

# Fauna Assessment



## West Piara Waters

## Forrestdale

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Version 2

***On behalf of:***

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**Acronyms/Abbreviations:**

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

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

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

**°C:** Degrees Celsius.

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

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

**CBD:** Central Business District.

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

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

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

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

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

**DER:** Department of Environment Regulation (now DWER), WA Government.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**km:** Kilometre.

**m:** Metre.

**MKSEA:** Maddington Kenwick Strategic Employment Area.

**mm:** Millimetre.

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

**POS:** Public Open Space.

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

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

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

**SRE:** Short Range Endemic.

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

**WA:** Western Australia.

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

**WAPC:** Western Australian Planning Commission, WA Government.

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

## SUMMARY

This report details the results of a fauna assessment of various freehold allotments within and area of land referred to as West Piara Waters located in the City of Armadale (subject site). The subject site covers approximately 124 ha, most of which is cleared or parkland cleared though some areas of remnant native vegetation remain (Figures 1 & 2).

It is understood that outline development plans are being prepared to support future development across the subject site. A range of investigations, including this fauna survey, have been undertaken in order to fully understand the suite of environmental values across the area.

The scope of works was to conduct a level 1 fauna survey as defined by the Environmental Protection Authority (EPA 2016). Because black cockatoos are known to frequent the area a targeted assessment of the sites significance to these species has also been carried out. The assessment has therefore included a literature review (“desktop study”) and several daytime reconnaissance surveys.

Remnant native vegetation within the subject site (28% of the total area) is now mainly represented by wetland vegetation dominated by paperbark and/or flooded gum low forests or woodland over native understorey, herblands, sedgeland, introduced weeds or grasslands (~21.3% of the total area). A small number of manmade dams and drains, some with a coverage of *Typha orientalis* are also present.

Remnant upland vegetation is present as small groves of woodland/forest comprised of tree species in various densities and combinations including banksia, sheoak, coastal blackbutt and jarrah over native understorey, introduced weeds and/or grasslands (~6.7% of the subject site)

The balance of the subject site (~72.00% of the total area) is either totally cleared or parkland cleared with scattered trees, mostly planted non-endemic eucalyptus species, with a small number of endemics, some of which have also been planted (e.g. tuarts).

Overall fauna habitat values at the subject site have been severely compromised by the removal of most of the original native vegetation and the degradation of remnant patches. Most areas lack any natural attributes and are now only utilised by generally common and widespread fauna species with non-specific requirements which allow them to persist in disturbed/highly disturbed habitats. As a consequence, the fauna diversity of the subject site is well below levels present prior to historical disturbances having occurred.

Despite the lack of biodiversity the site still retains some value for a small number of species of conservation significance, in particular black cockatoos (foraging and roosting opportunities) and the quenda though the groves of remnant vegetation present are limited in extent, fragmented, generally in a degraded condition and subject to ongoing decline.

The black cockatoo habitat tree assessment identified a total of 181 trees with a DBH of  $\geq 50$ cms within the subject site. The majority of these trees (164, 90.6%) are planted non-endemic eucalypts. It is not known if these tree species have the propensity to develop hollows for black cockatoos.

No trees were identified as potentially containing hollows of any size. Additional details on each habitat tree observed can be found in Appendix D.

Foraging debris (all in the form of chewed blackbutt and sheoak fruits) left by black cockatoos was observed at a small number of locations within the subject site during the survey period. This foraging activity was attributed to the forest red-tailed black cockatoo but some (chewed blackbutt fruits) may have been caused by Carnaby's as they also utilise this resource.

It is difficult to calculate the actual extent of quality natural foraging habitat within the subject site given it is largely comprised of patchy, fragmented vegetation of variable quality, but it is unlikely to total more than about 8.2 ha (i.e. areas mapped as containing *banksia* – see Figure 3).

No black cockatoo roosting activity within the subject site was noted during the survey period.

Based on available vegetation mapping it is estimated that there is approximately 11,500 ha of native vegetation within 12 km the subject site (~22% of total area) much of which is likely to represent black cockatoo habitat of some type. Bush forever sites make up about 75% of this area of remnant vegetation.

Opportunistic fauna observations are listed in Appendix B. A total of 29 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the subject site during the survey period. Five introduced species (horse, red fox, rabbit, laughing turtle dove, rainbow lorikeet) were also recorded.

Most of the fauna species recorded were common, widespread bird species.

Only one fauna species of conservation significance was recorded during the survey period (the forest red-tailed black cockatoo – foraging evidence).

With respect to native vertebrate fauna, 9 mammals (includes eight bat species), 118 bird, 20 reptile, and nine frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the subject site at times, a conclusion largely based on the presence of apparently suitable habitat.

Of the 156 native animals that are listed as potentially occurring in the area, four are considered to be endangered/vulnerable or in need of special protection under State and/or Commonwealth legislation, these being the three species of black cockatoo and the peregrine falcon. In addition, the Priority 4 quenda and Perth lined lerista may also occur, given the presence of some suitable habitat for both species.



With respect to vertebrate fauna in general, no significant impacts are anticipated as a consequence of development at the site taking place. In cases where some impact is anticipated, the degree of the impact is only expected to be low and relates to the loss of small areas of fragmented and largely degraded habitat. As most species are common and widespread no overall change in their conservation status is anticipated, despite a possible localised reduction in habitat extent.

Based on available information it is considered, at this stage, very unlikely that impacts on black cockatoos (or any other *EPBC Act* listed threatened or migratory species) which may occur as a result of development at any scale within the subject site will be of a scale considered “significant impact” as defined by the Commonwealth DotEE (DotE 2013). The conclusions drawn with respect to this matter should be reviewed once development plans are finalised.

Subject to the proposal going forward it is recommended that a fauna management plan be prepared for implementation during initial site works with the aim of minimising impacts on fauna and fauna habitat as much as reasonable and practicable in particular the quenda which is likely to be occupying much of the denser wetland vegetation.

## 1. INTRODUCTION

This report details the results of a fauna assessment of various freehold allotments within and area of land referred to a West Piara Waters located in the City of Armadale (subject site). The subject site is situated about 20 kilometres south the Perth central business district in south west Western Australia and is centred at approximately 32.12921°S and 115.90505°E (Figure 1).

The subject site covers approximately 124 ha, most of which is cleared or parkland cleared though some areas of remnant native vegetation remain (Figure 2).

## 2. DEVELOPMENT PROPOSAL

It is understood that outline development plans are being prepared to support future development across the subject site. A range of investigations, including this fauna survey, have been undertaken in order to fully understand the suite of environmental values across the area. The findings of this fauna survey and other investigations will be used to inform and support the development, with the primary aim of minimising potential environmental impacts as much as reasonable and practicable.

It is also anticipated that the information presented will be used by regulatory authorities to assess the potential impact of the proposal on fauna and fauna habitats as part of finalising the outline development plan and for future subdivision development approval processes.

## 3. SCOPE OF WORKS

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

1. Level 1 fauna assessment (in accordance with EPA (2016) guidelines);
2. Targeted searches for black cockatoo habitat/site use (habitat trees, existing and potential nest hollows, foraging and roosting habitat);
3. Identification of any other potentially occurring significant fauna species and their habitat; and
4. Report summarising methods, results and discussion on likely constraints on development within the subject site.

Note: For the purposes of this proposal the term Black Cockatoo is in reference to Baudin's Black Cockatoo *Calyptorhynchus baudinii*, Carnaby's Black Cockatoo *Calyptorhynchus latirostris* and the Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*.

## **4. METHODS**

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

#### **4.1.1 Database Searches**

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

- DBCA's NatureMap Database Search (combined data from DBCA, ALA, WAM, BA and consultant's reports) (DBCA 2018b); and
- Protected Matters Search Tool (DotEE 2018).

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

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

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

Fauna surveys, assessments and reviews have been undertaken in nearby areas in the past, though not all are publicly available and could not be referenced. The most significant of those available have been used as the primary reference material for compiling a list of fauna species of conservation significance most likely to occur in the general area.

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

- ATA Environmental (2006). Vertebrate Fauna Assessment Brookdale Redevelopment Area. Unpublished report for the Armadale Redevelopment Authority.
- ENV Australia (2005). Southern River Precinct 3 - Environmental Review. Unpublished report for the City of Gosnells.
- ENV (2009). Jandakot Airport Fauna Survey. Unpublished report for Jandakot Airport Holdings Pty Ltd.
- Phoenix Environmental Sciences (2011). Vertebrate Fauna Survey for the Roe Highway Extension Project. Unpublished report for South Metro Connect.

- Turpin, J. and Bamford, M. (2009). Keane Road Strategic Link Armadale, Fauna Assessment. Unpublished report for EnviroWorks Consulting.

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

#### 4.1.3 Existing Publications

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

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

- Storr, G.M., Smith, L.A. and Johnstone R.E. (1990). Lizards of Western Australia III: Geckos and Pygopods. WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1999). Lizards of Western Australia I: Skinks. Revised Edition, WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (2002). Snakes of Western Australia. Revised Edition, WA Museum, Perth.
- Tyler M.J. & Doughty P. (2009). Field Guide to Frogs of Western Australia, Fourth Edition, WA Museum, Perth.
- Van Dyck, S., Gynther, I. & Baker, A. Eds (2013). Field Companion to The Mammals of Australia. Queensland Museum.
- Wilson, S. and Swan, G. (2013). A Complete Guide to Reptiles of Australia. Reed, New Holland, Sydney.
- Woinarski, J., Burbidge, A. & Harrison, P. (2014). The Action Plan for Australian Mammals 2012. CSIRO Publishing.

#### 4.1.4 Fauna of Conservation Significance

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

- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. Administered by the Australian Government DoEE;
- *Wildlife Conservation Act 1950 (WC Act)*. Administered by the Western Australian DBCA (Govt. of WA 2018);
- Red List produced by the SSC of the World Conservation Union (also known as the IUCN Red List - the acronym derived from its former name of the International Union for Conservation of Nature and Natural Resources). The Red List has no legislative power in Australia but is used as a framework for State and Commonwealth categories and criteria; and
- DBCA Priority Fauna list. A non-statutory list maintained by the DBCA for management purposes (DBCA 2018a).

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

- Japan Australia Migratory Bird Agreement 1981 (JAMBA);
- China Australia Migratory Bird Agreement 1998 (CAMBA);

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

(Note – Some species listed under JAMBA are also protected under Schedule 5 of the *WC Act*.)

Most but not all migratory bird species listed in the annexes to these bilateral agreements are protected in Australia as matters of national environmental significance (MNES) under the *EPBC Act*. Fauna listed as marine under the *EPBC Act* are not considered as a matter of national environmental significance.

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

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

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

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

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

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

#### **4.1.5 Invertebrate Fauna of Conservation Significance**

It can be difficult to identify significant invertebrate species (e.g. short range endemics (SREs) as there are uncertainties in determining the range-restrictions of many species due to lack of surveys, lack of taxonomic resolutions within target taxa and problems in identifying certain life stages. Where invertebrates are collected during surveys, a high

percentage are likely to be unknown, or for known species there can be limited knowledge or information on their distribution (Harvey 2002).

For this project, the assessment for conservation significant invertebrates has been limited to those listed by the DBCA and *EPBC Act* database searches (which rely on distribution records and known habitat preferences). No assessment of the potential for SREs to be present has been made.

