Sampling Methods for Terrestrial Vertebrate Fauna* (EPA 2016b) to identify:

- The presence or potential presence of conservation significant fauna species (e.g. Threatened or Priority Fauna) within the environmental survey boundary (including mapping).
- Assess habitats suitable for conservation significant fauna species.
- Fauna habitat types within the environmental survey boundary (including mapping).

The scope of works defined by the PTA was to conduct a targeted Black Cockatoo¹ habitat survey to:

- Identify Black Cockatoo habitat (foraging, breeding, roosting habitat) within the environmental survey boundary, including GPS locations of breeding habitat trees.

¹ Note: For the purposes of this report the term Black Cockatoo is in reference to all three species i.e. Baudin's Black Cockatoo (*Calyptrorhynchus baudinii*), Carnaby's Black Cockatoo (*Calyptrorhynchus latirostris*) and the Forest Red-tailed Black Cockatoo (*Calyptrorhynchus banksii naso*), unless stated otherwise.

- Identify breeding trees suitable for Black Cockatoo nesting, as outlined in the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* referral guidelines (DSEWPaC 2012)
- Search trees for evidence of Black Cockatoo use (e.g. wear around hollows, feathers, chewing, scarring and scratch marks on trunks and branches).

3. METHOD

3.1 LITERATURE REVIEW

A list of fauna recorded or likely to occur within the subject site has been compiled by a review of available databases and literature including, but not limited to the following data sources:

- Department of Biodiversity, Conservation and Attractions (DBCA) Threatened Fauna Database (NatureMap) (DBCA 2018). A 10-kilometre (km) buffer around a central point was applied to capture previous fauna records within the immediate vicinity;
- *EPBC Act* Protected Matters database for fauna of national environmental significance (DotEE 2018). The minimum buffer (1 km) was applied to this search as the databases contains distribution data (areas) and not actual fauna records; and
- Literature search and review of other fauna surveys in the vicinity.

The conservation status of each species has been based on current lists produced under Federal and State Acts (*EPBC Act* and the *Wildlife Conservation Act 1950 (WC Act)*), those species recognised under international treaties (CAMBA, JAMBA and the Bonn Convention) and Priority Fauna (as listed by DBCA).

3.2 FIELD SURVEYS

The field component of the fauna assessment was carried out on 18 September 2018 by Greg Harewood (Zoologist) and consisted of a reconnaissance survey, described in the sections below.

3.2.1 FAUNA HABITAT ASSESSMENT

The objective of the habitat assessment was to assess if it was likely that species of conservation significance would utilise the habitats identified within the subject site.

During the field survey, fauna habitats within the survey area were assessed and specific elements identified, which informed the likelihood of listed conservation significant species utilising the area and fauna habitat of significance.

Vegetation units, landforms and soils observed during the site reconnaissance survey have been used to define broad fauna habitat types across the subject site.

3.2.2 FAUNA OBSERVATIONS

The aim of this part of the assessment was to obtain enough information to assess the likely significance of the subject site to fauna species of conservation significance.

Based on the results of the literature review, evidence of the presence or likely presence of fauna species of conservation significance known to or likely to frequent the general area was searched for and recorded during the field survey.

This included but was not limited to:

- Undertaking a series of transects across the subject site.
- Searching for evidence (i.e. individuals, tracks, scats, calls) of potential conservation significant species under logs, rocks and leaf litter.
- Observing bird species with binoculars.

3.2.3 BLACK COCKATOO HABITAT ASSESSMENT

The following methods were employed to comply with the defined scope of works and are based on DSEWPaC (2012) guidelines 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.

DSEWPaC (2012) places habitats used by Black Cockatoos into the following three categories:

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

3.2.3.1 Breeding Habitat Assessment

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

Target tree species included Marri, Jarrah, Tuart and Flooded Gum and any other *Corymbia/Eucalyptus* species of a suitable size that was present. Peppermints, *Banksia*, Sheoak and Melaleuca tree species (for example) were not assessed as they typically do not develop hollows used by Black Cockatoos.

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

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

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

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

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

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

Generally, any tree which is alive or dead that contains one or more possible hollows (cavities within the trunk or branches) suitable for occupation by Black Cockatoo for the purpose of nesting/breeding. 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, was 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).

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

3.2.3.2 Foraging Habitat Assessment

The location and nature of Black Cockatoo foraging evidence (e.g. chewed fruits around 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. Foraging habitat is represented by plant species that are known to provide a food source for Black Cockatoos. This can be in the form of seeds, flowers and also boring grubs that are extracted from some plant species.

A review of available literature was carried out to determine the location/extent of any known/likely Black Cockatoo foraging habitat areas in the vicinity.

3.2.3.3 Night Roosting Habitat Assessment

Direct and indirect evidence of Black Cockatoos roosting within trees on site was noted where observed (e.g. branch clippings, droppings or moulted feathers).

A review of available literature was carried out to determine the location/extent of any known/likely Black Cockatoo roosting habitat areas in the vicinity.

4. SURVEY LIMITATIONS

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

Lack of observational data on some species should also not necessarily be taken as an indication that a species is absent from the site or does not utilise it for some purpose at times.

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

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 LITERATURE REVIEW

The literature review identified a number of fauna species of conservation significance as potentially occurring in the general area. Table 1 lists the species in question. The NatureMap (DBCA 2018) and Protected Matter Search Tool (DotEE 2018) results, used as a primary source for compiling this listing, are held within Appendix B.

Table 1: Conservation significant fauna previously recorded or potentially occurring within the general vicinity of subject site.

Species	Conservation Status ²	
	WC Act/ DBCA Priority	EPBC Act
Carter's Freshwater Mussel <i>Westralunio carteri</i>	S3	VU
McMillan's Biting Midge <i>Austroconops mcmillani</i>	P2	-
Inornate Trapdoor Spider <i>Euoplos inornatus</i>	P1	-
Grey Vernal Katydid <i>Kawaniphila pachomai</i>	P1	-
Unnamed bee <i>Leioproctus contrarius</i>	P3	-
Unnamed bee <i>Leioproctus douglasiellus</i>	S2	CR
Short-tongued Bee <i>Neopasiphae simplicior</i>	S2	CR
Southern Death Adder <i>Acanthophis antarcticus</i>	P3	-
Dell's Skink <i>Ctenotus delli</i>	P4	-
Coastal Plains Skink <i>Ctenotus ora</i>	P3	-
Perth Slider <i>Lerista lineata</i>	P3	-
Malleefowl <i>Leipoa ocellata</i>	S3	VU
Australasian Bittern <i>Botaurus poiciloptilus</i>	S2	EN
Australian Little Bittern <i>Ixobrychus dubius</i>	P4	-

² See Appendix A for conservation status codes

Species	Conservation Status ²	
	WC Act/ DBCA Priority	EPBC Act
Migratory Shorebirds/Wetland Species	Various	Various
Blue-billed Duck <i>Oxyura australis</i>	P4	-
Glossy Ibis <i>Plegadis falcinellus</i>	S5	Mig, Ma
Eastern Osprey <i>Pandion haliaetus</i>	S5	Mig, Ma
Peregrine Falcon <i>Falco peregrinus</i>	S7	-
Carnaby's Black Cockatoo <i>Calyptrorhynchus latirostris</i>	S2	EN
Baudin's Black Cockatoo <i>Calyptrorhynchus baudinii</i>	S2	EN
Forest Red-tailed Black Cockatoo <i>Calyptrorhynchus banksii naso</i>	S3	VU
Fork-tailed Swift <i>Apus pacificus</i>	S5	Mig
Grey Wagtail <i>Motacilla cinerea</i>	S5	Mig
Chuditch <i>Dasyurus geoffroii</i>	S3	VU
South-western Brush-tailed Phascogale <i>Phascogale tapoatafa wambenger</i>	S6	-
Numbat <i>Myrmecobius fasciatus</i>	S3	VU
Quenda <i>Isodon fusciventer</i>	P4	-
Western Ringtail Possum <i>Pseudocheirus occidentalis</i>	S1	CR
Woylie <i>Bettongia penicillata ogilbyi</i>	S1	EN
Quokka <i>Setonix brachyurus</i>	S3	VU
Western Brush Wallaby <i>Notamacropus irma</i>	P4	-
Western False Pipistrelle <i>Falsistrellus mackenziei</i>	P4	-
Water Rat <i>Hydromys chrysogaster</i>	P4	-

5.2 FIELD SURVEYS

5.2.1 FAUNA HABITAT ASSESSMENT


The subject site is situated in an established residential and commercial area on the eastern fringe of the central Swan Coastal Plain. The vast majority of the area has been cleared of native vegetation and is now mainly comprised of roads, rail lines, carparks, retail, residential and other associated infrastructure.



Vegetation within the subject site is largely confined to road verges and residential gardens. Vegetation along road verges is comprised of grassland or planted exotic, non-endemic and native endemic trees and shrubs of variable composition and density. A nature reserve (Camillo Reserve - ~0.27 hectares) is situated on the western side of the subject site and contains a small area of Jarrah-Banksia open woodland.



The individual remnant native trees and groves of trees, while limited in extent, support the primary fauna habitat value. These areas vary in quality, with most areas being totally degraded and lacking significant native groundcover/shrubs and microhabitats such as hollow logs.

Example images of the fauna habitats present within the subject site (based on vegetation types mapped by PGV Environmental 2018) are provided below. The extent of each identified unit is shown in Figure 2.

Table 2: Example Images of the Fauna Habitats within the Subject Site

Fauna Habitat Description	Example Image
<p>Totally cleared – roads, railway reserve, footpaths, vacant blocks, road verges with bare ground or grassland. Includes scattered trees and small areas/gardens.</p> <p>Approximate Area – 17.51 ha</p>	

Fauna Habitat Description	Example Image
<p>Planted non-endemic/exotic trees and shrubs along road verges and in gardens of various composition and density. Includes the occasional endemic tree species.</p> <p>Approximate Area – 1.18 ha</p>	
<p>Jarrah/Marri Woodland over Woody Pear Low Open Woodland</p> <p>Approximate Area - 0.47 ha</p>	
<p>Marri open woodland (and occasional non-endemic/exotic trees)</p> <p>Approximate Area - 1.8 ha</p>	

Fauna Habitat Description	Example Image
<p>Flooded Gum open woodland.</p> <p>Approximate Area – 0.17 ha</p>	
<p>Jarrah/Banksia/Woody Pear Low Open Woodland over Balga Bush/Acacia//Sheoak Shrubland in Camillo Reserve</p> <p>Approximate Area – 0.27 ha</p>	

Overall fauna values of the subject site are rated as very low given the highly degraded nature the majority of the area. Fauna biodiversity within the subject site is depauperate, however, given the presence of some vegetation and in particular native woodland vegetation (e.g. Marri trees), the area still has value for some fauna species able to persist in degraded habitats of this type.