#### 4.1.6 Likelihood of Occurrence – Fauna of Conservation Significance

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

- Would Not Occur: There is no suitable habitat for the species in the subject site and/or there is no documented record of the species in the general area since records have been kept and/or the species is generally accepted as being locally/regionally extinct (supported by a lack of recent records).
  - Locally Extinct: Populations no longer occur within a small part of the species natural range, in this case within 10 or 20 km of the subject site. Populations do however persist outside of this area.
  - Regionally Extinct: Populations no longer occur in a large part of the species natural range, in this case within the Perth section of the Swan Coastal Plain and nearby Darling Range. Populations do however persist outside of this area.
- Unlikely to Occur: The subject site is outside of the currently documented distribution for the species in question, or no suitable habitat (type, quality and extent) was identified as being present during the field assessment. Individuals of some species may occur occasionally as vagrants/transients especially if suitable habitat is located nearby but the subject site itself would not support individuals or a population the species.
- Possibly Occurs: The subject site is within the known distribution of the species in question and habitat of at least marginal quality was identified as being present during the field assessment, supported in some cases by recent records being documented in literature from within or near the subject site. In some cases, while a species may be classified as possibly being present at times, habitat may be marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.
- Known to Occur: The species in question was positively identified as being present (for sedentary species) or as using the subject site as habitat for some other purpose (for non-sedentary/mobile species) during the field survey. This information may have been obtained by direct observation of individuals or by way of secondary

evidence (e.g. foraging debris, tracks and scats). In some cases, while a species may be classified as known to occur, habitat may be marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.

#### **4.1.7 Taxonomy and Nomenclature**

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

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

### **4.2 SITE SURVEYS**

Daytime reconnaissance surveys of the subject site were carried out by Greg Harewood (Zoologist) on the 6 and 9 April 2018. It should be noted that access to some lots was restricted and therefore direct observations were limited in these areas.

#### **4.2.1 Fauna Habitat Assessment**

The vegetation communities identified during the botanical survey of the site carried out by Bennett Environmental Consulting (BEC 2011) have been used as the basis for a classification of areas into broad fauna habitat types. This information has been supplemented with observations made during the more recent fauna assessment.

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

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



## 4.2.2 Black Cockatoo Habitat Assessment

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

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

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

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

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

### 4.2.2.1 Black Cockatoo Breeding Habitat

The black cockatoo breeding habitat assessment involved the identification of all suitable breeding trees species within the subject site that had a DBH of equal to or over 50cm. The DBH of each tree was estimated using a pre-made 50 cm "caliper".

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

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

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

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

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

#### **4.2.2.2 Black Cockatoo Foraging Habitat**

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

#### **4.2.2.3 Black Cockatoo Roosting Habitat**

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

#### **4.2.3 Opportunistic Fauna Observations**

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

### **5. SURVEY CONSTRAINTS**

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

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

- seasonal inactivity during the field survey;
- species present within micro habitats not surveyed;
- cryptic species able to avoid detection; and
- transient wide-ranging species not present during the survey period.

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

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

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

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

As previously indicated access to some lots was restricted and therefore direct observations were limited in these areas.

## 6. RESULTS

### 6.1 POTENTIAL FAUNA INVENTORY – LITERATURE REVIEW

A list of vertebrate fauna species considered most likely to occur in the subject site has been compiled from information obtained during the literature review and is presented in Appendix B. This listing was refined after information gathered during the site reconnaissance survey was assessed. The results of some previous fauna surveys carried out in the general area are summarised in this listing as are the DBCA NatureMap database search results (with species considered unlikely to occur being omitted). The raw database search results from NatureMap (DBCA 2018b) and the Protected Matters Search Tool (DotEE 2018) are contained within Appendix C.

The list of potential fauna takes into consideration that firstly, the species in question is not known to be locally extinct and secondly, that suitable habitat for each species, as identified during the habitat assessment, is present within the subject site, though compiling an accurate list has limitations (see Section 5 above) and therefore as discussed, the listing is very likely to be an overestimation of the fauna species actually present onsite at any one time.

With respect to native vertebrate fauna, nine mammal (including eight bat species), 118 bird, 20 reptile and nine frog species have previously been recorded in the wider area, some of which have the potential to occur in or utilise sections of the subject site at times. Thirteen species of introduced animals could also frequent the area.

Of the 156 native vertebrate animals that are listed as potentially occurring, four are considered to be endangered/vulnerable or in need of special protection under State and/or Federal law. In addition, one DBCA priority species is also listed as potentially occurring. These particular species are discussed in further detail in the following sections of the report.

### 6.2 SITE SURVEYS

#### 6.2.1 Fauna Habitat Assessment

The subject site is situated centrally located within a part of the Swan Coastal Plain in an area that has largely been historically cleared of vegetation, primarily for livestock grazing and subsequently residential developments.

Remnant native vegetation within the subject site (28% of the total area) is now mainly represented by wetland vegetation dominated by paperbark and/or flooded gum low forests or woodland over native understorey, herblands, sedgelands, introduced weeds or grasslands (~21.3% of the total area). A small number of manmade dams and drains, some with a coverage of *Typha orientalis* are also present.



Remnant upland vegetation is present as small groves of woodland/forest comprised of tree species in various densities and combinations including banksia, sheoak, coastal blackbutt and jarrah over native understorey, introduced weeds and/or grasslands (~6.7% of the subject site)





The balance of the subject site (~72.00% of the total area) is either totally cleared or parkland cleared with scattered trees, mostly planted non-endemic eucalyptus species, with a small number of endemics, some of which have also been planted (e.g. tuarts).





The subject site shows some subtle topographic highs (low dunes) but has no significant topographical features and is characterised by being almost flat with elevations ranging from about 27m AHD in the lowest area to about 35 m AHD on dune crests. Soils within the subject site are mainly represented by grey Bassendean Sands with peaty/loamy sand in wetland areas.

Descriptions and examples images of the main fauna habitats/dominant vegetation present within the subject site are provided in Table 1. The location and extent of the identified habitat elements is shown in Figure 3 (based on BEC 2011).

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

Fauna Habitat Description	Example Image
<b>Wetland Habitats (26.3 ha – 21.3%)</b>	
<p>Low Forest of Flooded Gum over Open Herbs and Open Tall Sedges on black sandy loam.</p> <p>Total Area = ~1.7 ha (~1.4%)</p>	
<p>Dense Low Forest/Low Woodland of Paperbark (occasional Flooded Gum in some areas) over Scrub/Dense Thicket of <i>Kunzea</i> over Herbs/Dense Sedges/Tall Grass on damp grey to black sand/loamy sand.</p> <p>Total Area = ~7.9 ha (~6.4%)</p>	

Fauna Habitat Description	Example Image
<p>Open Low Woodland of Paperbark in paddock area over Dense Tall Grass over Herbs on grey sand.</p> <p>Total Area = ~12.4ha (~10.1%)</p>	
<p>Dense Thicket of <i>Kunzea glabrescens</i> over Dwarf Scrub and Tall Sedges on grey sand.</p> <p>Total Area = ~1.1 ha (~0.9%)</p>	
<p>Heath of <i>Melaleuca viminea</i> and <i>Melaleuca incana</i> over Open Herbs and Tall Sedges on damp grey sand.</p> <p>Total Area = ~0.9 ha (~0.7%)</p>	
<p>Dense Herbs over Open Tall Sedges on damp sandy loam.</p> <p>Total Area = ~1.1 ha (~0.9%)</p>	

Fauna Habitat Description	Example Image
<p>Open Low Grass over Open Herbs and Very Open Sedges on damp grey sand.</p> <p>Total Area = ~1.2 ha (~1.0%)</p>	
<p>Dams (some with coverage of <i>Typha</i>)</p> <p>Total Area = ~0.8 ha (~0.6%)</p>	
<p><b>Upland Habitats (8.2 ha – 6.7%)</b></p>	
<p>Low Woodland/Open Low Woodland of <i>Banksia</i>, Sheoak, <i>Nuytsia floribunda</i> and Coastal Blackbutt or Jarrah over Dwarf Scrub, Heath, Grass and/or Herbs on grey sand.</p> <p>Total Area = ~8.2 ha (~6.7%)</p>	
<p><b>Non-native/hardstand (88.9ha – 72.0%)</b></p>	
<p>Heavily disturbed areas comprising open paddocks covered in grassland/weeds with scattered planted vegetation, houses, sheds or areas of hardstand or bare ground.</p> <p>Total Area = ~88.9 ha (~72.0%)</p>	

Overall fauna habitat values at the subject site have been severely compromised by the removal of most of the original native vegetation and the degradation of remnant patches. Most areas lack any natural attributes and are now only utilised by generally common and widespread fauna species with non-specific requirements which allow them to persist in disturbed/highly disturbed habitats. As a consequence, the fauna diversity of the subject site is well below levels present prior to historical disturbances having occurred.

Despite the lack of biodiversity the site still retains some value for a small number of species of conservation significance, in particular black cockatoos (foraging and roosting opportunities) and the quenda though the groves of remnant vegetation present are limited in extent, fragmented, generally in a degraded condition and subject to ongoing decline.

## 6.2.2 Black Cockatoo Habitat Assessment

### 6.2.2.1 Black Cockatoo Habitat Tree Assessment

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

- Flooded Gum – *Eucalyptus rudis*;
- Jarrah – *Eucalyptus marginata*;
- Coastal Blackbutt - *Eucalyptus todtiana*;
- Tuart – *Eucalyptus gomphocephala* (planted specimens only);
- Dead unidentifiable species;
- Unknown non-endemic eucalyptus (planted).

A summary of the potential black cockatoo breeding trees (using DotEE criteria i.e. any suitable tree species with a DBH  $\geq$  50cm (Commonwealth of Australia 2012)) observed within the subject site is provided in Table 2 below and their location shown in Figure 4.

**Table 2: Summary of potential cockatoo breeding habitat trees (DBH  $\geq$ 50cm)**

Total Number of Habitat Trees	Number of Trees with <u>No Hollows</u> Observed	Number of Trees with Hollows Considered <u>Unsuitable</u> for Nesting Black Cockatoos	Number of Trees with Hollows Considered <u>Possibly Suitable</u> for Nesting Black Cockatoos	Tree Species					
				Flooded Gum	Jarrah	Tuart (planted)	Blackbutt Planted	Non-Endemic Euc (Planted)	Dead - Unknown
181	181	0	0	6	4	3	2	164	2



The assessment identified a total of 181 trees with a DBH of  $\geq 50$ cms within the subject site. The majority of these trees (164, 90.6%) are planted non-endemic eucalypts. It is not known if these tree species have the propensity to develop hollows for black cockatoos.

No trees were identified as potentially containing hollows of any size. Additional details on each habitat tree observed can be found in Appendix D.

There appears to be a paucity of black cockatoo breeding data for the general area. This could simply be a consequence of a lack of survey work or a lack of publicly available data.

The most likely species to breed in the vicinity is the forest red-tailed black cockatoo and it is known to breed in some nearby suburbs (e.g. Gosnells - Tony Kirkby pers. comm.). Carnaby's black cockatoo also commonly occurs in the local area but as a regular (non-breeding) seasonal migrant. Baudin's black cockatoo has a strong preference for the Darling Range and Darling Scarp but has been known to move out on to the eastern edge of the Swan Coastal Plain. Of the three species, this is the least likely to occur and the least likely to breed within the local area.

Based on available vegetation mapping it is estimated that there is approximately 11,500 ha of native vegetation within 12 km the subject site (~22% of total area) some of which is likely to contain potential breeding habitat. Bush forever sites make up about 75% of this area of remnant vegetation.

### 6.2.2.2 Black Cockatoo Foraging Habitat Assessment

Following is a list of the main flora species recorded within the subject site during the flora (BEC 2011) and fauna assessment that are known to be used as a food source by one or more species of black cockatoo:

- Jarrah – *Eucalyptus marginata* - Seeds;
- Coastal Blackbutt - *Eucalyptus todtiana* – Seeds;
- Tuart – *Eucalyptus gomphocephala* - Flowers, seeds, nectar;
- Flooded Gum – *Eucalyptus rudis*- Flowers, nectar;
- *Banksia* species – *B. attenuata*, *B. ilicifolia*, *B. menziesii* - Flowers, seeds;
- Sheoak – *Allocasuarina fraseriana* - Seeds;
- Balga – *Xanthorrhoea preissii* - Flowers, seeds;
- Orange Wattle - *Acacia saligna* – Bark, grubs;
- Grey Stinkwood - *Jacksonia furcellata* – Seeds;
- Peppermint Tree - *Agonis flexuosa* – Bark, grubs;

- Corkscrew Grass or Storksbill (exotic) - *Erodium botrys* – Seeds;
- Wild Radish (exotic) - *Raphanus raphanistrum* – Seeds.

It should be noted that some of the above-mentioned species (e.g. flooded gum, tuart, peppermint, balga bush) are only foraged upon to a small degree compared to more favoured plant species (e.g. *banksia*). The overall abundance of some species is also relatively low (e.g. the number of jarrah and sheoak trees present is small). These plant species therefore do not contribute significantly to the total foraging resource present which is mainly represented by areas mapped as containing banksia. Marri (*Corymbia calophylla*), a plant species favoured by all three species of black cockatoos is absent from the subject site.

Foraging debris (all in the form of chewed blackbutt and sheoak fruits) left by black cockatoos was observed at a small number of locations within the subject site during the survey period. This foraging activity was attributed to the forest red-tailed black cockatoo but some (chewed blackbutt fruits) may have been caused by Carnaby's as they also utilise this resource.

Based on available vegetation mapping it is estimated that there is approximately 11,500 ha of native vegetation within 12 km the subject site (~22% of total area) much of which is likely to represent foraging habitat of some type. Bush forever sites make up about 75% of this area of remnant vegetation.

It is difficult to calculate the actual extent of quality natural foraging habitat within the subject site given it is largely comprised of patchy, fragmented vegetation of variable quality, but it is unlikely to total more than about 8.2 ha (i.e. areas mapped as containing *banksia* – see Figure 3). This area represents less than 0.07% of the remnant native vegetation within 12 km of the subject site.

### 6.2.2.3 Black Cockatoo Roosting Habitat Assessment

No black cockatoo roosting activity within the subject site was noted during the survey period. A review of the 2017 Great Cocky Count database shows no documented roost sites within the subject site, the closest being about 500m north. This site was in use by six forest red-tailed black cockatoos during the 2017 count and 45 white tailed black cockatoos (most probably Carnaby's) during the 2015 Great Cocky Count. Another 22 documented sites (but not necessarily in current use) occur within 6 km of the subject site.

### 6.2.3 Opportunistic Fauna Observations

Opportunistic fauna observations are listed in Appendix B. A total of 29 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the subject site during the survey period. Five introduced species (horse, red fox, rabbit, laughing turtle dove, rainbow lorikeet) were also recorded.

Most of the fauna species recorded were common, widespread bird species.

Only one fauna species of conservation significance was recorded during the survey period (the forest red-tailed black cockatoo – foraging evidence).

### 6.3 FAUNA INVENTORY – SUMMARY

#### 6.3.1 Vertebrate Fauna

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

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

Group	Total number of Potential species	Potential number of Specially Protected species	Potential number of Migratory species	Potential number of Priority species	Number of species Observed: Field Survey 2018
Amphibians	9	0	0	0	0
Reptiles	20	0	0	1	1
Birds	124 <sup>6</sup>	4	0	0	29 <sup>2</sup>
Non-Volant Mammals	8 <sup>7</sup>	0	0	1	4 <sup>3</sup>
Volant Mammals (Bats)	8	0	0	0	0
<b>Total</b>	<b>169<sup>13</sup></b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>34<sup>5</sup></b>

Superscript = number of introduced species included in total.

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

Despite the omission of some species it should be noted that the list provided is still very likely an over estimation of the fauna species utilising the subject site (either on a regular or infrequent basis) as a result of the precautionary approach adopted for the assessment. At

any one time only a subset of the listed potential species are likely to be present within the bounds of the subject site.

As most of the subject site is cleared the majority represents unsuitable habitat for many of the potential species listed. Most, if present, would be confined to the small areas of remnant native bushland and even in these areas only a subset of the species listed are likely to be present at any one time.

### 6.3.2 Vertebrate Fauna of Conservation Significance

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

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

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

Some foraging evidence attributed to this species was found during field survey (chewed sheoak fruits and possibly chewed coastal blackbutt fruits). The small areas of remnant native vegetation containing jarrah, coastal blackbutt and sheoak within the subject site represents foraging habitat for this species. No actual nest sites were found however larger trees ( $\geq 50\text{cm}$  DBH) can be considered potential breeding habitat. No evidence of roosting observed.

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

- *Lerista lineata* Perth Lined Lerista – P3 (DBCA Priority Species)  
Habitat appears to be suitable for this species to persist and it has been recorded nearby (ENV 2009, Phoenix 2010). Known to inhabit gardens (Nevill 2005, Bush *et al.* 2010) so may persist in degraded areas and landscaped gardens subsequent to development.
- *Calyptorhynchus latirostris* Carnaby's Black Cockatoo – S2 (*WC Act*), Endangered (*EPBC Act*)  
Some foraging evidence which could possibly be attributed to this species was found during field survey (chewed blackbutt fruits) but this could not be distinguished from the forest red-tailed black cockatoo which also feeds on the same fruits and leaves similar traces. The small areas of remnant native vegetation containing jarrah,

coastal blackbutt and banksia within the subject site represents foraging habitat for this species. No actual nest sites were found however larger native endemic trees ( $\geq 50$ cm DBH) can be considered potential breeding habitat. No evidence of roosting observed.

- *Calyptorhynchus baudinii* Baudin's Black Cockatoo – S2 (WC Act), Endangered (EPBC Act)  
This species is only infrequently recorded on this section of the coastal plain. No evidence of this species utilising the subject site was observed. The small areas of remnant native vegetation containing *banksia* within the subject site represents foraging habitat for this species. No actual nest sites were found however larger native endemic trees ( $\geq 50$ cm DBH) can be considered potential breeding habitat. No evidence of roosting observed.
- *Isoodon fusciventer* Quenda – P4 (DBCA Priority Species)  
No evidence of this species being present was observed however the areas of paperbark containing dense undergrowth represent suitable habitat for this species and therefore it must be considered a potential species. Most of the subject site is however unsuitable for this species to use as habitat given it is almost totally cleared.
- *Falco peregrinus* Peregrine Falcon – S7 (WC Act)  
This species potentially utilises some sections of the subject site as part of a much larger home range. Uncommon across all of its range but may occur at least occasionally. The subject site appears not to contain any suitable nest sites for this species.

As previously indicated a number of other species of conservation significance, while possibly present in the wider area (e.g. larger bush remnants, forested areas of the nearby Darling Range), are not listed as potential species due to known localised extinction (and no subsequent recruitment from adjoining areas), lack of suitable habitat and/or the presence of feral predators. Details on conservation significant species and reasons for the omission of some from the potential listing are provided in Table 4.

Thirty five bird species that potentially frequent or occur in the subject site are noted as Bush Forever Decreaser Species in the Perth Metropolitan Region (six were sighted/identified as having used the within the subject site during the survey). Decreaser species are a significant issue in biodiversity conservation in the Perth section of the Swan Coastal Plain as there have been marked reductions in range and population levels of many sedentary bird species as a consequence of disturbance and land clearing (Dell & Hyder-Griffiths 2002).

### 6.3.3 Invertebrate Fauna of Conservation Significance

Six invertebrate species of conservation significance appeared in the DBCA or EPBC Act database searches (DBCA 2018b, DotEE 2018), these being an unnamed cricket (*Throscodectes xiphos*), the graceful sunmoth (*Synemon gratiosa*), three short tongued

native bees (*Leioproctus contrarius*, *Leioproctus douglasiellus* and *Neopasiphae simplicior*) and Carter’s freshwater mussel (*Westralunio carteri*).

None of these species are considered likely to persist within the subject site either due to a total absence of suitable habitat or the presence of only small areas of generally degraded habitat (poor quality, limited extent and highly fragmented) considered unsuitable to support or maintain population/s of the species in question.

## 7. FAUNA VALUES

### 7.1 CONSERVATION SIGNIFICANCE OF THE SUBJECT SITE

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

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

The majority of the subject site is cleared (~72%) and as a consequence the diversity of fauna species has been significantly reduced from its original natural levels. Habitat degradation as a result of partial clearing, altered fire regimes and the presence of introduced predators is also likely to have had a significant effect on species diversity in the remnants that remain. Because of these factors most of the site has very little conservation significance to fauna in general. This is to a certain extent supported by the fact that none of the vegetation remaining on site was selected for inclusion in bush forever while some nearby remnants were (Government of Western Australia 2000a).

The site does have some value principally as foraging habitat for black cockatoos but the extent of this vegetation, relative to that present in nearby reserved/national park areas, is relatively small. Some of the larger remnants are also likely to provide habitat for of native fauna species of conservation significance (e.g. quenda) in a largely cleared landscape and the retention and ongoing management of these areas should be considered during development planning, though most are of a very small size and the high degree of fragmentation limits their long-term viability.

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

Wildlife or ecological corridors are considered to provide avenues for the movement of individuals and populations of both flora and fauna. An ecological corridor is defined as ‘habitat that permits the movement of organisms between ecological isolates’ and linkage with adjacent bushland areas is therefore a natural attribute of high priority in the assessment of any sites significance. These corridors can be important for the survival of species as they provide access to feeding and breeding locations as well as access to other populations and therefore to a wider gene pool (Newmark 1993).

Within Bush Forever Volume 1 (Figure 6 - Government of Western Australia 2000a) conceptual “greenway” corridors are shown. The subject site is not shown as forming part of any recognised greenway corridor though several are shown nearby running along road reserves or through bush forever sites which lie to the west and south.

More recent mapping (PBP 2007) also shows several regional ecological linkages (e.g. Link 47) passing near the subject site but not supporting it to any significant degree.

## **8. POTENTIAL IMPACTS AND DEVELOPMENT CONSIDERATIONS**

### **8.1 POTENTIAL IMPACTS OF DEVELOPMENT**

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

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

- An increase in fauna road kills subsequent to development.

The exact extent of development within the subject site is not known at this stage. However, assuming that the area is developed for residential purposes in a similar fashion to nearby developments (e.g Piara Waters) it is expected that the majority of the remnant vegetation would be removed. Based on this assumption, possible impacts on specific species of conservation significance previously recorded in the general area is provided in the table below.

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

Common Name	Genus & Species	Conservation Status (See Appendix A for codes)	Habitat Present	Likelihood of Occurrence	Maximum Possible Impacts
Graceful Sun Moth	<i>Synemon gratiosa</i>	P4	No/Marginal	Unlikely to Occur.	No impact anticipated.
Unnamed Cricket	<i>Throscodectes xiphos</i>	P1	No/Marginal	Unlikely to Occur.	No impact anticipated.
Unnamed Bee	<i>Leioproctus contrarius</i>	P3	No/Marginal	Unlikely to Occur.	No impact anticipated.
Short-tongued Bee	<i>Neopasiphae simplicior</i>	S2, CR	No/Marginal	Unlikely to Occur.	No impact anticipated.
Unnamed Bee	<i>Leioproctus douglasiellus</i>	S2, CR	No/Marginal	Unlikely to Occur.	No impact anticipated.
Carter's Freshwater Mussel	<i>Westralunio carteri</i>	S3, VU	No	Would Not Occur.	No impact.
Perth Lined Lerista	<i>Lerista lineata</i>	P3	Yes/Marginal	Possibly Occurs.	Loss/modification of very small areas of degraded habitat. Significant impact not likely.
Darling Range Heath Ctenotus	<i>Ctenotus delli</i>	P4	No	Would Not Occur.	No impact.
Coastal Plains Skink	<i>Ctenotus ora</i>	P3	No/Marginal	Unlikely to Occur.	No impact anticipated.
Black-striped Snake	<i>Neelaps calonotos</i>	P3	No/Marginal	Unlikely to Occur.	No impact anticipated.
Southern Death Adder	<i>Acanthophis antarcticus</i>	P3	No	Would Not Occur.	No impact.
Malleefowl	<i>Leipoa ocellata</i>	S3, VU	No	Would Not Occur. - species locally extinct.	No Impact.
Australasian Bittern	<i>Botaurus poiciloptilus</i>	S2, EN	No/Marginal	Unlikely to Occur.	No impact anticipated.
Little Bittern	<i>Ixobrychus minutus</i>	P4	No/Marginal	Unlikely to Occur.	No impact anticipated.
Hooded Plover	<i>Charadrius rubricollis</i>	P4	No	Would Not Occur.	No impact.
Glossy Ibis	<i>Plegadis falcinellus</i>	S5, Mig	No/Marginal	Unlikely to Occur.	No impact anticipated.
Painted Snipe	<i>Rostratula benghalensis</i>	S2, Mig, EN	No	Would Not Occur.	No impact.