Most of the fauna species likely to be present would be common, widespread species (mainly birds), with a few exceptions (e.g. Black Cockatoos). The vast majority of conservation significant species previously recorded in the wider area would not persist in the subject site primarily due to a complete lack of suitable habitat (i.e. quality and/or extent).

5.2.2 FAUNA OBSERVATIONS

Twelve fauna species, all birds, were observed during the field survey (see Appendix C). The limited number of fauna species observed can be attributed to the small size of the subject site, the limited extent of vegetation and its generally highly degraded state.

With the exception of foraging debris attributed to the Forest Red-tailed Black Cockatoo, Baudin's Black Cockatoo and Carnaby's Black Cockatoos (see section 5.2.3.2) observed

at several locations, no evidence of any of the conservation significant fauna species identified during the literature review was observed. However, this does not eliminate the potential for some species to still occur, if only infrequently.

5.2.3 BLACK COCKATOO HABITAT ASSESSMENT

5.2.3.1 Breeding Habitat Assessment

Trees considered potentially suitable for Black Cockatoos to use as nesting habitat (subject to a suitable hollow being present and other factors) found within the subject site comprised the following species:

- Marri – *Corymbia calophylla*;
- Jarrah – *Eucalyptus marginata*;
- Flooded Gum – *Eucalyptus rudis*;
- Planted non-endemic eucalypts (various unidentified species); and
- Dead unidentified species.

A summary of the habitat trees observed is provided in Table 3. The location of habitat trees is shown in Figure 3.

Table 3: Summary of Habitat Trees (DBH \geq 50cm) within the Subject Site

Total Number of Habitat Trees (DBH \geq 50cm)	Number of Habitat Trees with <u>No Hollows Observed</u>	Number of Habitat Trees with <u>Possible Hollows</u> considered <u>Unsuitable</u> for Black Cockatoos	Number of Habitat Trees with <u>Possible Hollows</u> considered <u>Possibly Suitable</u> for Black Cockatoos	Tree Species				
				Marri	Jarrah	Flooded Gum	Non-Endemic Eucalyptus	Dead Unknown
104	100	4	0	57	9	9	28	1

The assessment identified 104 trees within the subject site with a DBH of \geq 50cm. The vast majority of trees (100) appeared to not contain hollows of any size.

Four trees contained apparent or obvious hollows, all of which were assessed as being unlikely to be suitable for Black Cockatoos to currently use for nesting purposes, due to the hollows apparent small size, unsuitable orientation and/or height above ground level. Two of these trees contained hollows in use by feral bees. No evidence of breeding activity was noted.

The distribution of the various habitat tree species is shown in Figure 4. Additional details on each habitat tree observed can be found in Appendix D.

Based on available mapping, there is approximately 13,200 ha of remnant native vegetation within 10 kilometres of the subject site. Much of this this is likely to contain “potential” breeding habitat as defined by DotEE (i.e. suitable tree species with a DBH $\geq 50\text{cm}$).

5.2.3.2 Foraging Habitat Assessment





The following flora species known to be or are potentially used as a direct food source (e.g. seeds, flowers, nectar, bark or grubs) by one or more species of Black Cockatoo were recorded within the subject site:


- Marri – *Corymbia calophylla*;
- Jarrah – *Eucalyptus marginata*;
- Flooded Gum - *Eucalyptus rudis*;
- Sheoak – *Allocasuarina* spp.
- Banksia – *B. attenuata* & *B. menziesii*; and
- Grass tree – *Xanthorrhoea preissii*.

It should be noted that some of the above-mentioned species (e.g. Flooded Gum, Grass Trees) while foraged upon on occasions are only likely to make up a small proportion of any one bird’s diet relative to more favoured plant species such as Marri. Some tree species are also only represented by a small number of specimens (e.g. Sheoak, Banksia and Grass Trees) and therefore do not contribute to the overall foraging resource to a significant degree.

Evidence of Black Cockatoos foraging was observed during the field survey in the form of chewed Marri and Jarrah fruits and Banksia cones. This evidence was attributed to the Forest Red-tailed Black Cockatoo, Carnaby’s Black Cockatoo and/or Baudin’s Black Cockatoo depending on the nature of the evidence observed, examples of which are provided in Table 4.

Table 4: Foraging Evidence Examples

Foraging Evidence Description	Example Image
Marri fruits – foraging activity attributed to the Forest Red-tailed Black Cockatoo.	
Marri fruits – foraging activity attributed to the Carnaby's Black Cockatoo.	
Marri fruits – foraging activity attributed to the Baudin's Black Cockatoo.	
Jarrah fruits – foraging activity attributed to the Forest Red-tailed or Carnaby's Black Cockatoo.	

Foraging Evidence Description	Example Image
Banksia cone – foraging activity attributed to the Carnaby's Black Cockatoo.	

Foraging debris was relatively common in areas containing Marri with most being attributed to the Forest Red-tailed Black Cockatoo. The distribution of the larger Marri trees (DBH ≥ 50 cm) can be seen in Figure 4.

It is difficult to provide an accurate estimate of the extent of Black Cockatoo foraging habitat within the subject site, given some trees are represented by scattered/isolated specimens, some of which are located amongst non-favoured tree species. Vegetation mapping by PGV Environmental (2018) does however indicate that the main areas of Black Cockatoo foraging habitat within the subject site cover approximately 2.54 ha (i.e. areas mapped as containing Marri, Jarrah and/or Banksia).

Based on available mapping there is about 13,200 ha hectares of remnant native vegetation within 10 km of the subject site. Much of this this is likely to represent Black Cockatoo foraging habitat of some type.

5.2.3.3 Night Roosting Habitat Assessment

No evidence of Black Cockatoos roosting within trees located within the subject site was observed during the survey period. It is difficult to determine if trees or groves of trees within the subject site represent potential roosting habitat as a range of factors, not all of which can be observed, determine suitability. Some of the larger trees (included non-endemics/exotics) may be suitable but as indicated no actual evidence of use was seen.

A review of the 2018 Great Cocky Count database shows no documented roost sites within the subject site. The 2018 Great Cocky Count recorded the closest active roost, approximately 3.7 km north west, used by 16 Forest Red-tailed Black Cockatoos and three White-tailed Black Cockatoos (Peck *et al.* 2018). Another 35 documented roost sites (but not necessarily in current use) occur within 10 km of the subject site.

6. CONSERVATION SIGNIFICANT FAUNA SPECIES

Based on the information gathered during the site reconnaissance survey and the documented distribution and habitat preferences of the species of conservation significance identified as potentially being present in the general area, their likelihood of occurrence has been assessed. A summary of this assessment is presented in Table 5.

Table 5: Likelihood of Occurrence – Fauna Species of Conservation Significance (continues on following pages).

Species	Conservation Status ³		Habitat Present	Likelihood of Occurrence
	WC Act/ DBCA Priori	EPBC Act		
Carter's Freshwater Mussel <i>Westralunio carteri</i>	S3	VU	No	Would Not Occur
McMillan's Biting Midge <i>Austroconops mcmillani</i>	P2	-	No	Would Not Occur
Inornate Trapdoor Spider <i>Euoplos inornatus</i>	P1	-	No	Would Not Occur
Grey Vernal Katydid <i>Kawaniphila pachomai</i>	P1	-	No	Would Not Occur
Unnamed bee <i>Leioproctus contrarius</i>	P3	-	No	Would Not Occur
Unnamed bee <i>Leioproctus douglasiellus</i>	S2	CR	No	Would Not Occur
Short-tongued Bee <i>Neopasiphae simplicior</i>	S2	CR	No	Would Not Occur
Southern Death Adder <i>Acanthophis antarcticus</i>	P3	-	No	Would Not Occur
Dell's Skink <i>Ctenotus delli</i>	P4	-	No	Would Not Occur
Coastal Plains Skink <i>Ctenotus ora</i>	P3	-	No/Very Marginal	Unlikely to Occur
Perth Slider <i>Lerista lineata</i>	P3	-	No/Very Marginal	Unlikely to Occur
Malleefowl <i>Leipoa ocellata</i>	S3	VU	No	Would Not Occur/Regionally Extinct
Australasian Bittern <i>Botaurus poiciloptilus</i>	S2	EN	No	Would Not Occur
Australian Little Bittern <i>Ixobrychus dubius</i>	P4	-	No	Would Not Occur
Migratory Shorebirds/Wetland Species	Various	Various	No	Would Not Occur
Blue-billed Duck <i>Oxyura australis</i>	P4	-	No	Would Not Occur

³ See Appendix A for conservation status codes

Species	Conservation Status ³		Habitat Present	Likelihood of Occurrence
	WC Act/ DBCA Priorit	EPBC Act		
Glossy Ibis <i>Plegadis falcinellus</i>	S5	Mig, Ma	No	Would Not Occur
Eastern Osprey <i>Pandion haliaetus</i>	S5	Mig, Ma	No	Would Not Occur
Peregrine Falcon <i>Falco peregrinus</i>	S7	-	Yes	Possibly Occurs (on rare occasions)
Carnaby's Black Cockatoo <i>Calyptorhynchus latirostris</i>	S2	EN	Yes	Known to Occur
Baudin's Black Cockatoo <i>Calyptorhynchus baudinii</i>	S2	EN	Yes	Known to Occur
Forest Red-tailed Black Cockatoo <i>Calyptorhynchus banksii naso</i>	S3	VU	Yes	Known to Occur
Fork-tailed Swift <i>Apus pacificus</i>	S5	Mig	Yes	Unlikely to Occur except very rarely
Grey Wagtail <i>Motacilla cinerea</i>	S5	Mig	No	Would Not Occur
Chuditch <i>Dasyurus geoffroii</i>	S3	VU	No	Would Not Occur
South-western Brush-tailed Phascogale <i>Phascogale tapoatafa wambenger</i>	S6	-	No	Would Not Occur
Numbat <i>Myrmecobius fasciatus</i>	S3	VU	No	Would Not Occur/Regionally Extinct
Quenda <i>Isodon fusciventer</i>	P4	-	No	Would Not Occur
Western Ringtail Possum <i>Pseudocheirus occidentalis</i>	S1	CR	No	Would Not Occur/Regionally Extinct
Woylie <i>Bettongia penicillata ogilbyi</i>	S1	EN	No	Would Not Occur/Regionally Extinct
Quokka <i>Setonix brachyurus</i>	S3	VU	No	Would Not Occur
Western Brush Wallaby <i>Notamacropus irma</i>	P4	-	No	Would Not Occur
Western False Pipistrelle <i>Falsistrellus mackenziei</i>	P4	-	Yes/Marginal	Unlikely to Occur

Three vertebrate fauna species of conservation significance (listed as State or Federal threatened/migratory species or as DBCA priority species) were positively identified as utilising the subject site for some purpose during the survey period:

- Calyptorhynchus banksii naso* Forest Red-tailed Black Cockatoo – S3 (WC Act), Vulnerable (EPBC Act)

Foraging evidence attributed to this species was observed. Areas of vegetation within the subject site represent foraging habitat for this species. Larger trees (≥ 50 cm DBH) can be considered potential breeding habitat, though no actual breeding activity was evident. No evidence of roosting observed.