Common Name	Genus & Species	Conservation Status (See Appendix A for codes)	Habitat Present	Likelihood of Occurrence	Maximum Possible Impacts
Migratory Shorebirds/Wetland/Seabird Species	Various	S5, Mig, Various	No	Would Not Occur.	No impact.
Blue-billed Duck	<i>Oxyura australis</i>	P4	No/Marginal	Unlikely to Occur.	No impact anticipated.
Osprey	<i>Pandion haliaetus</i>	S5, Mig	No	Would Not Occur.	No impact.
Peregrine Falcon	<i>Falco peregrinus</i>	S7	Yes	Possible but only rarely.	Loss/modification of very small areas of degraded habitat. Significant impact not likely.
Masked Owl (SW population)	<i>Tyto n. novaehollandiae</i>	P3	No	Would Not Occur.	No impact.
Fork-tailed Swift	<i>Apus pacificus</i>	S5, Mig	Yes	Unlikely to Occur, Flyover only on very rare occasions.	No impact.
Grey Wagtail	<i>Motacilla cinerea</i>	S5, Mig	No	Would Not Occur.	No impact.
Carnaby's Black Cockatoo	<i>Calyptorhynchus latirostris</i>	S2, EN	Yes	Possibly Occurs.	Loss/modification of small areas of habitat. Significant impact not likely.
Baudin's Black Cockatoo	<i>Calyptorhynchus baudinii</i>	S2, EN	Yes/Marginal	Possibly occurs but only rarely.	Loss/modification of small areas of habitat. Significant impact not likely.
Forest Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii naso</i>	S3, VU	Yes	Known to Occur.	Loss/modification of small areas of habitat. Significant impact not likely.
Chuditch	<i>Dasyurus geoffroii</i>	S3, VU	No	Would Not Occur. Locally extinct	No impact.
Quenda	<i>Isodon fusciventer</i>	P4	Yes	Possibly Occurs.	Loss/modification of small areas of habitat. Potential for individuals to be killed or injured during clearing.
Numbat	<i>Myrmecobius fasciatus</i>	S3, VU	No	Would Not Occur - species locally extinct.	No Impact.
Western Ringtail Possum	<i>Pseudocheirus occidentalis</i>	S1, CR	No	Would Not Occur - species locally extinct.	No Impact.
Quokka	<i>Setonix brachyurus</i>	S3, VU	No	Would Not Occur - species locally extinct.	No Impact.
Tammar	<i>Macropus eugenii derbianus</i>	P4	No	Would Not Occur - species locally extinct.	No Impact.
Western Brush Wallaby	<i>Macropus irma</i>	P4	No	Would Not Occur.	No impact.
Western False Pipistrelle	<i>Falsistrellus mackenziei</i>	P4	No	Unlikely to Occur.	No impact anticipated.
Water Rat	<i>Hydromys chrysogaster</i>	P4	No	Unlikely to Occur.	No impact anticipated.

## 8.2 CONSIDERATIONS FOR PLANNING AND DEVELOPMENT

With respect to vertebrate fauna in general, no significant impacts are anticipated as a consequence of development at the site. In cases where some impact is anticipated, the degree of the impact is only expected to be low and relates to the loss of small areas of habitat. As most species are common and widespread no overall change in their conservation status is anticipated, despite a possible localised reduction in habitat extent. There are substantial areas of similar habitat in nearby areas including some nature reserves/regional parks and most if, not all species likely to utilise the subject site will persist in these locations despite any future development.

The assessment does indicate that any considerations required during ongoing development planning would be limited to the presence of habitat used or potentially used by some threatened fauna species in particular those listed under the *EPBC Act*, namely the three species of black cockatoo.

The total number of “habitat” trees (181), most of which are planted non-endemic species and the quality and extent of what could be regarded as foraging habitat (~8.2 ha) is also relatively low compared to the likely quality and extent of remnant native vegetation within 12 km of the subject site (~11,500 ha).

With this in mind it is considered highly unlikely that impacts on black cockatoos that may occur as a result of development at any scale would be considered a “significant impact” as defined by the Commonwealth DotEE (DotE 2013).

While the retention of areas of vegetation potentially utilised by black cockatoos should be considered during the planning process, based on the assessment above it is not likely to represent a constraint to development.

This conclusion is primarily based on the fact that most of the subject site is totally cleared or almost totally cleared of natural vegetation and therefore don't contain significant areas of potential cockatoo habitat. Where some habitat is present it is limited in extent and patchy in distribution. Also, as previously indicated there are significant areas (~11,500 ha) of potential black cockatoo habitat with 12km of the subject site.

While some trees present within the subject site qualify as “potential breeding habitat” using DotEE criteria (Commonwealth of Australia 2012) the probability of any one tree actually developing hollows that would then be used by black cockatoos for breeding can be considered to be extremely low. The area is also unlikely to be considered of specific importance for the recovery of black cockatoos in the long term. For example the population growth of the Carnaby's black-cockatoo is primarily limited by factors associated with breeding, and consequently priority areas for the recovery of the species are currently focused on known breeding sites (Cale 2003).

## 9. CONCLUSION

The fauna assessment within the subject site was undertaken for the purposes of categorising the fauna assemblages and identifying fauna habitats present. A targeted assessment of black cockatoo habitat within the area was also carried out.

With respect to native vertebrate fauna, 9 mammals (includes eight bat species), 118 bird, 20 reptile, and nine frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the subject site at times, a conclusion largely based on the presence of apparently suitable habitat.

Of the 156 native animals that are listed as potentially occurring in the area, four are considered to be endangered/vulnerable or in need of special protection under State and/or Commonwealth legislation, these being the three species of black cockatoo and the peregrine falcon. In addition, the Priority 4 quenda and Perth lined lerista may also occur, given the presence of some suitable habitat for both species.

With respect to vertebrate fauna in general, no significant impacts are anticipated as a consequence of development at the site taking place. In cases where some impact is anticipated, the degree of the impact is only expected to be low and relates to the loss of small areas of fragmented and largely degraded habitat. As most species are common and widespread no overall change in their conservation status is anticipated, despite a possible localised reduction in habitat extent.

Based on available information it is considered, at this stage, unlikely that impacts on black cockatoos (or any other *EPBC Act* listed threatened or migratory species) which may occur as a result of development within the subject site will be considered “significant impact” as defined by the Commonwealth DotEE (DotE 2013). The conclusions drawn with respect to this matter should be reviewed once development plans are finalised.

Subject to the proposal going forward it is recommended that a fauna management plan be prepared for implementation during initial site works with the aim of minimising impacts on fauna and fauna habitat as much as reasonable and practicable in particular the quenda which is likely to be occupying much of the denser wetland vegetation.

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# FIGURES



**Legend**

 Subject Site Boundary

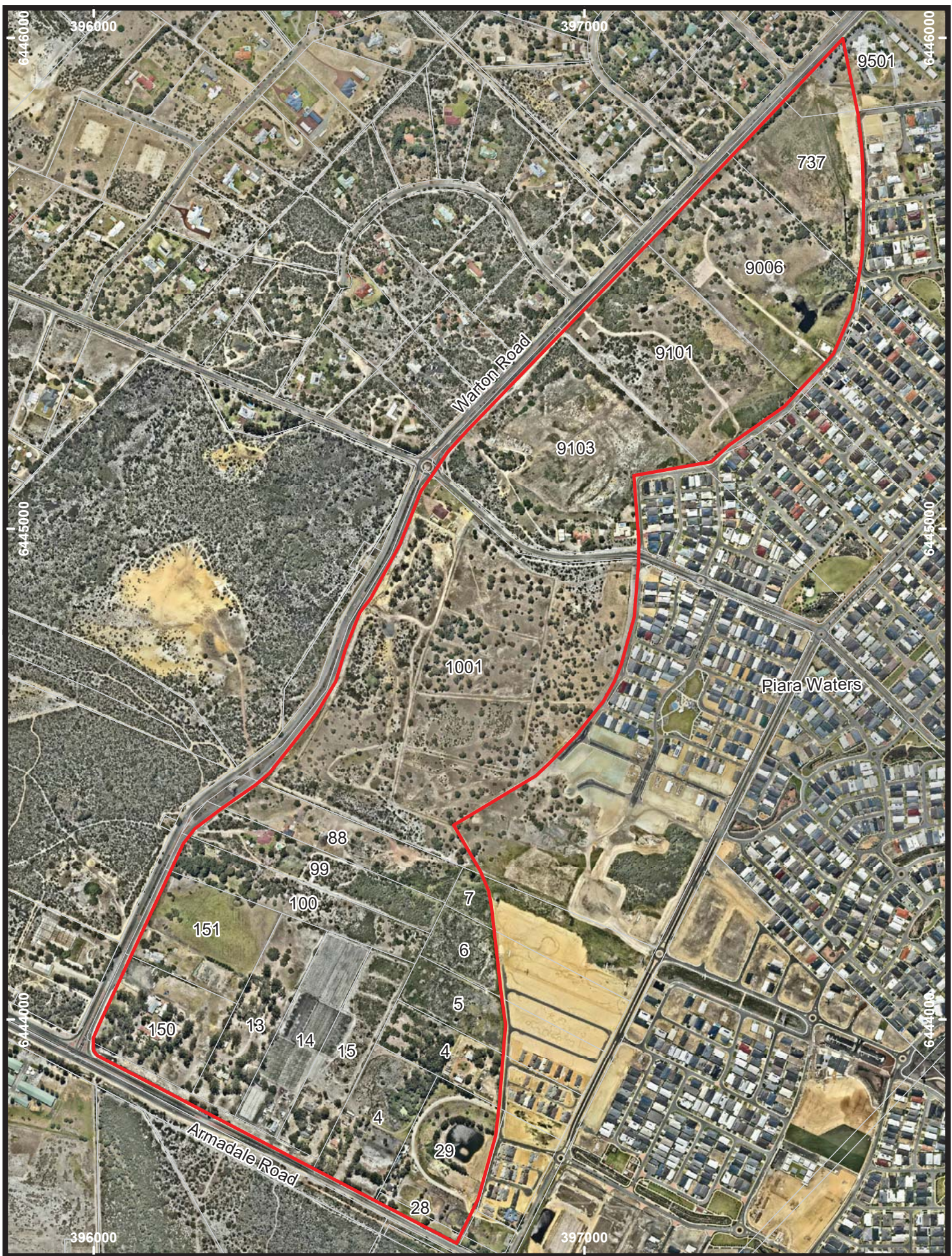


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Kilometres



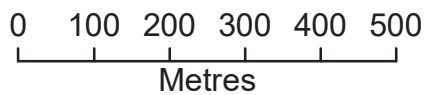
Drawn: G Harewood  
Date: May 2018  
Scale: 1:50,000