- *Calyptorhynchus latirostris* Carnaby's Black Cockatoo – S2 (WC Act), Endangered (EPBC Act)
Foraging evidence attributed to this species was observed. Areas of vegetation within the subject site represent foraging habitat for this species. Larger trees (≥ 50 cm DBH) can be considered potential breeding habitat, though no actual breeding activity was evident. No evidence of roosting observed.
- *Calyptorhynchus baudinii* Baudin's Black Cockatoo – S2 (WC Act), Endangered (EPBC Act)
Foraging evidence attributed to this species was observed. Areas of vegetation within the subject site represent foraging habitat for this species. Larger trees (≥ 50 cm DBH) can be considered potential breeding habitat, though no actual breeding activity was evident. No evidence of roosting observed.

One additional species of conservation significance may possibly utilise the survey area for some purpose at times, but its status on-site and/or in the general area is difficult to determine because none were not sighted during the field survey, or evidence of use was not observed.

- *Falco peregrinus* Peregrine Falcon – S7 (WC Act)
Uncommon so unlikely to be resident in the area but subject site may form part of larger home range. Only likely to occur very infrequently when foraging in air space over the subject site and then only for brief periods. Unlikely to breed in the area.

A number of other species of conservation significance (as listed in Table 5), while possibly present in the wider area (e.g. Darling Range forest areas) are not listed as potentially occurring within the subject site primarily due to a complete lack of suitable habitat (quality and extent) and/or known local/regional extinction.

7. CONCLUSION

The fauna assessment of the proposed Denny Avenue Level Crossing Removal Project area was primarily undertaken for the purposes of identifying the presence of conservation significant fauna species and/or their habitat.

Three species of conservation significance were positively identified as utilising the subject site for some purpose during the course of the field survey (Forest Red-tailed Black Cockatoo, Carnaby's Black Cockatoo and Baudin's Black Cockatoo).

Based on habitats present, it has been determined that one additional species of conservation significance may possibly occur at times (Peregrine Falcon) but its current status on-site and/or in the general area is difficult to determine because it was not sighted during the survey period and no evidence of use of the subject site was found. This species is generally uncommon and only likely to occur in the subject site very occasionally and then only for brief periods.

The potential impact to conservation significant species from the proposed development will vary depending on their current degree of utilisation/population densities and preferred habitat requirements (e.g. quantity and quality of potential foraging habitat that will be affected when clearing of the site is undertaken).

The potential impacts on these species and/or their habitat should be taken into consideration during ongoing planning.

8. REFERENCES

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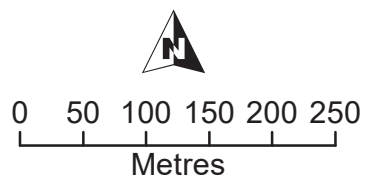
PGV Environmental (2018). *Flora and Vegetation Survey – Metronet Denny Avenue Level Crossing*.

FIGURES



Legend

 Subject Site



Drawn: G Harewood

Date: Dec 2018

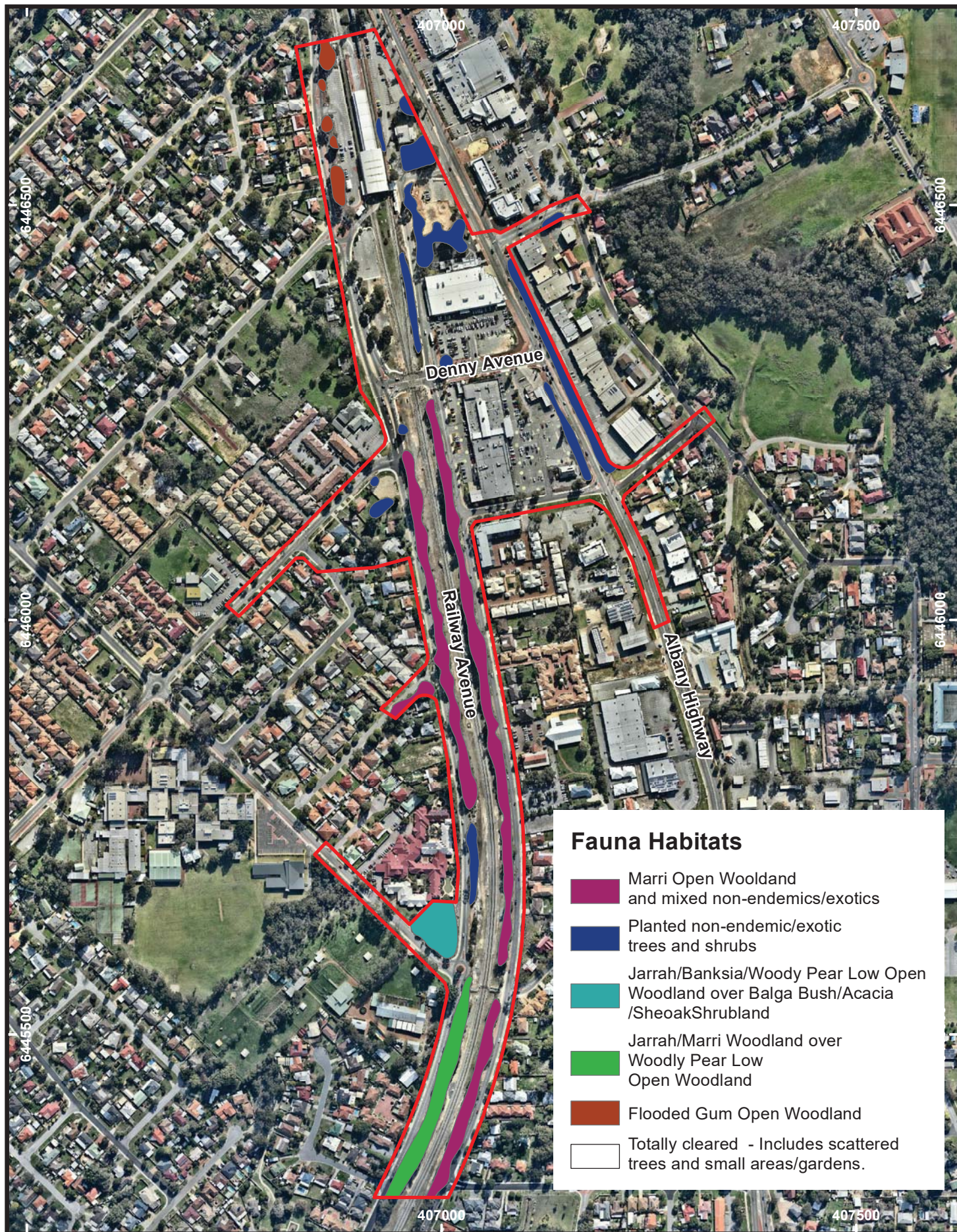
Scale: 1: 50,000

Projection/Coordinate System: UTM/MGA Zone 50

Denny Avenue
Level Crossing Removal Project
Public Transport Authority

**Aerial
Photograph**


Figure: 1

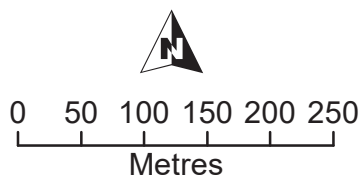


Fauna Habitats

-  Marri Open Woodland and mixed non-endemics/exotics
-  Planted non-endemic/exotic trees and shrubs
-  Jarrah/Banksia/Woody Pear Low Open Woodland over Balga Bush/Acacia/Sheoak Shrubland
-  Jarrah/Marri Woodland over Woody Pear Low Open Woodland
-  Flooded Gum Open Woodland
-  Totally cleared - Includes scattered trees and small areas/gardens.

Legend

-  Subject Site



Drawn: G Harewood
Date: Dec 2018
Scale: 1: 50,000

Projection/Coordinate System: UTM/MGA Zone 50

**Denny Avenue
Level Crossing Removal Project
Public Transport Authority**

Fauna Habitats

(Based on Vegetation Types
PGV 2018)

Figure: 2



Legend



Subject Site



Habitat Tree - One or more possible small/medium hollows



Habitat Tree - No hollows seen



Drawn: G Harewood

Date: Oct 2018

Scale: 1: 50,000

Projection/Coordinate System: UTM/MGA Zone 50


Denny Avenue
Level Crossing Removal Project
Public Transport Authority






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

Figure: 3



Legend

 Subject Site

-  Marri
-  Dead Unknown
-  Flooded Gum
-  Jarrah
-  Unknown Non-Endemic Eucalypt



Drawn: G Harewood

Date: Oct 2018

Scale: 1: 50,000

Projection/Coordinate System: UTM/MGA Zone 50

Denny Avenue
Level Crossing Removal Project
Public Transport Authority

Habitat Tree Species

Figure: 4

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 asterix are matters of national environmental significance (NES) under the *EPBC Act*.

Wildlife Conservation (Specially Protected Fauna) Notice 2017 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.
Schedule 2 (S2) Endangered species	EN	Threatened species considered to be facing a very high risk of extinction in the wild.
Schedule 3 (S3) Vulnerable species	VU	Threatened species considered to be facing a high risk of extinction in the wild.
Schedule 4 (S4) Presumed extinct species	EX	Species which have been adequately searched for and there is no reasonable doubt that the last individual has died.
Schedule 5 (S5) Migratory birds protected under an international agreement	IA	Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds.
Schedule 6 (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

DBCA & EPBC DATABASE SEARCH RESULTS

NatureMap - Denny Ave

Created By Greg Harewood on 29/09/2018

Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 116° 00' 51" E, 32° 07' 06" S
Buffer 10km
Group By Species Group

Species Group	Species	Records
Amphibian	13	396
Bird	242	53700
Fish	5	67
Invertebrate	210	1009
Mammal	34	641
Reptile	59	520
TOTAL	563	56333

Name ID	Species Name	Naturalised	Conservation Code	¹ 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.	25409 <i>Heleioporus barycragus</i> (Hooting Frog)			
7.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
8.	25412 <i>Heleioporus psammophilus</i> (Sand Frog)			
9.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
10.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
11.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
12.	25420 <i>Myobatrachus gouldii</i> (Turtle Frog)			
13.	25433 <i>Pseudophryne guentheri</i> (Crawling Toadlet)			
Bird				
14.	24559 <i>Acanthagenys rufogularis</i> (Spiny-cheeked Honeyeater)			
15.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
16.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
17.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
18.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
19.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
20.	24281 <i>Accipiter cirrocephalus</i> subsp. <i>cirrocephalus</i> (Collared Sparrowhawk)			
21.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
22.	24283 <i>Accipiter fasciatus</i> subsp. <i>didimus</i> (Brown Goshawk)			
23.	24282 <i>Accipiter fasciatus</i> subsp. <i>fasciatus</i> (Brown Goshawk)			
24.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
25.	24831 <i>Acrocephalus australis</i> subsp. <i>gouldi</i> (Australian Reed Warbler)			
26.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
27.	25544 <i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
28.	24301 <i>Aegotheles cristatus</i> subsp. <i>cristatus</i> (Australian Owlet-nightjar)			
29.	24310 <i>Anas castanea</i> (Chestnut Teal)			
30.	24312 <i>Anas gracilis</i> (Grey Teal)			
31.	<i>Anas platyrhynchos</i> subsp. <i>domesticus</i>			
32.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
33.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
34.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
35.	<i>Anser anser</i>			
36.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
37.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
38.	25554 <i>Apus pacificus</i> (Fork-tailed Swift, Pacific Swift)		IA	
39.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
40.	24337	<i>Ardea garzetta</i> subsp. <i>nigripes</i> (Little Egret)			
41.	25558	<i>Ardea ibis</i> (Cattle Egret)			
42.	41324	<i>Ardea modesta</i> (great egret, white egret)			
43.	24340	<i>Ardea novaehollandiae</i> (White-faced Heron)			
44.	24341	<i>Ardea pacifica</i> (White-necked Heron)			
45.	25736	<i>Arenaria interpres</i> (Ruddy Turnstone)		IA	
46.	25566	<i>Artamus cinereus</i> (Black-faced Woodswallow)			
47.	24352	<i>Artamus cinereus</i> subsp. <i>melanops</i> (Black-faced Woodswallow)			
48.	24353	<i>Artamus cyanopterus</i> (Dusky Woodswallow)			
49.	24356	<i>Artamus personatus</i> (Masked Woodswallow)			
50.		<i>Artamus sordidus</i>			
51.	24318	<i>Aythya australis</i> (Hardhead)			
52.		<i>Barnardius zonarius</i>			
53.	24319	<i>Biziura lobata</i> (Musk Duck)			
54.	24345	<i>Botaurus poiciloptilus</i> (Australasian Bittern)		T	
55.	24359	<i>Burhinus grallarius</i> (Bush Stone-curlew)			
56.	25713	<i>Cacatua galerita</i> (Sulphur-crested Cockatoo)			
57.	25714	<i>Cacatua pastinator</i> (Western Long-billed Corella)			
58.	25715	<i>Cacatua roseicapilla</i> (Galah)			
59.	25716	<i>Cacatua sanguinea</i> (Little Corella)			
60.	24729	<i>Cacatua tenuirostris</i> (Eastern Long-billed Corella)	Y		
61.	25598	<i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
62.	24427	<i>Cacomantis flabelliformis</i> subsp. <i>flabelliformis</i> (Fan-tailed Cuckoo)			
63.	42307	<i>Cacomantis pallidus</i> (Pallid Cuckoo)			
64.	24779	<i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
65.	24784	<i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
66.	24786	<i>Calidris melanotos</i> (Pectoral Sandpiper)		IA	
67.	24788	<i>Calidris ruficollis</i> (Red-necked Stint)		IA	
68.	24789	<i>Calidris subminuta</i> (Long-toed Stint)		IA	
69.	25717	<i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
70.	24731	<i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black Cockatoo)		T	
71.	24733	<i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)		T	
72.	24734	<i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)		T	
73.	48400	<i>Calyptorhynchus</i> sp. (white-tailed black cockatoo)		T	
74.	25575	<i>Charadrius leschenaultii</i> (Greater Sand Plover)		IA	
75.	24377	<i>Charadrius ruficapillus</i> (Red-capped Plover)			
76.	24321	<i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
77.	47909	<i>Cheramoeca leucosterna</i> (White-backed Swallow)			
78.		<i>Chroicocephalus novaehollandiae</i>			
79.	24432	<i>Chrysococcyx lucidus</i> subsp. <i>plagosus</i> (Shining Bronze Cuckoo)			
80.	24288	<i>Circus approximans</i> (Swamp Harrier)			
81.	24289	<i>Circus assimilis</i> (Spotted Harrier)			
82.	24774	<i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
83.	25675	<i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
84.	24399	<i>Columba livia</i> (Domestic Pigeon)	Y		
85.	25568	<i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
86.	24362	<i>Coracina novaehollandiae</i> subsp. <i>novaehollandiae</i> (Black-faced Cuckoo-shrike)			
87.	24416	<i>Corvus bennetti</i> (Little Crow)			
88.	25592	<i>Corvus coronoides</i> (Australian Raven)			
89.	24417	<i>Corvus coronoides</i> subsp. <i>perplexus</i> (Australian Raven)			
90.	24671	<i>Coturnix pectoralis</i> (Stubble Quail)			
91.	25701	<i>Coturnix ypsilophora</i> (Brown Quail)			
92.	24673	<i>Coturnix ypsilophora</i> subsp. <i>australis</i> (Brown Quail)			
93.	24420	<i>Cracticus nigrogularis</i> (Pied Butcherbird)			
94.	25595	<i>Cracticus tibicen</i> (Australian Magpie)			
95.	24423	<i>Cracticus tibicen</i> subsp. <i>tibicen</i> (Black-backed Magpie)			
96.	25596	<i>Cracticus torquatus</i> (Grey Butcherbird)			
97.	24424	<i>Cracticus torquatus</i> subsp. <i>torquatus</i> (Grey Butcherbird)			
98.	24322	<i>Cygnus atratus</i> (Black Swan)			
99.	24323	<i>Cygnus olor</i> (Mute Swan)	Y		
100.	30901	<i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
101.	25673	<i>Daphoenositta chrysoptera</i> (Varied Sittella)			
102.	25607	<i>Dicaeum hirundinaceum</i> (Mistletoebird)			
103.	24470	<i>Dromaius novaehollandiae</i> (Emu)			
104.		<i>Egretta garzetta</i>			
105.		<i>Egretta novaehollandiae</i>			
106.		<i>Elanus axillaris</i>			
107.	24290	<i>Elanus caeruleus</i> subsp. <i>axillaris</i> (Australian Black-shouldered Kite)			

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108.	47937	<i>Elseya melanops</i> (Black-fronted Dotterel)			
109.		<i>Eolophus roseicapillus</i>			
110.	25692	<i>Eopsaltria australis</i> (Yellow Robin)			
111.	24651	<i>Eopsaltria australis</i> subsp. <i>griseogularis</i> (Western Yellow Robin)			
112.	24652	<i>Eopsaltria georgiana</i> (White-breasted Robin)			
113.	24567	<i>Epthianura albifrons</i> (White-fronted Chat)			
114.	24379	<i>Erythronyctes alba</i> (Red-kneed Dotterel)			
115.	24368	<i>Eurostopodus argus</i> (Spotted Nightjar)			
116.	25621	<i>Falco berigora</i> (Brown Falcon)			
117.	25622	<i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
118.	24472	<i>Falco cenchroides</i> subsp. <i>cenchrus</i> (Australian Kestrel, Nankeen Kestrel)			
119.	25623	<i>Falco longipennis</i> (Australian Hobby)			
120.	24474	<i>Falco longipennis</i> subsp. <i>longipennis</i> (Australian Hobby)			
121.	25624	<i>Falco peregrinus</i> (Peregrine Falcon)		S	
122.	24475	<i>Falco peregrinus</i> subsp. <i>macropus</i> (Australian Peregrine Falcon)		S	
123.	25727	<i>Fulica atra</i> (Eurasian Coot)			
124.	24761	<i>Fulica atra</i> subsp. <i>australis</i> (Eurasian Coot)			
125.	25729	<i>Gallinula tenebrosa</i> (Dusky Moorhen)			
126.	24763	<i>Gallinula tenebrosa</i> subsp. <i>tenebrosa</i> (Dusky Moorhen)			
127.	25730	<i>Gallirallus philippensis</i> (Buff-banded Rail)			
128.	24765	<i>Gallirallus philippensis</i> subsp. <i>mellori</i> (Buff-banded Rail)			
129.		<i>Gallus gallus</i>			
130.	47954	<i>Gelochelidon nilotica</i> (Gull-billed Tern)		IA	
131.	25530	<i>Gerygone fusca</i> (Western Gerygone)			
132.	24271	<i>Gerygone fusca</i> subsp. <i>fusca</i> (Western Gerygone)			
133.	47962	<i>Glyciphila melanops</i> (Tawny-crowned Honeyeater)			
134.	24443	<i>Grallina cyanoleuca</i> (Magpie-lark)			
135.	24487	<i>Haematopus longirostris</i> (Pied Oystercatcher)			
136.	24293	<i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
137.	24295	<i>Haliastur spheerodes</i> (Whistling Kite)			
138.	47965	<i>Hieraaetus morphnoides</i> (Little Eagle)			
139.	25734	<i>Himantopus himantopus</i> (Black-winged Stilt)			
140.	24491	<i>Hirundo neoxena</i> (Welcome Swallow)			
141.	47975	<i>Ixobrychus dubius</i> (Australian Little Bittern)		P4	
142.	24511	<i>Larus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Silver Gull)			
143.	25661	<i>Lichmera indistincta</i> (Brown Honeyeater)			
144.	25741	<i>Limosa limosa</i> (Black-tailed Godwit)		IA	
145.	25683	<i>Lonchura castaneothorax</i> (Chestnut-breasted Mannikin)			
146.		<i>Lophoceros isura</i>			
147.	24326	<i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
148.	25650	<i>Malurus elegans</i> (Red-winged Fairy-wren)			
149.	25651	<i>Malurus lamberti</i> (Variegated Fairy-wren)			
150.	25652	<i>Malurus leucopterus</i> (White-winged Fairy-wren)			
151.	24551	<i>Malurus pulcherrimus</i> (Blue-breasted Fairy-wren)			
152.	25654	<i>Malurus splendens</i> (Splendid Fairy-wren)			
153.	24552	<i>Malurus splendens</i> subsp. <i>splendens</i> (Splendid Fairy-wren)			
154.	24583	<i>Manorina flavigula</i> (Yellow-throated Miner)			
155.	25758	<i>Megalurus gramineus</i> (Little Grassbird)			
156.	47997	<i>Melanodryas cucullata</i> (Hooded Robin)			
157.	25663	<i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
158.	24586	<i>Melithreptus brevirostris</i> subsp. <i>leucogenys</i> (Brown-headed Honeyeater)			
159.	24587	<i>Melithreptus chloropsis</i> (Western White-naped Honeyeater)			
160.	24736	<i>Melopsittacus undulatus</i> (Budgerigar)			
161.	24598	<i>Merops ornatus</i> (Rainbow Bee-eater)			
162.		<i>Microcarbo melanoleucos</i>			
163.	25693	<i>Microeca fascians</i> (Jacky Winter)			
164.	25542	<i>Milvus migrans</i> (Black Kite)			
165.	25610	<i>Myiagra inquieta</i> (Restless Flycatcher)			
166.	25686	<i>Neochmia temporalis</i> (Red-browed Finch)	Y		
167.	24738	<i>Neophema elegans</i> (Elegant Parrot)			
168.	25564	<i>Nycticorax caledonicus</i> (Rufous Night Heron)			
169.	24742	<i>Nymphicus hollandicus</i> (Cockatiel)			
170.	24407	<i>Ocyphaps lophotes</i> (Crested Pigeon)			
171.	24328	<i>Oxyura australis</i> (Blue-billed Duck)		P4	
172.	25680	<i>Pachycephala rufiventris</i> (Rufous Whistler)			
173.	24624	<i>Pachycephala rufiventris</i> subsp. <i>rufiventris</i> (Rufous Whistler)			
174.	48591	<i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
175.	25681	<i>Pardalotus punctatus</i> (Spotted Pardalote)			
176.	24625	<i>Pardalotus punctatus</i> subsp. <i>punctatus</i> (Spotted Pardalote)			
177.	25682	<i>Pardalotus striatus</i> (Striated Pardalote)			