West Piara Waters  
Piara Waters  
**Subject Site  
and  
Surrounds**



**Legend**

 Subject Site Boundary



Drawn: G Harewood  
Date: May 2018  
Scale: 1:10,000

West Piara Waters  
Piara Waters

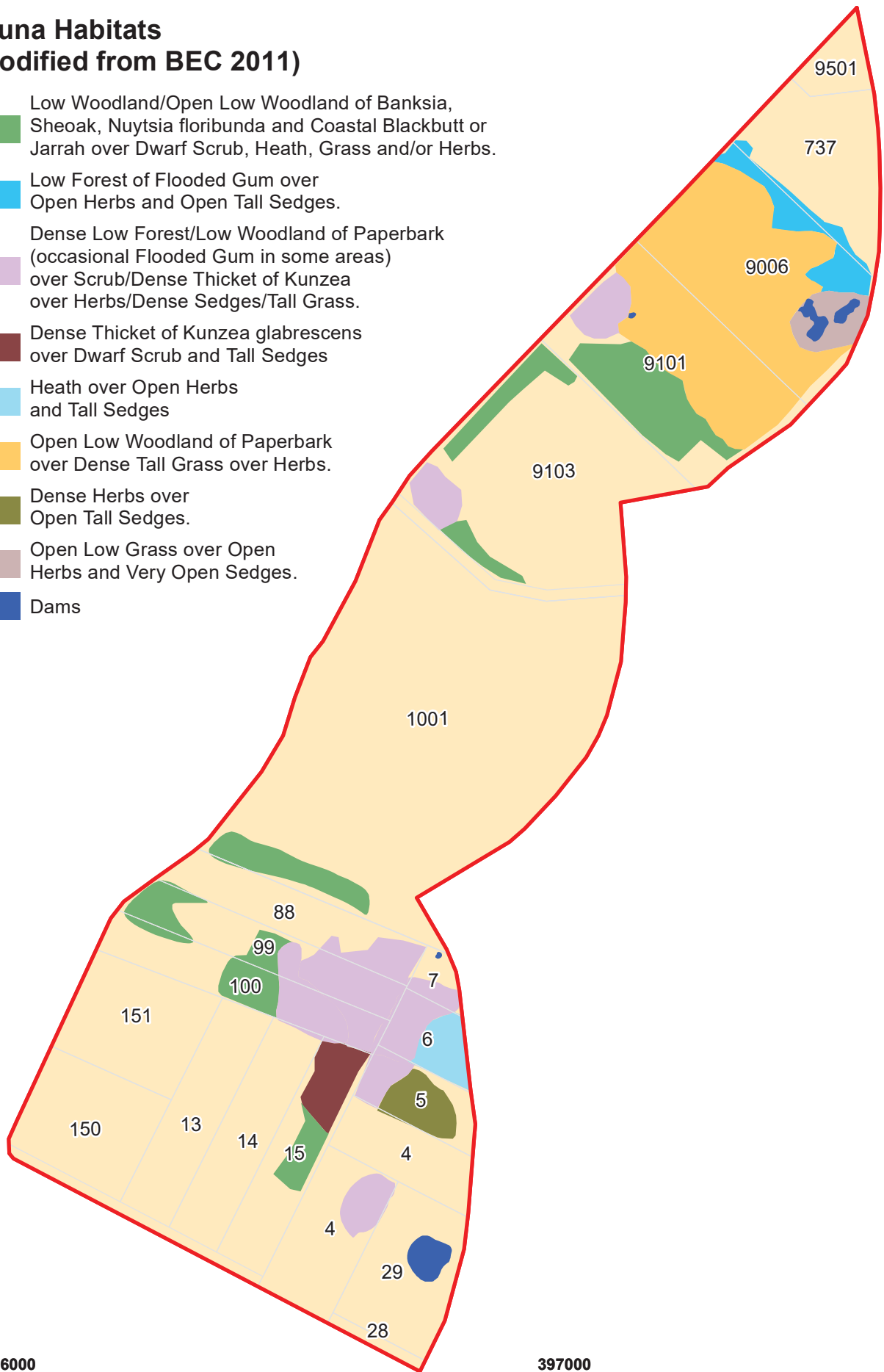
**Subject Site  
Air Photo**

Projection/Coordinate System: UTM/MGA Zone 50

Figure: 2

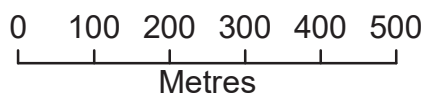
# Fauna Habitats (modified from BEC 2011)

- Low Woodland/Open Low Woodland of Banksia, Sheoak, Nuytsia floribunda and Coastal Blackbutt or Jarrah over Dwarf Scrub, Heath, Grass and/or Herbs.
- Low Forest of Flooded Gum over Open Herbs and Open Tall Sedges.
- Dense Low Forest/Low Woodland of Paperbark (occasional Flooded Gum in some areas) over Scrub/Dense Thicket of Kunzea over Herbs/Dense Sedges/Tall Grass.
- Dense Thicket of Kunzea glabrescens over Dwarf Scrub and Tall Sedges
- Heath over Open Herbs and Tall Sedges
- Open Low Woodland of Paperbark over Dense Tall Grass over Herbs.
- Dense Herbs over Open Tall Sedges.
- Open Low Grass over Open Herbs and Very Open Sedges.
- Dams



## Legend

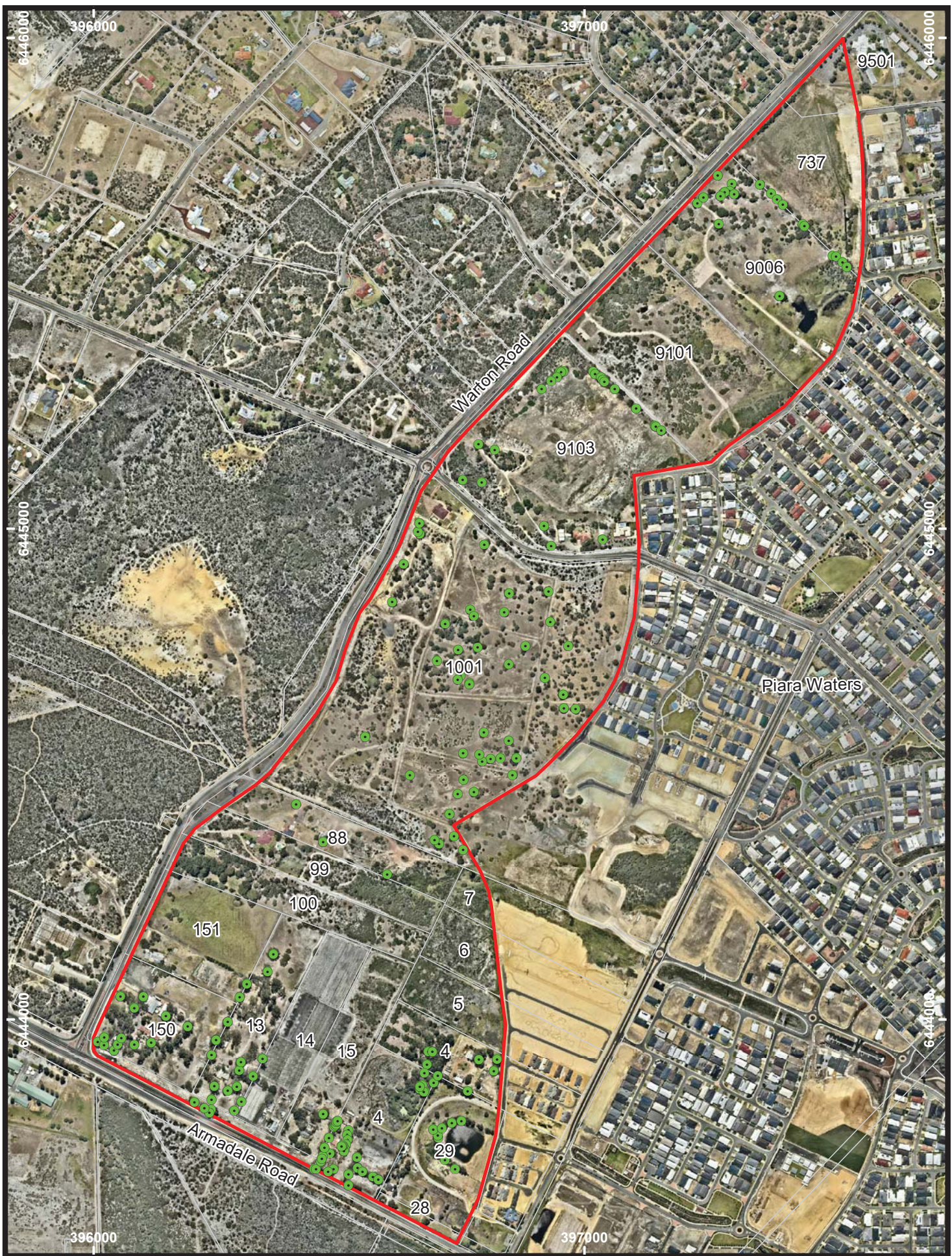
Subject Site Boundary



Drawn: G Harewood  
Date: May 2018  
Scale: 1:10,000

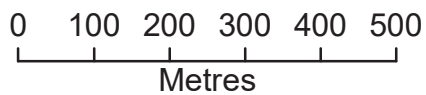
West Piar Waters  
Piar Waters

## Fauna Habitats



**Legend**

- Subject Site Boundary
- Habitat Tree
- No hollows observed



Drawn: G Harewood  
Date: May 2018  
Scale: 1:10,000

West Piara Waters  
Piara Waters

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

# **APPENDIX A**

## **CONSERVATION CATEGORIES**

## EPBC Act (1999) Threatened Fauna Categories

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

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

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

## Wildlife Conservation (Specially Protected Fauna) Notice 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  Critically Endangered species	CR	Threatened species considered to be facing an extremely high risk of extinction in the wild.
Schedule 2  Endangered species	EN	Threatened species considered to be facing a very high risk of extinction in the wild.
Schedule 3  Vulnerable species	VU	Threatened species considered to be facing a high risk of extinction in the wild.
Schedule 4  Presumed extinct species	EX	Species which have been adequately searched for and there is no reasonable doubt that the last individual has died.
Schedule 5  Migratory birds protected under an international agreement	IA	Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds.
Schedule 6  Fauna that is of special conservation need as conservation dependent fauna	CD	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
Schedule 7  Other specially protected fauna.	OS	Fauna otherwise in need of special protection to ensure their conservation.



## Western Australian 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 Poorly Known Species.	P1	Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Priority 2 Poorly Known Species.	P2	Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
Priority 3 Poorly Known Species.	P3	Species that are known from several locations and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
Priority 4 Rare, Near Threatened and other species in need of monitoring.	P4	(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.  (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.  (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

\*Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

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

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

Categories are summarized below.

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

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

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

# **APPENDIX B**

## **OBSERVED AND POTENTIAL VERTEBRATE FAUNA LISTING**

# Fauna Observed or Potentially in Subject Site

## West Piara Waters - Forrestdale

Approximate centroid = 32.12921°S 115.90505°E

Compiled by Greg Harewood - May 2018

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

A = Harewood, G. (2018). Fauna Assessment - West Piara Waters - Forrestdale. Unpublished report for Coterra Environment.

B = Phoenix Environmental Sciences (2011). Vertebrate Fauna Survey for the Roe Highway Extension Project. Unpublished report for South Metro Connect.

C = ENV (2009). Jandakot Airport Fauna Survey. Unpublished report for Jandakot Airport Holdings Pty Ltd.

D = Turpin, J. and Bamford, M. (2009). Keane Road Strategic Link Armadale, Fauna Assessment. Unpublished report for the EnviroWorks Consulting.

E = ATA Environmental (2006). Vertebrate Fauna Assessment Brookdale Redevelopment Area. Unpublished report for the Armadale Redevelopment Authority.

F = ENV Australia (2005). Southern River Precinct 3 - Environmental Review. Unpublished report for the City of Gosnells.

G = DBCA (2018). NatureMap Database search. "By Circle" 115° 54' 19" E, 32° 07' 44" S – Subject Site (plus 10 km buffer). 18 April 2018.