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178.	24630	<i>Pardalotus striatus</i> subsp. <i>westraliensis</i> (Striated Pardalote)			
179.	24674	<i>Pavo cristatus</i> (Common Peafowl, Indian Peafowl)	Y		
180.	24648	<i>Pelecanus conspicillatus</i> (Australian Pelican)			
181.	48060	<i>Petrochelidon ariel</i> (Fairy Martin)			
182.	48061	<i>Petrochelidon nigricans</i> (Tree Martin)			
183.	48066	<i>Petroica boodang</i> (Scarlet Robin)			
184.	24659	<i>Petroica goodenovii</i> (Red-capped Robin)			
185.	25697	<i>Phalacrocorax carbo</i> (Great Cormorant)			
186.	25698	<i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
187.	24667	<i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
188.	25699	<i>Phalacrocorax varius</i> (Pied Cormorant)			
189.	24409	<i>Phaps chalcoptera</i> (Common Bronzewing)			
190.	25587	<i>Phaps elegans</i> (Brush Bronzewing)			
191.	48071	<i>Phylidonyris niger</i> (White-cheeked Honeyeater)			
192.	24596	<i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
193.	24841	<i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
194.	24842	<i>Platalea regia</i> (Royal Spoonbill)			
195.	25720	<i>Platycercus icterotis</i> (Western Rosella)			
196.	24745	<i>Platycercus icterotis</i> subsp. <i>icterotis</i> (Western Rosella)			
197.	24747	<i>Platycercus spurius</i> (Red-capped Parrot)			
198.	25721	<i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
199.	24750	<i>Platycercus zonarius</i> subsp. <i>semitorquatus</i> (Twenty-eight Parrot)			
200.	24751	<i>Platycercus zonarius</i> subsp. <i>zonarius</i> (Port Lincoln Parrot)			
201.	24843	<i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
202.	24382	<i>Pluvialis fulva</i> (Pacific Golden Plover)		IA	
203.	24383	<i>Pluvialis squatarola</i> (Grey Plover)		IA	
204.	25703	<i>Podargus strigoides</i> (Tawny Frogmouth)			
205.	24679	<i>Podargus strigoides</i> subsp. <i>brachypterus</i> (Tawny Frogmouth)			
206.	25704	<i>Podiceps cristatus</i> (Great Crested Grebe)			
207.	24681	<i>Polycephalus polycephalus</i> (Hoary-headed Grebe)			
208.	25722	<i>Polytelis anthopeplus</i> (Regent Parrot)			
209.	24683	<i>Pomatostomus superciliosus</i> (White-browed Babbler)			
210.	25731	<i>Porphyrio porphyrio</i> (Purple Swamphen)			
211.	24767	<i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)			
212.	24769	<i>Porzana fluminea</i> (Australian Spotted Crane)			
213.	25732	<i>Porzana pusilla</i> (Baillon's Crane)			
214.	24770	<i>Porzana pusilla</i> subsp. <i>palustris</i> (Baillon's Crane)			
215.	24771	<i>Porzana tabuensis</i> (Spotless Crane)			
216.	48085	<i>Psittacula krameri</i> (Indian Ringnecked Parrot, Rose-ringed Parakeet)	Y		
217.	24702	<i>Pterodroma brevirostris</i> (Kerguelen Petrel)			
218.	24703	<i>Pterodroma lessonii</i> (White-headed Petrel)			
219.	25710	<i>Pterodroma macroptera</i> (Great-winged Petrel)			
220.		<i>Purpureicephalus spurius</i>			
221.	24776	<i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
222.	48096	<i>Rhipidura albiscapa</i> (Grey Fantail)			
223.	25614	<i>Rhipidura leucophrys</i> (Willie Wagtail)			
224.	24454	<i>Rhipidura leucophrys</i> subsp. <i>leucophrys</i> (Willie Wagtail)			
225.	25534	<i>Sericornis frontalis</i> (White-browed Scrubwren)			
226.	24279	<i>Sericornis frontalis</i> subsp. <i>maculatus</i> (White-browed Scrubwren)			
227.	30948	<i>Smicromis brevirostris</i> (Weebill)			
228.	24645	<i>Stagonopleura oculata</i> (Red-eared Firetail)			
229.	24516	<i>Stercorarius longicaudus</i> (long-tailed jaeger, long-tailed skua)		IA	
230.	24329	<i>Stictonetta naevosa</i> (Freckled Duck)			
231.	25655	<i>Stipiturus malachurus</i> (Southern Emu-wren)			
232.	25597	<i>Strepera versicolor</i> (Grey Currawong)			
233.	25589	<i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
234.	30951	<i>Streptopelia chinensis</i> subsp. <i>tigrina</i> (Spotted Turtle-Dove)	Y		
235.	25590	<i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
236.	30950	<i>Streptopelia senegalensis</i> subsp. <i>senegalensis</i> (Laughing Turtle-Dove)	Y		
237.	25705	<i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
238.	24682	<i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
239.	24331	<i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
240.	24845	<i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
241.	25549	<i>Todiramphus sanctus</i> (Sacred Kingfisher)			
242.	24309	<i>Todiramphus sanctus</i> subsp. <i>sanctus</i> (Sacred Kingfisher)			
243.	48141	<i>Tribonyx ventralis</i> (Black-tailed Native-hen)			
244.	25723	<i>Trichoglossus haematodus</i> (Rainbow Lorikeet)			
245.	24755	<i>Trichoglossus haematodus</i> subsp. <i>moluccanus</i> (Rainbow Lorikeet)	Y		
246.	24806	<i>Tringa glareola</i> (Wood Sandpiper)		IA	

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247.	24808	<i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	
248.	24809	<i>Tringa stagnatilis</i> (Marsh Sandpiper, little greenshank)		IA	
249.	48147	<i>Turnix varius</i> (Painted Button-quail)			
250.	24851	<i>Turnix velox</i> (Little Button-quail)			
251.	24852	<i>Tyto alba</i> subsp. <i>delicatula</i> (Barn Owl)			
252.	25764	<i>Tyto novaehollandiae</i> (Masked Owl)			
253.	25577	<i>Vanellus miles</i> (Masked Lapwing)			
254.	24386	<i>Vanellus tricolor</i> (Banded Lapwing)			
255.	25765	<i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			

Fish

256.		<i>Bostockia porosa</i>			
257.	34028	<i>Galaxias occidentalis</i> (Western Minnow)			
258.		<i>Nannoperca vittata</i>			
259.		<i>Tandanus bostocki</i>			
260.		<i>Urocampus carinirostris</i>			

Invertebrate

261.		<i>Acariformes</i> sp.			
262.		<i>Adversaeschna brevistyla</i>			
263.		<i>Aeshnidae</i> sp.			
264.		<i>Aganippe raphiduca</i>			
265.		<i>Akamptogonus novarae</i>			
266.		<i>Amblyomma triguttatum</i>			
267.		<i>Aname mainae</i>			
268.		<i>Aname tepperi</i>			
269.		<i>Ancylidae</i> sp.			
270.		<i>Antiporus</i> sp.			
271.		<i>Arachnura higginsi</i>			
272.		<i>Araneus senicaudatus</i>			
273.		<i>Archaeosynthemis occidentalis</i>			
274.		<i>Archargiolestes pusillus</i>			
275.		<i>Argiope protensa</i>			
276.		<i>Argiope trifasciata</i>			
277.		<i>Arrenuridae</i> sp.			
278.		<i>Artoria flavimana</i>			
279.		<i>Artoria linnaei</i>			
280.		<i>Asadipus kunderang</i>			
281.		<i>Aturidae</i> sp.			
282.		<i>Austracantha minax</i>			
283.		<i>Austroagrion coeruleum</i>			
284.		<i>Austrochthonius muchmorei</i>			
285.	33971	<i>Austroconops mcmillani</i> (McMillan's biting midge (Swan Coastal Plain), biting midge (southwest))		P2	
286.		<i>Austrogomphus collaris</i>			
287.		<i>Backobourkia brounii</i>			
288.		<i>Backobourkia heroine</i>			
289.		<i>Badumna insignis</i>			
290.		<i>Baetidae</i> sp.			
291.		<i>Ballarra longipalpus</i>			
292.		<i>Caenidae</i> sp.			
293.		<i>Calanoida</i> sp.			
294.		<i>Celaenia excavata</i>			
295.		<i>Ceratopogonidae</i> sp.			
296.		<i>Cercophonius granulatus</i>			
297.		<i>Cercophonius sulcatus</i>			
298.		<i>Ceryderda cursitans</i>			
299.	33939	<i>Cherax cainii</i> (Marron)			
300.		<i>Cherax destructor</i>			
301.		<i>Cherax preissii</i>			
302.		<i>Cherax quinquecarinatus</i>			
303.		<i>Cherax</i> sp.			
304.		<i>Chironominae</i> sp.			
305.		<i>Chironomus</i> aff. <i>altmans</i> (V24) (CB)			
306.		<i>Chironomus tepperi</i>			
307.		<i>Cladocera</i> (unident.)			
308.		<i>Cladopelma curtivalva</i>			
309.		<i>Clynotis severus</i>			
310.		<i>Coenagrionidae</i> sp.			
311.		<i>Condoceris aptus</i>			
312.		<i>Corixidae</i> sp.			

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313.		<i>Cormocephalus aurantiipes</i>			
314.		<i>Cormocephalus turneri</i>			
315.		<i>Cricotopus 'parbicinctus'</i>			
316.		<i>Cyclosa trilobata</i>			
317.		<i>Cyrtophora parnasia</i>			
318.		<i>Demadiana cerula</i>			
319.		<i>Dicrotendipes</i> sp. A (V47) (SAP)			
320.		<i>Dingosa serrata</i>			
321.		<i>Dinocambala ingens</i>			
322.		<i>Dolichopodidae</i> sp.			
323.		<i>Dytiscidae</i> sp.			
324.		<i>Eriophora biapicata</i>			
325.		<i>Eriophora pustulosa</i>			
326.		<i>Eucyrtops latior</i>			
327.		<i>Eukoenenia mirabilis</i>			Y
328.	48579	<i>Euoplos inornatus</i> (inornate trapdoor spider (northern Jarrah Forest))		P3	
329.		<i>Eylaidae</i> sp.			
330.		<i>Geogarypus taylori</i>			
331.		<i>Glossiphoniidae</i> sp.			
332.		<i>Gomphidae</i> sp.			
333.		<i>Gripopterygidae</i> sp.			
334.		<i>Gyrinidae</i> sp.			
335.		<i>Harrisius</i> sp. A (SAP)			
336.		<i>Harrisius</i> sp. B (SFM)			
337.		<i>Hellyethira litua</i>			
338.		<i>Hellyethira</i> sp.			
339.		<i>Hemicordulia tau</i>			
340.		<i>Henicops dentatus</i>			
341.		<i>Holconia westralia</i>			
342.		<i>Hydrobiosidae</i> sp.			
343.		<i>Hydrometridae</i> sp.			
344.		<i>Hydrophilidae</i> sp.			
345.		<i>Hydropsychidae</i> sp.			
346.		<i>Hydroptilidae</i> sp.			
347.		<i>Hyriidae</i> sp.			
348.		<i>Idiommatia blackwalli</i>			
349.		<i>Isometroides vesus</i>			
350.		<i>Isopeda leishmanni</i>			
351.		<i>Ixodes australiensis</i>			
352.		<i>Kangarosa properipes</i>			
353.		<i>Karaops ellenae</i>			
354.	33980	<i>Kawaniphila pachomai</i> (Grey Vernal Katydid (southwest), cricket)		P1	
355.		<i>Kiefferulus intertinctus</i>			
356.		<i>Kiefferulus martini</i>			
357.		<i>Lampona brevipes</i>			
358.		<i>Lampona cylindrata</i>			
359.		<i>Lancetes lanceolatus</i>			
360.		<i>Lancetes</i> sp.			
361.		<i>Latrodectus hasseltii</i>			
362.	33982	<i>Leioproctus contrarius</i> (a short-tongued bee)		P3	
363.	33983	<i>Leioproctus douglasiellus</i> (a short-tongued bee)		T	
364.		<i>Leptoceridae</i> sp.			
365.		<i>Leptoperla australica</i>			
366.		<i>Leptophlebiidae</i> sp.			
367.		<i>Libellulidae</i> sp.			
368.		<i>Limnesiidae</i> sp.			
369.		<i>Limnoxenus</i> sp.			
370.		<i>Longrita insidiosa</i>			
371.		<i>Lycosa ariadnae</i>			
372.		<i>Macrogyrus angustatus</i>			
373.		<i>Maratus pavonis</i>			
374.		<i>Marsupiopus antechinus</i>			
375.		<i>Marsupiopus leporilli</i>			
376.		<i>Megapodagrionidae</i> sp.			
377.		<i>Megaporus solidus</i>			
378.		<i>Megaporus</i> sp.			
379.		<i>Micronecta robusta</i>			
380.		<i>Micronecta</i> sp.			
381.		<i>Miniargiolestes minimus</i>			
382.		<i>Missulena granulosa</i>			

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383.	<i>Missulena hoggi</i>			
384.	<i>Missulena occatoria</i>			
385.	<i>Mituliodon tarantulinus</i>			
386.	<i>Mitzoruga insularis</i>			
387.	<i>Naididae</i> sp.			
388.	<i>Necterosoma darwini</i>			
389.	<i>Necterosoma</i> sp.			
390.	<i>Nematoda</i> sp.			
391.	33984 <i>Neopasiphae simplicior</i> (a short-tongued bee)		T	
392.	<i>Nephila edulis</i>			
393.	<i>Nicodamus mainae</i>			
394.	<i>Notalina spira</i>			
395.	<i>Notonectidae</i> sp.			
396.	<i>Notoperata</i> sp. AV1 (SFM)			
397.	<i>Nunciella aspera</i>			
398.	<i>Occiperipatoides gilesii</i>			
399.	<i>Ocrisoma leucocomis</i>			
400.	<i>Offadens soror</i> (ex genus 1 WA sp. 1)			
401.	<i>Oligochaeta</i> sp.			
402.	<i>Ommatoiulus moreleti</i>			
403.	<i>Ommatoiulus moreletii</i>			
404.	<i>Oribatida</i> sp.			
405.	<i>Orthetrum caledonicum</i>			
406.	<i>Orthocladinae</i> 'woodminer' (SAP)			
407.	<i>Orthocladinae</i> sp.			
408.	<i>Ostracoda</i> (unident.)			
409.	<i>Oxidae</i> sp.			
410.	<i>Oxidus gracilis</i>			
411.	<i>Oxyethira</i> sp.			
412.	<i>Oxyopes gracilipes</i>			
413.	<i>Oxyopes punctatus</i>			
414.	<i>Palaemonidae</i> sp.			
415.	<i>Parachironomus</i> sp. 1 (VSCL35) (SAP)			
416.	<i>Paracladopelma</i> M1 (SFM)			
417.	<i>Parakiefferiella</i> sp. S1			
418.	<i>Paralampona marangaroo</i>			
419.	<i>Paralimnophyes pullulus</i> (V42)			
420.	<i>Paramerina levidensis</i>			
421.	<i>Parastacidae</i> sp.			
422.	<i>Pentaneurini</i> genus V20			
423.	<i>Physidae</i> sp.			
424.	<i>Planorbidae</i> sp.			
425.	<i>Platynectes</i> sp.			
426.	<i>Poltys laciniosus</i>			
427.	<i>Polygonarea repanda</i>			Y
428.	<i>Polypedium</i> nr. <i>convexum</i> (SAP)			
429.	<i>Procladius paludicola</i>			
430.	<i>Procladius villosimanus</i>			
431.	<i>Raveniella cirrata</i>			
432.	<i>Rhantus suturalis</i>			
433.	<i>Rheotanytarsus</i> sp. (SFM)			
434.	<i>Richardsonianidae</i> sp.			
435.	<i>Riethia</i> v4			
436.	<i>Scirtidae</i> sp.			
437.	<i>Scolopendra laeta</i>			
438.	<i>Scolopendra morsitans</i>			
439.	<i>Simuliidae</i> sp.			
440.	<i>Sphaerotrichopus ramosus</i>			
441.	<i>Steatoda grossa</i>			
442.	<i>Sternopriscus browni</i>			
443.	<i>Sternopriscus marginatus</i>			
444.	<i>Sternopriscus</i> sp.			
445.	<i>Storena formosa</i>			
446.	<i>Storosa tetrica</i>			
447.	<i>Stylopaupoides wungongensis</i>			Y
448.	<i>Supunna funerea</i>			
449.	<i>Supunna picta</i>			
450.	<i>Synothele durokoppin</i>			
451.	<i>Tabanidae</i> sp.			
452.	<i>Tanypodinae</i> sp.			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
453.	<i>Tanytarsus aff manleyensis</i>			
454.	<i>Tanytarsus fuscithorax/semibarbitarsus</i>			
455.	<i>Tanytarsus nr K5</i>			
456.	<i>Tanytarsus palmatus</i>			
457.	<i>Tasmanicosa leuckartii</i>			
458.	<i>Tasmanocoenis tillyardi</i>			
459.	<i>Thienemanniella</i> sp. (V19) (SAP)			
460.	<i>Tipulidae</i> sp.			
461.	<i>Triplectides australis</i>			
462.	<i>Triplectides</i> sp. AV21 (SFM)			
463.	<i>Urodacus novaehollandiae</i>			
464.	<i>Urodacus planimanus</i>			
465.	<i>Urodacus woodwardii</i>			
466.	<i>Veliidae</i> sp.			
467.	<i>Venator immansueta</i>			
468.	<i>Venatrix arenaris</i>			
469.	34113 <i>Westralunio carteri</i> (Carter's Freshwater Mussel)		T	
470.	<i>Withius piger</i>			