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

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G
<b>Hylidae</b>									
Tree or Water-Holding Frogs									
<i>Litoria adelaidensis</i>	Slender Tree Frog	LC		X	X	X	X	X	X
<i>Litoria moorei</i>	Motorbike Frog	LC		X			X	X	X
<b>Reptilia</b>									
<b>Gekkonidae</b>									
Geckoes									
<i>Christinus marmoratus</i>	Marbled Gecko			X			X		X
<b>Pygopodidae</b>									
Legless Lizards									
<i>Aprasia repens</i>	Sandplain Worm Lizard			X			X		X
<i>Lialis burtonis</i>	Burton's Legless Lizard			X			X	X	X
<b>Agamidae</b>									
Dragon Lizards									
<i>Pogona minor</i>	Western Bearded Dragon			X	X			X	X

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			<b>Scincidae</b> Skinks						
<i>Acritoscincus trilineatum</i>	Southwestern Cool Skink			X	X		X	X	
<i>Cryptoblepharus buchananii</i>	Fence Skink			X	X		X	X	X
<i>Ctenotus australis</i>	Western Ctenotus		X	X			X	X	X
<i>Ctenotus fallens</i>	West Coast Ctenotus			X					X
<i>Ctenotus impar</i>	Odd-striped Ctenotus								X
<i>Egernia kingii</i>	King's Skink								X
<i>Egernia napoleonis</i>	Salmon-bellied Skink			X					X
<i>Hemiergus quadrilineata</i>	Two-toed Mulch Skink			X	X				X
<i>Lerista elegans</i>	West Coast Four-toed Lerista			X	X		X	X	X
<i>Lerista lineata</i>	Perth Lined Lerista	P3		X					X
<i>Menetia greyii</i>	Dwarf Skink			X	X		X	X	X
<i>Morethia lineocellata</i>	West Coast Pale-flecked Morethia			X			X		X
<i>Tiliqua rugosa</i>	Bobtail			X	X	X	X	X	X
<b>Typhlopidae</b> Blind Snakes									
<i>Ramphotyphlops australis</i>	Southern Blind Snake						X		

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Class	Common	Conservation	A	B	C	D	E	F	G
Family	Name	Status							
Species									
<b>Elapidae</b>									
Elapid Snakes									
<i>Notechis scutatus</i>	Tiger Snake			X			X	X	X
<i>Pseudonaja affinis</i>	Dugite			X	X		X	X	X
<b>Aves</b>									
<b>Phasianidae</b>									
Quails, Pheasants									
<i>Coturnix pectoralis</i>	Stubble Quail	LC	X					X	X
<i>Coturnix ypsilophora</i>	Brown Quail	LC			X		X		X

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			<b>Anatidae</b> Geese, Swans, Ducks						
<i>Anas castanea</i>	Chestnut Teal	LC		X					X
<i>Anas gracilis</i>	Grey Teal	LC		X			X	X	X
<i>Anas platyrhynchos</i>	Mallard	Introduced						X	X
<i>Anas rhynchotis</i>	Australasian Shoveler	Bh LC		X					X
<i>Anas superciliosa</i>	Pacific Black Duck	LC	X	X	X	X	X	X	X
<i>Aythya australis</i>	Hardhead	Bh LC							X
<i>Biziura lobata</i>	Musk Duck	Bh LC		X					X
<i>Chenonetta jubata</i>	Australian Wood Duck	LC				X	X	X	X
<i>Cygnus atratus</i>	Black Swan	LC		X					X
<i>Malacorhynchus membranaceus</i>	Pink-eared Duck	Bh LC		X					X
<i>Tadorna tadornoides</i>	Australian Shelduck	LC		X		X	X	X	X
<b>Podicipedidae</b> Grebes									
<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe	LC		X					X
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe	LC	X						X

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<b>Phalacrocoracidae</b>									
Cormorants									
<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant	LC		X					X
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	LC							X
<b>Pelecanidae</b>									
Pelicans									
<i>Pelecanus conspicillatus</i>	Australian Pelican	LC		X					X
<b>Ardeidae</b>									
Hérons, Egrets, Bitterns									
<i>Ardea alba</i>	Great Egret	CA JA		X					
<i>Ardea garzetta</i>	Little Egret	LC							X
<i>Ardea ibis</i>	Cattle Egret	CA JA							X
<i>Ardea novaehollandiae</i>	White-faced Heron	LC	X	X			X	X	X
<i>Ardea pacifica</i>	White-necked Heron	LC					X	X	X
<i>Nycticorax caledonicus</i>	Rufous Night Heron	Bp LC		X					X
<b>Threskiornithidae</b>									
Ibises, Spoonbills									
<i>Platalea flavipes</i>	Yellow-billed Spoonbill	LC		X				X	X
<i>Threskiornis molucca</i>	Australian White Ibis	LC		X	X		X	X	
<i>Threskiornis spinicollis</i>	Straw-necked Ibis	LC	X	X	X	X		X	X

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			<b>Accipitridae</b> Kites, Goshawks, Eagles, Harriers						
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	Bp LC			X				X
<i>Accipiter fasciatus</i>	Brown Goshawk	Bp LC		X				X	X
<i>Aquila audax</i>	Wedge-tailed Eagle	Bp LC		X				X	X
<i>Aquila morphnoides</i>	Little Eagle	Bp LC			X				
<i>Circus approximans</i>	Swamp Harrier	LC		X					X
<i>Circus assimilis</i>	Spotted Harrier	LC							X
<i>Elanus caeruleus</i>	Black-shouldered Kite	LC		X	X			X	X
<i>Haliastur sphenurus</i>	Whistling Kite	Bp LC		X			X		X
<i>Hamirostra isura</i>	Square-tailed Kite	Bp LC							
<b>Falconidae</b> Falcons									
<i>Falco berigora</i>	Brown Falcon	Bp LC					X		X
<i>Falco cenchroides</i>	Australian Kestrel	LC	X	X	X	X	X	X	X
<i>Falco longipennis</i>	Australian Hobby	LC		X	X				X
<i>Falco peregrinus</i>	Peregrine Falcon	S7 Bp LC							X

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			<b>Rallidae</b> Rails, Crakes, Swampheens, Coots						
<i>Fulica atra</i>	Eurasian Coot	LC		X					X
<i>Gallinula tenebrosa</i>	Dusky Moorhen	Bh LC		X					X
<i>Gallinula ventralis</i>	Black-tailed Native-hen	LC		X					
<i>Gallirallus philippensis</i>	Buff-banded Rail	LC							X
<i>Porphyrio porphyrio</i>	Purple Swampheens	LC	X	X					X
<b>Turnicidae</b> Button-quails									
<i>Turnix varia</i>	Painted Button-quail	Bp LC							
<b>Recurvirostridae</b> Stilts, Avocets									
<i>Himantopus himantopus</i>	Black-winged Stilt	LC		X					X
<b>Charadriidae</b> Lapwings, Plovers, Dotterels									
<i>Charadrius melanops</i>	Black-fronted Dotterel	LC	X	X					
<i>Vanellus tricolor</i>	Banded Lapwing	LC				X			X
<b>Laridae</b> Gulls, Terns									
<i>Larus novaehollandiae</i>	Silver Gull	LC		X					X

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<b>Columbidae</b> Pigeons, Doves									
<i>Columba livia</i>	Domestic Pigeon	Introduced		X				X	X
<i>Ocyphaps lophotes</i>	Crested Pigeon	LC	X	X	X	X	X	X	X
<i>Phaps chalcoptera</i>	Common Bronzewing	Bh LC	X		X	X	X	X	X
<i>Streptopelia chinensis</i>	Spotted Turtle-Dove	Introduced		X	X		X	X	X
<i>Streptopelia senegalensis</i>	Laughing Turtle-Dove	Introduced	X	X	X	X	X	X	X

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			<b>Psittacidae</b> Parrots						
<i>Cacatua roseicapilla</i>	Galah	LC	X	X	X	X	X	X	X
<i>Cacatua sanguinea</i>	Little Corella	LC		X	X			X	X
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo	S3 VU Bp LC	X	X	X		X	X	X
<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		X	X		X	X	X
<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet	LC							
<i>Neophema elegans</i>	Elegant Parrot	LC		X			X		X
<i>Platycercus icterotis icterotis</i>	Western Rosella (western ssp)	Bp LC							X
<i>Platycercus spurius</i>	Red-capped Parrot	LC		X	X	X	X	X	X
<i>Platycercus zonarius</i>	Australian Ringneck	LC		X	X				X
<i>Platycercus zonarius semitorquatus</i>	Australian Ringneck Parrot	LC	X			X	X	X	
<i>Polytelis anthopeplus</i>	Regent Parrot	LC					X		X
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Introduced	X	X	X	X	X	X	X

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			<b>Cuculidae</b> Parasitic Cuckoos						
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo	LC			X		X		X
<i>Chrysococcyx basalus</i>	Horsfield's Bronze Cuckoo	LC			X	X	X	X	
<i>Chrysococcyx lucidus</i>	Shining Bronze Cuckoo	LC		X	X	X	X	X	X
<i>Cuculus pallidus</i>	Pallid Cuckoo	LC				X			
<b>Strigidae</b> Hawk Owls									
<i>Ninox novaeseelandiae</i>	Boobook Owl	LC		X			X		
<b>Tytonidae</b> Barn Owls									
<i>Tyto alba</i>	Barn Owl	LC					X		X
<b>Podargidae</b> Frogmouths									
<i>Podargus strigoides</i>	Tawny Frogmouth	LC					X		X
<b>Caprimulgidae</b> Nightjars									
<i>Eurostopodus argus</i>	Spotted Nightjar	LC							X
<b>Aegothelidae</b> Owlet-nightjars									
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	LC		X					X

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<b>Halcyonidae</b>									
Tree Kingfishers									
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Introduced		X			X	X	X
<i>Todiramphus sanctus</i>	Sacred Kingfisher	LC		X			X	X	X
<b>Meropidae</b>									
Bee-eaters									
<i>Merops ornatus</i>	Rainbow Bee-eater	JA LC		X			X	X	X
<b>Maluridae</b>									
Fairy Wrens, GrassWrens									
<i>Malurus splendens</i>	Splendid Fairy-wren	Bh LC	X	X	X	X	X	X	X
<b>Acanthizidae</b>									
Thornbills, Geryones, Fieldwrens & Whitefaces									
<i>Acanthiza apicalis</i>	Broad-tailed Thornbill	Bh LC	X	X		X	X	X	X
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	Bh LC		X	X	X	X	X	X
<i>Gerygone fusca</i>	Western Gerygone	LC	X	X	X	X	X	X	X
<i>Sericornis frontalis</i>	White-browed Scrubwren	Bh LC		X		X	X	X	X
<i>Smicrornis brevirostris</i>	Weebill	Bh LC	X	X		X	X		X
<b>Pardalotidae</b>									
Pardalotes									
<i>Pardalotus punctatus</i>	Spotted Pardalote	LC		X					X
<i>Pardalotus striatus</i>	Striated Pardalote	LC		X	X		X	X	X

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			<b>Meliphagidae</b> Honeyeaters, Chats						
<i>Acanthorhynchus superciliosus</i>	Western Spinebill	LC		X	X	X		X	X
<i>Anthochaera carunculata</i>	Red Wattlebird	LC	X	X	X	X	X	X	X
<i>Anthochaera lunulata</i>	Western Little Wattlebird	Bp LC		X	X	X	X	X	X
<i>Epthianura albigrons</i>	White-fronted Chat	LC			X				X
<i>Lichenostomus virescens</i>	Singing Honeyeater	LC	X	X	X	X	X	X	
<i>Lichmera indistincta</i>	Brown Honeyeater	LC	X	X	X	X	X	X	X
<i>Manorina flavigula</i>	Yellow-throated Miner	LC							X
<i>Phylidonyris melanops</i>	Tawny-crowned Honeyeater	Bp LC				X			
<i>Phylidonyris nigra</i>	White-cheeked Honeyeater	Bp LC		X	X	X		X	
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	Bp LC	X	X	X	X		X	X
<b>Petroicidae</b> Australian Robins									
<i>Microeca fascinans</i>	Jacky Winter	LC							X
<i>Petroica multicolor</i>	Scarlet Robin	Bh LC					X		
<b>Neosittidae</b> Sitellas									
<i>Daphoenositta chrysoptera</i>	Varied Sittella	Bh LC		X					X