Mammal

471.	25449	<i>Antechinus flavipes</i> (Yellow-footed Antechinus)		
472.	24088	<i>Antechinus flavipes</i> subsp. <i>leucogaster</i> (Yellow-footed Antechinus, Mardo)		
473.	24162	<i>Bettongia penicillata</i> subsp. <i>ogilbyi</i> (Woylie, Brush-tailed Bettong)		T
474.	25454	<i>Canis lupus</i> (Dog, Dingo)	Y	
475.	30883	<i>Canis lupus</i> subsp. <i>familiaris</i> (Dog)	Y	
476.	24086	<i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)		
477.	24186	<i>Chalinolobus gouldii</i> (Gould's Wattled Bat)		
478.	24187	<i>Chalinolobus morio</i> (Chocolate Wattled Bat)		
479.	24092	<i>Dasyurus geoffroyi</i> (Chuditch, Western Quoll)		T
480.	24189	<i>Falsistrellus mackenziei</i> (Western False Pipistrelle, Western Falsistrelle)		P4
481.	24041	<i>Felis catus</i> (Cat)	Y	
482.	30916	<i>Funambulus pennanti</i> (Indian Palm Squirrel)	Y	
483.	24215	<i>Hydromys chrysogaster</i> (Water-rat, Rakali)		P4
484.	48588	<i>Isodon fusciventer</i> (Quenda, southwestern brown bandicoot)		P4
485.	24132	<i>Macropus fuliginosus</i> (Western Grey Kangaroo)		
486.	24223	<i>Mus musculus</i> (House Mouse)	Y	
487.	24146	<i>Myrmecobius fasciatus</i> (Numbat, Walpurti)		T
488.	48022	<i>Notamacropus irma</i> (Western Brush Wallaby)		P4
489.	24194	<i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)		
490.	24195	<i>Nyctophilus gouldi</i> (Gould's Long-eared Bat)		
491.	41424	<i>Nyctophilus major</i> (Greater Long-eared Bat)		
492.	24085	<i>Oryctolagus cuniculus</i> (Rabbit)	Y	
493.	48070	<i>Phascogale tapoatafa</i> subsp. <i>wambenger</i> (South-western Brush-tailed Phascogale, Wambenger)		S
494.	24173	<i>Pteropus scapulatus</i> (Little Red Flying-fox)		
495.	24245	<i>Rattus rattus</i> (Black Rat)	Y	
496.	24145	<i>Setonix brachyurus</i> (Quokka)		T
497.	24111	<i>Sminthopsis gilberti</i> (Gilbert's Dunnart)		
498.		<i>Sminthopsis murina</i>		
499.	24207	<i>Tachyglossus aculeatus</i> (Short-beaked Echidna)		
500.	24167	<i>Tarsipes rostratus</i> (Honey Possum, Noolbenger)		
501.	25521	<i>Trichosurus vulpecula</i> (Common Brushtail Possum)		
502.	24158	<i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum)		
503.	24206	<i>Vespadelus regulus</i> (Southern Forest Bat)		
504.	24040	<i>Vulpes vulpes</i> (Red Fox)	Y	

Reptile

505.	25242	<i>Acanthophis antarcticus</i> (Southern Death Adder)		P3
506.	42368	<i>Acritoscincus trilineatus</i> (Western Three-lined Skink)		
507.	25241	<i>Antaresia stimsoni</i> subsp. <i>stimsoni</i> (Stimson's Python)		
508.	24990	<i>Aprasia pulchella</i> (Granite Worm-lizard)		
509.	24991	<i>Aprasia repens</i> (Sand-plain Worm-lizard)		
510.	42381	<i>Brachyurophis semifasciatus</i> (Southern Shovel-nosed Snake)		
511.	43380	<i>Chelodina colliei</i> (South-western Snake-necked Turtle)		
512.	24980	<i>Christinus marmoratus</i> (Marbled Gecko)		
513.	24918	<i>Crenadactylus ocellatus</i> subsp. <i>ocellatus</i> (Clawless Gecko)		
514.	30893	<i>Cryptoblepharus buchananii</i>		
515.	25020	<i>Cryptoblepharus plagiocephalus</i>		
516.	30899	<i>Ctenophorus adalaidensis</i> (Southern Heath Dragon, Western Heath Dragon)		
517.	24883	<i>Ctenophorus ornatus</i> (Ornate Crevice-Dragon)		
518.	25027	<i>Ctenotus australis</i>		

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
519.	25035	<i>Ctenotus delli</i> (Dell's skink, Darling Range southwest Ctenotus)		P4	
520.	25039	<i>Ctenotus fallens</i>			
521.	25047	<i>Ctenotus impar</i>			
522.	25049	<i>Ctenotus labillardieri</i>			
523.	41641	<i>Ctenotus ora</i> (Coastal Plains Skink)		P3	
524.	25766	<i>Delma fraseri</i> (Fraser's Legless Lizard)			
525.	24999	<i>Delma grayii</i>			
526.	25296	<i>Demansia psammophis</i> subsp. <i>reticulata</i> (Yellow-faced Whipsnake)			
527.	24929	<i>Diplodactylus granariensis</i> subsp. <i>granariensis</i>			
528.	24939	<i>Diplodactylus polyophthalmus</i>			
529.	24940	<i>Diplodactylus pulcher</i>			
530.	25251	<i>Echiopsis curta</i> (Bardick)			
531.	25096	<i>Egernia kingii</i> (King's Skink)			
532.	25100	<i>Egernia napoleonis</i>			
533.	25250	<i>Elapognathus coronatus</i> (Crowned Snake)			
534.	24959	<i>Gehyra variegata</i>			
535.	25115	<i>Hemiergis initialis</i> subsp. <i>initialis</i>			
536.	25119	<i>Hemiergis quadrilineata</i>			
537.	25131	<i>Lerista distinguenda</i>			
538.	25133	<i>Lerista elegans</i>			
539.	25147	<i>Lerista lineata</i> (Perth Slider, Lined Skink)		P3	
540.	25005	<i>Lialis burtonis</i>			
541.	25184	<i>Menetia greyii</i>			
542.	25240	<i>Morelia spilota</i> subsp. <i>imbricata</i> (Carpet Python)			
543.	25191	<i>Morethia lineocellata</i>			
544.	25192	<i>Morethia obscura</i>			
545.	25248	<i>Neelaps bimaculatus</i> (Black-naped Snake)			
546.	25252	<i>Notechis scutatus</i> (Tiger Snake)			
547.	25253	<i>Parasuta gouldii</i>			
548.	25255	<i>Parasuta nigriceps</i>			
549.	25007	<i>Pletholax gracilis</i> subsp. <i>gracilis</i> (Keeled Legless Lizard)			
550.	24907	<i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
551.	25261	<i>Pseudechis australis</i> (Mulga Snake)			
552.	25511	<i>Pseudonaja affinis</i> (Dugite)			
553.	25259	<i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
554.	42416	<i>Pseudonaja mengdeni</i> (Western Brown Snake)			
555.	25008	<i>Pygopus lepidopodus</i> (Common Scaly Foot)			
556.	25266	<i>Simoselaps bertholdi</i> (Jan's Banded Snake)			
557.	24943	<i>Strophurus spinigerus</i> subsp. <i>inornatus</i>			
558.	25203	<i>Tiliqua occipitalis</i> (Western Bluetongue)			
559.	25519	<i>Tiliqua rugosa</i>			
560.	25207	<i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			
561.	24983	<i>Underwoodisaurus milii</i> (Barking Gecko)			
562.	25225	<i>Varanus rosenbergi</i> (Heath Monitor)			
563.	25526	<i>Varanus tristis</i> (Racehorse Monitor)			

Conservation Codes

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

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



EPBC Act Protected Matters Report

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

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

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

Report created: 29/09/18 15:20:28

[Summary](#)

[Details](#)

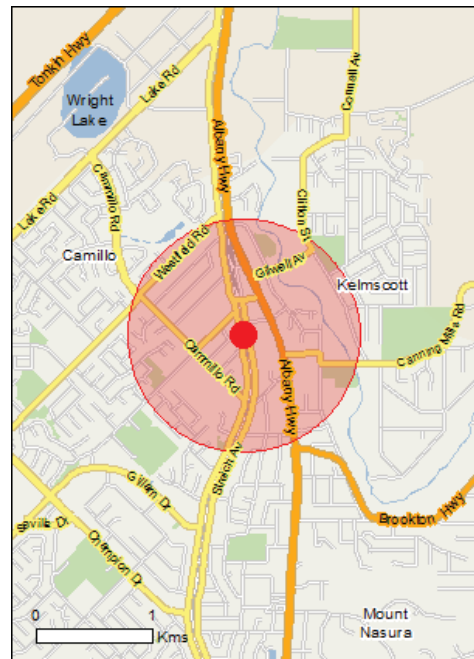
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

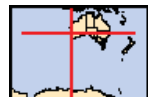
[Acknowledgements](#)



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

Buffer: 1.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	26
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:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	14
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:	None
Invasive Species:	32
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Forrestdale and thomsons lakes	Within 10km of Ramsar

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

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

Listed Threatened Species	[Resource Information]
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Name	Status	Type of Presence
Birds		

Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area

Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area

Calyptorhynchus banksii naso		
Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area

Calyptorhynchus baudinii		
Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Endangered	Roosting known to occur within area

Calyptorhynchus latirostris		
Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area

Leipoa ocellata		
Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area

Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Rostratula australis		
Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area

Mammals		
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Bettongia penicillata ogilbyi		
Woylie [66844]	Endangered	Species or species habitat likely to occur within area

Dasyurus geoffroii		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat may occur within area
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat likely to occur within area
Other		
Westralunio carteri Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat may occur within area
Plants		
Anthocercis gracilis Slender Tailflower [11103]	Vulnerable	Species or species habitat may occur within area
Calytrix breviseta subsp. breviseta Swamp Starflower [23879]	Endangered	Species or species habitat may occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat likely to occur within area
Drakaea elastica Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus x balanites Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat may occur within area
Goodenia arthrotricha [12448]	Endangered	Species or species habitat may occur within area
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	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 likely to occur within area
Synaphea sp. Serpentine (G.R. Brand 103) [86879]	Critically Endangered	Species or species habitat may occur within area
Thelymitra stellata Star Sun-orchid [7060]	Endangered	Species or species habitat likely to occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		

Name	Threatened	Type of Presence
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata 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
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

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

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

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
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
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

Invasive Species [Resource Information]

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

Name	Status	Type of Presence
Birds		
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within

Name	Status	Type of Presence area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large- leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area

Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-32.11823 116.01426

Acknowledgements

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

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

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

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

APPENDIX C

OBSERVED FAUNA LISTING

Fauna Observed During Survey Period

Denning Avenue

Compiled by Greg Harewood - Oct 2018

Class Family Species	Common Name	Conservation Status
Aves		
Psittacidae Parrots		
<i>Cacatua roseicapilla</i>	Galah	LC
<i>Cacatua sanguinea</i>	Little Corella	LC
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo	S3 VU Bp LC
<i>Calyptorhynchus baudinii</i>	Baudin's Black Cockatoo	S2 EN Bp EN A3cde
<i>Calyptorhynchus latirostris</i>	Carnaby's Black Cockatoo	S2 EN Bp EN A2bcde
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Introduced
Acanthizidae Thornbills, Geryones, Fieldwrens & Whitefaces		
<i>Smicrornis brevirostris</i>	Weebill	LC
Meliphagidae Honeyeaters, Chats		
<i>Anthochaera carunculata</i>	Red Wattlebird	LC
<i>Lichenostomus virescens</i>	Singing Honeyeater	LC
<i>Lichmera indistincta</i>	Brown Honeyeater	LC
Dicruridae Monarchs, Magpie Lark, Flycatchers, Fantails, Drongo		
<i>Grallina cyanoleuca</i>	Magpie-lark	LC
Corvidae Ravens, Crows		
<i>Corvus coronoides</i>	Australian Raven	LC

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

APPENDIX D

HABITAT TREE DETAILS

Habitat Trees

DBH >50cm

Datum - GDA94

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

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range	Occupancy	Potential Cockatoo Nest Hollow	Comments
wpt001	50H	406965	6446074	Unknown Euc	0-5	>50	0		No Signs	No	
wpt002	50H	406950	6445893	Marri	20+	>50	0		No Signs	No	
wpt009	50H	406955	6445898	Marri	20+	>50	0		No Signs	No	
wpt056	50H	406984	6445912	Marri	15-20	>50	0		No Signs	No	
wpt057	50H	407017	6445755	Marri	20+	>50	0		No Signs	No	
wpt058	50H	406995	6445612	Jarrah	10-15	>50	0		No Signs	No	
wpt059	50H	406916	6445653	Unknown Euc	20+	>50	0		No Signs	No	
wpt060	50H	406920	6445647	Unknown Euc	20+	>50	0		No Signs	No	
wpt061	50H	406922	6445645	Unknown Euc	20+	>50	0		No Signs	No	
wpt062	50H	406928	6445640	Unknown Euc	20+	>50	0		No Signs	No	
wpt063	50H	406932	6445636	Unknown Euc	20+	>50	0		No Signs	No	
wpt064	50H	406943	6445626	Unknown Euc	20+	>50	0		No Signs	No	
wpt065	50H	406959	6445610	Unknown Euc	15-20	>50	0		No Signs	No	
wpt066	50H	406977	6445591	Unknown Euc	15-20	>50	0		No Signs	No	
wpt067	50H	406981	6445588	Unknown Euc	20+	>50	0		No Signs	No	
wpt068	50H	406989	6445583	Unknown Euc	20+	>50	0		No Signs	No	
wpt069	50H	406991	6445579	Unknown Euc	20+	>50	0		No Signs	No	
wpt070	50H	406956	6445337	Marri	20+	>50	0		No Signs	No	
wpt071	50H	406962	6445349	Unknown Euc	15-20	>50	0		No Signs	No	
wpt072	50H	406968	6445357	Unknown Euc	15-20	>50	0		No Signs	No	
wpt073	50H	406973	6445367	Marri	10-15	>50	0		No Signs	No	
wpt074	50H	406972	6445373	Marri	20+	>50	0		No Signs	No	
wpt075	50H	406998	6445435	Jarrah	15-20	>50	0		No Signs	No	
wpt076	50H	407002	6445457	Jarrah	5-10	>50	2+	Small, Medium & Large	Bees	No	Internal dimensions of hollow unknown
wpt077	50H	407011	6445493	Jarrah	15-20	>50	0		No Signs	No	
wpt078	50H	407021	6445528	Jarrah	15-20	>50	0		No Signs	No	
wpt079	50H	407035	6445735	Marri	15-20	>50	0		No Signs	No	
wpt080	50H	407034	6445785	Marri	15-20	>50	0		No Signs	No	
wpt081	50H	407035	6445807	Marri	15-20	>50	0		No Signs	No	
wpt082	50H	407032	6445810	Marri	15-20	>50	0		No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrnace Size Range	Occupancy	Potential Cockatoo Nest Hollow	Comments
wpt083	50H	407029	6445828	Dead Marri	15-20	>50	2+	Small & Medium	No Signs	No	Internal dimensions of hollow unknown
wpt084	50H	407019	6445864	Marri	15-20	>50	0		No Signs	No	
wpt085	50H	407015	6445883	Marri	20+	>50	0		No Signs	No	
wpt086	50H	407005	6445923	Marri	15-20	>50	0		No Signs	No	
wpt087	50H	407003	6445944	Marri	15-20	>50	0		No Signs	No	
wpt088	50H	407001	6445948	Marri	20+	>50	0		No Signs	No	
wpt089	50H	407006	6445957	Jarrah	15-20	>50	0		No Signs	No	
wpt090	50H	407001	6445970	Marri	15-20	>50	0		No Signs	No	
wpt091	50H	406996	6445999	Marri	15-20	>50	0		No Signs	No	
wpt092	50H	406990	6446026	Marri	15-20	>50	0		No Signs	No	
wpt093	50H	406968	6446136	Marri	15-20	>50	0		No Signs	No	
wpt094	50H	406969	6446143	Marri	15-20	>50	0		No Signs	No	
wpt095	50H	406969	6446143	Marri	15-20	>50	0		No Signs	No	
wpt096	50H	406959	6446194	Marri	15-20	>50	0		No Signs	No	
wpt097	50H	407008	6446167	Marri	20+	>50	0		No Signs	No	
wpt098	50H	407011	6446150	Marri	15-20	>50	0		No Signs	No	
wpt099	50H	407015	6446123	Marri	20+	>50	0		No Signs	No	Ravens Nest in tree
wpt100	50H	407016	6446113	Marri	20+	>50	0		No Signs	No	
wpt101	50H	407017	6446103	Unknown Euc	15-20	>50	0		No Signs	No	
wpt102	50H	407031	6446035	Marri	15-20	>50	0		No Signs	No	
wpt103	50H	407039	6446013	Marri	20+	>50	0		No Signs	No	
wpt104	50H	407039	6445992	Marri	15-20	>50	0		No Signs	No	
wpt105	50H	407042	6445987	Marri	15-20	>50	0		No Signs	No	
wpt106	50H	407043	6445985	Marri	15-20	>50	0		No Signs	No	
wpt107	50H	407047	6445979	Marri	20+	>50	0		No Signs	No	
wpt108	50H	407047	6445970	Marri	20+	>50	0		No Signs	No	
wpt109	50H	407044	6445970	Marri	20+	>50	0		No Signs	No	
wpt110	50H	407051	6445946	Marri	15-20	>50	0		No Signs	No	
wpt111	50H	407062	6445883	Marri	20+	>50	0		No Signs	No	
wpt112	50H	407065	6445873	Marri	15-20	>50	0		No Signs	No	
wpt113	50H	407062	6445869	Jarrah	15-20	>50	0		No Signs	No	
wpt114	50H	407066	6445852	Marri	15-20	>50	0		No Signs	No	
wpt115	50H	407073	6445835	Marri	15-20	>50	0		No Signs	No	
wpt116	50H	407074	6445814	Marri	15-20	>50	0		No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrnace Size Range	Occupancy	Potential Cockatoo Nest Hollow	Comments
wpt117	50H	407077	6445793	Marri	15-20	>50	0		No Signs	No	
wpt118	50H	407084	6445722	Marri	15-20	>50	0		No Signs	No	
wpt119	50H	407086	6445698	Unknown Euc	15-20	>50	0		No Signs	No	
wpt120	50H	407082	6445620	Unknown Euc	15-20	>50	0		No Signs	No	
wpt121	50H	407077	6445595	Unknown Euc	15-20	>50	0		No Signs	No	
wpt122	50H	407060	6445493	Jarrah	15-20	>50	0		No Signs	No	
wpt123	50H	407031	6445404	Unknown Euc	15-20	>50	0		No Signs	No	
wpt124	50H	407021	6445374	Jarrah	15-20	>50	0		No Signs	No	
wpt125	50H	407017	6445369	Marri	15-20	>50	0		No Signs	No	
wpt126	50H	407004	6445326	Marri	15-20	>50	0		No Signs	No	
wpt127	50H	407089	6446141	Flooded Gum	20+	>50	0		No Signs	No	
wpt128	50H	407165	6446161	Marri	15-20	>50	0		No Signs	No	
wpt129	50H	407002	6446312	Unknown Euc	20+	>50	0		No Signs	No	
wpt130	50H	407030	6446481	Marri	15-20	>50	1	Small & Medium	Bees	No	Rainbow Lorikeets inspecting hollow
wpt131	50H	407025	6446481	Marri	20+	>50	0		No Signs	No	
wpt132	50H	407022	6446472	Marri	20+	>50	0		No Signs	No	
wpt133	50H	407001	6446467	Unknown Euc	15-20	>50	0		No Signs	No	
wpt134	50H	406991	6446459	Marri	20+	>50	0		No Signs	No	
wpt135	50H	406985	6446436	Unknown Euc	20+	>50	0		No Signs	No	
wpt136	50H	406977	6446451	Marri	15-20	>50	0		No Signs	No	
wpt137	50H	406971	6446486	Dead Unknown	0-5	>50	2+	Small	No Signs	No	Internal dimensions of hollow unknown
wpt138	50H	406962	6446499	Unknown Euc	15-20	>50	0		No Signs	No	
wpt139	50H	406942	6446533	Marri	15-20	>50	0		No Signs	No	
wpt140	50H	406984	6446556	Unknown Euc	20+	>50	0		No Signs	No	
wpt141	50H	406969	6446577	Unknown Euc	15-20	>50	0		No Signs	No	
wpt142	50H	406950	6446615	Unknown Euc	15-20	>50	0		No Signs	No	
wpt143	50H	406860	6446669	Marri	15-20	>50	0		No Signs	No	
wpt144	50H	406861	6446665	Marri	15-20	>50	0		No Signs	No	
wpt145	50H	406862	6446598	Unknown Euc	20+	>50	0		No Signs	No	
wpt146	50H	406874	6446537	Flooded Gum	15-20	>50	0		No Signs	No	
wpt147	50H	406874	6446530	Flooded Gum	15-20	>50	0		No Signs	No	
wpt148	50H	406875	6446519	Flooded Gum	15-20	>50	0		No Signs	No	
wpt149	50H	406875	6446518	Flooded Gum	15-20	>50	0		No Signs	No	
wpt150	50H	406877	6446517	Flooded Gum	15-20	>50	0		No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size Range	Occupancy	Potential Cockatoo Nest Hollow	Comments
wpt151	50H	406878	6446502	Flooded Gum	15-20	>50	0		No Signs	No	
wpt152	50H	406880	6446502	Flooded Gum	15-20	>50	0		No Signs	No	
wpt153	50H	406894	6446424	Marri	15-20	>50	0		No Signs	No	
wpt154	50H	406931	6446346	Marri	15-20	>50	0		No Signs	No	
wpt155	50H	407308	6446223	Flooded Gum	15-20	>50	0		No Signs	No	
wpt156	50H	407310	6446228	Unknown Euc	15-20	>50	0		No Signs	No	

DISCLAIMER

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

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

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

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