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<b>Pachycephalidae</b>									
Crested Shrike-tit, Crested Bellbird, Shrike Thrushes, Whistlers									
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	Bh LC		X	X	X	X	X	X
<i>Pachycephala pectoralis</i>	Golden Whistler	Bh LC			X	X			
<i>Pachycephala rufiventris</i>	Rufous Whistler	LC		X	X	X	X	X	X
<b>Dicruridae</b>									
Monarchs, Magpie Lark, Flycatchers, Fantails, Drongo									
<i>Grallina cyanoleuca</i>	Magpie-lark	LC	X	X	X	X	X	X	X
<i>Rhipidura fuliginosa</i>	Grey Fantail	LC	X	X		X	X	X	
<i>Rhipidura leucophrys</i>	Willie Wagtail	LC	X	X	X	X	X	X	X
<b>Campephagidae</b>									
Cuckoo-shrikes, Trillers									
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	LC		X	X	X	X	X	X
<i>Lalage tricolor</i>	White-winged Triller	LC					X	X	
<b>Artamidae</b>									
Woodswallows, Butcherbirds, Currawongs									
<i>Artamus cinereus</i>	Black-faced Woodswallow	Bp LC						X	X
<i>Artamus cyanopterus</i>	Dusky Woodswallow	Bp LC		X					X

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<b>Cracticidae</b>									
Currawongs, Magpies & Butcherbirds									
<i>Cracticus tibicen</i>	Australian Magpie	LC	X	X	X	X	X	X	X
<i>Cracticus torquatus</i>	Grey Butcherbird	LC	X	X	X	X	X	X	X
<b>Corvidae</b>									
Ravens, Crows									
<i>Corvus coronoides</i>	Australian Raven	LC	X	X	X	X	X	X	X
<b>Motacillidae</b>									
Old World Pipits, Wagtails									
<i>Anthus australis</i>	Australian Pipit	LC				X	X		
<b>Dicaeidae</b>									
Flowerpeckers									
<i>Dicaeum hirundinaceum</i>	Mistletoebird	LC					X		X
<b>Hirundinidae</b>									
Swallows, Martins									
<i>Hirundo ariel</i>	Fairy Martin	LC							
<i>Hirundo neoxena</i>	Welcome Swallow	LC		X			X	X	X
<i>Hirundo nigricans</i>	Tree Martin	LC		X	X	X	X	X	

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

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G
			<b>Sylviidae</b> Old World Warblers						
<i>Acrocephalus australis</i>	Australian Reed Warbler	LC		X					X
<i>Cincloramphus cruralis</i>	Brown Songlark	LC							
<i>Cincloramphus mathewsi</i>	Rufous Songlark	LC							
<i>Megalurus gramineus</i>	Little Grassbird	LC							X
<b>Zosteropidae</b> White-eyes									
<i>Zosterops lateralis</i>	Silvereye	LC	X	X	X	X	X	X	X
<b>Mammalia</b>									
<b>Peramelidae</b> Bandicoots									
<i>Isodon fusciventer</i>	Quenda	P4 LC		X	X	X	X	X	X
<b>Molossidae</b> Freetail Bats									
<i>Austronomus australis</i>	White-striped Freetail-bat	LC		X	X				
<i>Ozimops kitcheneri</i>	South Western Freetail Bat	LC		X					

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

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

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix 1 and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

# **APPENDIX C**

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

# NatureMap - Piara Waters

Created By Greg Harewood on 18/04/2018

**Kingdom** Animalia  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Method** 'By Circle'  
**Centre** 115° 54' 19" E, 32° 07' 44" S  
**Buffer** 10km  
**Group By** Species Group

Species Group	Species	Records
Amphibian	11	922
Bird	243	63079
Fish	13	13
Invertebrate	115	643
Mammal	28	1512
Reptile	61	1815
<b>TOTAL</b>	<b>471</b>	<b>67984</b>

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
<b>Amphibian</b>				
1.	25398 <i>Crinia georgiana</i> (Quacking Frog)			
2.	25399 <i>Crinia glauerti</i> (Clicking Frog)			
3.	25400 <i>Crinia insignifera</i> (Squelching Froglet)			
4.	25404 <i>Geocrinia leai</i> (Ticking Frog)			
5.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
6.	25412 <i>Heleioporus psammophilus</i> (Sand Frog)			
7.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
8.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
9.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
10.	25420 <i>Myobatrachus gouldii</i> (Turtle Frog)			
11.	25433 <i>Pseudophryne guentheri</i> (Crawling Toadlet)			
<b>Bird</b>				
12.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
13.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
14.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
15.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
16.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
17.	24281 <i>Accipiter cirrocephalus</i> subsp. <i>cirrocephalus</i> (Collared Sparrowhawk)			
18.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
19.	24283 <i>Accipiter fasciatus</i> subsp. <i>didimus</i> (Brown Goshawk)			
20.	24282 <i>Accipiter fasciatus</i> subsp. <i>fasciatus</i> (Brown Goshawk)			
21.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
22.	24831 <i>Acrocephalus australis</i> subsp. <i>gouldi</i> (Australian Reed Warbler)			
23.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
24.	25544 <i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
25.	24301 <i>Aegotheles cristatus</i> subsp. <i>cristatus</i> (Australian Owlet-nightjar)			
26.	24310 <i>Anas castanea</i> (Chestnut Teal)			
27.	24312 <i>Anas gracilis</i> (Grey Teal)			
28.	24313 <i>Anas platyrhynchos</i> (Mallard)			
29.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
30.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
31.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
32.	<i>Anser anser</i>			
33.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
34.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
35.	25554 <i>Apus pacificus</i> (Fork-tailed Swift, Pacific Swift)		IA	
36.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
37.	24337 <i>Ardea garzetta</i> subsp. <i>nigripes</i> (Little Egret)			
38.	25558 <i>Ardea ibis</i> (Cattle Egret)		IA	
39.	41324 <i>Ardea modesta</i> (great egret, white egret)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
			IA	
40.	24340 <i>Ardea novaehollandiae</i> (White-faced Heron)			
41.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
42.	25736 <i>Arenaria interpres</i> (Ruddy Turnstone)		IA	
43.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
44.	24352 <i>Artamus cinereus</i> subsp. <i>melanops</i> (Black-faced Woodswallow)			
45.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
46.	<i>Artamus sordidus</i>			
47.	24318 <i>Aythya australis</i> (Hardhead)			
48.	<i>Barnardius zonarius</i>			
49.	24319 <i>Biziura lobata</i> (Musk Duck)			
50.	24345 <i>Botaurus poiciloptilus</i> (Australasian Bittern)		T	
51.	24359 <i>Burhinus grallarius</i> (Bush Stone-curlew)			
52.	25713 <i>Cacatua galerita</i> (Sulphur-crested Cockatoo)			
53.	25714 <i>Cacatua pastinator</i> (Western Long-billed Corella)			
54.	25715 <i>Cacatua roseicapilla</i> (Galah)			
55.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
56.	24729 <i>Cacatua tenuirostris</i> (Eastern Long-billed Corella)	Y		
57.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
58.	24427 <i>Cacomantis flabelliformis</i> subsp. <i>flabelliformis</i> (Fan-tailed Cuckoo)			
59.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
60.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
61.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
62.	24786 <i>Calidris melanotos</i> (Pectoral Sandpiper)		IA	
63.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
64.	24789 <i>Calidris subminuta</i> (Long-toed Stint)		IA	
65.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
66.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black-Cockatoo)		T	
67.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)		T	
68.	48400 <i>Calyptorhynchus</i> sp. (white-tailed black cockatoo)		T	
69.	25574 <i>Charadrius dubius</i> (Little Ringed Plover)		IA	
70.	25575 <i>Charadrius leschenaultii</i> (Greater Sand Plover)		IA	
71.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
72.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
73.	47909 <i>Cheramoeca leucosterna</i> (White-backed Swallow)			
74.	41332 <i>Chlidonias leucopterus</i> (White-winged Black Tern)		IA	
75.	<i>Chroicocephalus novaehollandiae</i>			
76.	25601 <i>Chrysococcyx lucidus</i> (Shining Bronze Cuckoo)			
77.	24432 <i>Chrysococcyx lucidus</i> subsp. <i>plagosus</i> (Shining Bronze Cuckoo)			
78.	24288 <i>Circus approximans</i> (Swamp Harrier)			
79.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
80.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
81.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
82.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
83.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
84.	24362 <i>Coracina novaehollandiae</i> subsp. <i>novaehollandiae</i> (Black-faced Cuckoo-shrike)			
85.	24363 <i>Coracina novaehollandiae</i> subsp. <i>subpallida</i> (Black-faced Cuckoo-shrike)			
86.	24416 <i>Corvus bennetti</i> (Little Crow)			
87.	25592 <i>Corvus coronoides</i> (Australian Raven)			
88.	24417 <i>Corvus coronoides</i> subsp. <i>perplexus</i> (Australian Raven)			
89.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			
90.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
91.	24673 <i>Coturnix ypsilophora</i> subsp. <i>australis</i> (Brown Quail)			
92.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
93.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
94.	24422 <i>Cracticus tibicen</i> subsp. <i>dorsalis</i> (White-backed 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.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
100.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
101.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
102.	<i>Egretta garzetta</i>			
103.	<i>Egretta novaehollandiae</i>			
104.	<i>Elanus axillaris</i>			
105.	25540 <i>Elanus caeruleus</i> (Black-shouldered Kite)			
106.	24290 <i>Elanus caeruleus</i> subsp. <i>axillaris</i> (Australian Black-shouldered Kite)			
107.	47937 <i>Eiseyornis melanops</i> (Black-fronted Dotterel)			



Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
108.	<i>Eolophus roseicapillus</i>			
109.	24652 <i>Eopsaltria georgiana</i> (White-breasted Robin)			
110.	24567 <i>Epthianura albifrons</i> (White-fronted Chat)			
111.	24379 <i>Erythronyctes alpinus</i> (Red-kneed Dotterel)			
112.	24368 <i>Eurostopodus argus</i> (Spotted Nightjar)			
113.	25621 <i>Falco berigora</i> (Brown Falcon)			
114.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
115.	24472 <i>Falco cenchroides</i> subsp. <i>cenchrus</i> (Australian Kestrel, Nankeen Kestrel)			
116.	25623 <i>Falco longipennis</i> (Australian Hobby)			
117.	24474 <i>Falco longipennis</i> subsp. <i>longipennis</i> (Australian Hobby)			
118.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
119.	24475 <i>Falco peregrinus</i> subsp. <i>macropus</i> (Australian Peregrine Falcon)		S	
120.	25727 <i>Fulica atra</i> (Eurasian Coot)			
121.	24761 <i>Fulica atra</i> subsp. <i>australis</i> (Eurasian Coot)			
122.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
123.	24763 <i>Gallinula tenebrosa</i> subsp. <i>tenebrosa</i> (Dusky Moorhen)			
124.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			
125.	<i>Gallus gallus</i>			
126.	47954 <i>Gelochelidon nilotica</i> (Gull-billed Tern)		IA	
127.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
128.	24271 <i>Gerygone fusca</i> subsp. <i>fusca</i> (Western Gerygone)			
129.	47962 <i>Glyciphila melanops</i> (Tawny-crowned Honeyeater)			
130.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
131.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
132.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
133.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
134.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
135.	24775 <i>Himantopus himantopus</i> subsp. <i>leucocephalus</i> (Black-winged Stilt)			
136.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
137.	<i>Hydroprogne caspia</i>			
138.	47975 <i>Ixobrychus dubius</i> (Australian Little Bittern)		P4	
139.	25637 <i>Larus novaehollandiae</i> (Silver Gull)			
140.	24511 <i>Larus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Silver Gull)			
141.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
142.	24582 <i>Lichmera indistincta</i> subsp. <i>indistincta</i> (Brown Honeyeater)			
143.	25741 <i>Limosa limosa</i> (Black-tailed Godwit)		IA	
144.	25683 <i>Lonchura castaneothorax</i> (Chestnut-breasted Mannikin)			
145.	<i>Lophoictinia isura</i>			
146.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
147.	25650 <i>Malurus elegans</i> (Red-winged Fairy-wren)			
148.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
149.	25652 <i>Malurus leucopterus</i> (White-winged Fairy-wren)			
150.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
151.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
152.	25758 <i>Megalurus gramineus</i> (Little Grassbird)			
153.	47997 <i>Melanodryas cucullata</i> (Hooded Robin)			
154.	25663 <i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
155.	24587 <i>Melithreptus chloropsis</i> (Western White-naped Honeyeater)			
156.	24736 <i>Melospiza undulata</i> (Budgerigar)			
157.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)		IA	
158.	<i>Microcarbo melanoleucos</i>			
159.	25693 <i>Microeca fascinans</i> (Jacky Winter)			
160.	25542 <i>Milvus migrans</i> (Black Kite)			
161.	25610 <i>Myiagra inquieta</i> (Restless Flycatcher)			
162.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
163.	25747 <i>Ninox connivens</i> (Barking Owl)			
164.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
165.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
166.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
167.	24328 <i>Oxyura australis</i> (Blue-billed Duck)		P4	
168.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
169.	24624 <i>Pachycephala rufiventris</i> subsp. <i>rufiventris</i> (Rufous Whistler)			
170.	<i>Pandion cristatus</i>			
171.	25543 <i>Pandion haliaetus</i> (Osprey)		IA	
172.	24299 <i>Pandion haliaetus</i> subsp. <i>cristatus</i> (Osprey)		IA	
173.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
174.	24625 <i>Pardalotus punctatus</i> subsp. <i>punctatus</i> (Spotted Pardalote)			
175.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
176.	24628 <i>Pardalotus striatus</i> subsp. <i>murchisoni</i> (Striated Pardalote)			
177.	24630 <i>Pardalotus striatus</i> subsp. <i>westraliensis</i> (Striated Pardalote)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
178.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
179.	48060 <i>Petrochelidon ariel</i> (Fairy Martin)			
180.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
181.	48066 <i>Petroica boodang</i> (Scarlet Robin)			
182.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
183.	24663 <i>Phaethon rubricauda</i> (Red-tailed Tropicbird)		P4	
184.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
185.	24665 <i>Phalacrocorax fuscescens</i> (Black-faced 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.	24747 <i>Platycercus spurius</i> (Red-capped Parrot)			
197.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
198.	24750 <i>Platycercus zonarius</i> subsp. <i>semitorquatus</i> (Twenty-eight Parrot)			
199.	24843 <i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
200.	24382 <i>Pluvialis fulva</i> (Pacific Golden Plover)		IA	
201.	24383 <i>Pluvialis squatarola</i> (Grey Plover)		IA	
202.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
203.	24679 <i>Podargus strigoides</i> subsp. <i>brachypterus</i> (Tawny Frogmouth)			
204.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
205.	24681 <i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
206.	25722 <i>Polytelis anthopeplus</i> (Regent Parrot)			
207.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
208.	24767 <i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)			
209.	24769 <i>Porzana fluminea</i> (Australian Spotted Crane)			
210.	25732 <i>Porzana pusilla</i> (Baillon's Crane)			
211.	24770 <i>Porzana pusilla</i> subsp. <i>palustris</i> (Baillon's Crane)			
212.	24771 <i>Porzana tabuensis</i> (Spotless Crane)			
213.	48085 <i>Ptilinopus krameri</i> (Indian Ringnecked Parrot, Rose-ringed Parakeet)	Y		
214.	24702 <i>Pterodroma brevirostris</i> (Kerguelen Petrel)			
215.	24711 <i>Puffinus assimilis</i> subsp. <i>assimilis</i> (Little Shearwater)			
216.	<i>Purpureicephalus spurius</i>			
217.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
218.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
219.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
220.	24454 <i>Rhipidura leucophrys</i> subsp. <i>leucophrys</i> (Willie Wagtail)			
221.	48237 <i>Rostratula australis</i> (Australian Painted Snipe)		T	
222.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
223.	24279 <i>Sericornis frontalis</i> subsp. <i>maculatus</i> (White-browed Scrubwren)			
224.	30948 <i>Smicronis brevirostris</i> (Weebill)			
225.	24645 <i>Stagonopleura oculata</i> (Red-eared Firetail)			
226.	24516 <i>Stercorarius longicaudus</i> (long-tailed jaeger, long-tailed skua)		IA	
227.	24528 <i>Sterna hybrida</i> subsp. <i>javanica</i> (Whiskered Tern)			
228.	24329 <i>Stictonetta naevosa</i> (Freckled Duck)			
229.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
230.	24426 <i>Strepera versicolor</i> subsp. <i>plumbea</i> (Grey Currawong)			
231.	25589 <i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
232.	30951 <i>Streptopelia chinensis</i> subsp. <i>tigrina</i> (Spotted Turtle-Dove)	Y		
233.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
234.	30950 <i>Streptopelia senegalensis</i> subsp. <i>senegalensis</i> (Laughing Turtle-Dove)	Y		
235.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
236.	24682 <i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
237.	25552 <i>Tadorna radjah</i> (Radjah Shelduck)			
238.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
239.	48135 <i>Thinornis rubricollis</i> (Hooded Plover, Hooded Dotterel)		P4	
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	

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
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.	24852 <i>Tyto alba</i> subsp. <i>delicatula</i> (Barn Owl)			
251.	24855 <i>Tyto novaehollandiae</i> subsp. <i>novaehollandiae</i> (Masked Owl (southwest))		P3	
252.	25577 <i>Vanellus miles</i> (Masked Lapwing)			
253.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
254.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			

### Fish

255.	<i>Acentrogobius bifrenatus</i>			
256.	<i>Apogon rueppellii</i>			
257.	<i>Atherinomorus vaigiensis</i>			
258.	<i>Atherinosoma wallacei</i>			
259.	<i>Carassius auratus</i>			
260.	<i>Cnidogobius macrocephalus</i>			
261.	<i>Craterocephalus mugiloides</i>			
262.	34028 <i>Galaxias occidentalis</i> (Western Minnow)			
263.	<i>Pelates sexlineatus</i>			
264.	<i>Sillago burrus</i>			
265.	<i>Tandanus bostocki</i>			
266.	<i>Torquigener pleurogramma</i>			
267.	<i>Urocampus carinirostris</i>			

### Invertebrate

268.	<i>Acercella falcipes</i>			
269.	<i>Aganippe raphiduca</i>			
270.	<i>Akamptogonus novarae</i>			
271.	<i>Allothoreua maculata</i>			
272.	<i>Aname mainae</i>			
273.	<i>Aname tepperi</i>			
274.	<i>Ancylidae</i> sp.			
275.	<i>Arachnura higginsi</i>			
276.	<i>Araneus cyphoxis</i>			
277.	<i>Araneus eburneiventris</i>			
278.	<i>Araneus senicaudatus</i>			
279.	<i>Arkys walckenaeri</i>			
280.	<i>Arteria flavimana</i>			
281.	<i>Arteria linnaei</i>			
282.	<i>Arteria taenifera</i>			
283.	<i>Asadipus kunderang</i>			
284.	<i>Austracantha minax</i>			
285.	<i>Backbourkia heroine</i>			
286.	<i>Ballarra longipalpus</i>			
287.	<i>Caenidae</i> sp.			
288.	<i>Ceratopogonidae</i> sp.			
289.	<i>Cercophonius sulcatus</i>			
290.	<i>Ceryerda cursitans</i>			
291.	33939 <i>Cherax cainii</i> (Marron)			
292.	<i>Cherax destructor</i>			
293.	<i>Cherax preissii</i>			
294.	<i>Cherax quinquecarinatus</i>			
295.	<i>Cherax</i> sp.			
296.	<i>Chironominae</i> sp.			
297.	<i>Clynotis albobarbatus</i>			
298.	<i>Cormocephalus aurantiipes</i>			
299.	<i>Cormocephalus novaehollandiae</i>			
300.	<i>Cormocephalus rubriceps</i>			
301.	<i>Crustulina bicrucata</i>			
302.	<i>Cryptoerithus quobba</i>			
303.	<i>Cyrtophora parnasia</i>			
304.	<i>Dingosa serrata</i>			
305.	<i>Eodelena convexa</i>			
306.	<i>Eodelena lapidicola</i>			
307.	<i>Eriophora biapicata</i>			
308.	<i>Erythracarus decoris</i>			
309.	<i>Gea theridioides</i>			
310.	<i>Gyrinidae</i> sp.			
311.	<i>Henicops dentatus</i>			
312.	<i>Heurodes turritus</i>			
313.	<i>Hogna crispipes</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
314.	<i>Hydrophilidae</i> sp.			
315.	<i>Hydropsychidae</i> sp.			
316.	<i>Hydroptilidae</i> sp.			
317.	<i>Idiommata blackwalli</i>			
318.	<i>Isometroides vescus</i>			
319.	<i>Isopeda leishmanni</i>			
320.	<i>Ixodes australiensis</i>			
321.	<i>Kangarosa properipes</i>			
322.	<i>Lampona cylindrata</i>			
323.	<i>Latrodectus hasseltii</i>			
324.	33982 <i>Leioproctus contrarius</i> (short-tongued bee)		P3	
325.	33983 <i>Leioproctus douglasiellus</i> (short-tongued bee)		T	
326.	<i>Leptoceridae</i> sp.			
327.	<i>Longepi woodman</i>			
328.	<i>Lycosa ariadnae</i>			
329.	<i>Lycosa gilberta</i>			
330.	<i>Maratus pavonis</i>			
331.	<i>Marsupiopopus antechinus</i>			
332.	<i>Missulena granulosa</i>			
333.	<i>Missulena occatoria</i>			
334.	<i>Mituliodon tarantulinus</i>			
335.	<i>Mitzoruga insularis</i>			
336.	<i>Nanometa gentilis</i>			
337.	33984 <i>Neopasiphae simplicior</i> (short-tongued bee)		T	
338.	<i>Nephila edulis</i>			
339.	<i>Nicodamus mainae</i>			
340.	<i>Notiasemus glauerti</i>			
341.	<i>Oligochaeta</i> sp.			
342.	<i>Ommatoiulus moreleti</i>			
343.	<i>Ommatoiulus moreletii</i>			
344.	<i>Orthocladinae</i> sp.			
345.	<i>Oxidus gracilis</i>			
346.	<i>Palaemonidae</i> sp.			
347.	<i>Paralamyctes cammoensis</i>			Y
348.	<i>Parastacidae</i> sp.			
349.	<i>Phenasteron longiconductor</i>			
350.	<i>Pinkfloydia harveii</i>			
351.	<i>Piona cumberlandensis</i>			
352.	<i>Podykipus collinus</i>			
353.	<i>Poltys laciniosus</i>			
354.	<i>Prionosternum scutatatum</i>			
355.	<i>Raveniella cirrata</i>			
356.	<i>Raveniella peckorum</i>			
357.	<i>Scolopendra laeta</i>			
358.	<i>Servaea melaina</i>			
359.	<i>Simaetha tenuior</i>			
360.	<i>Simuliidae</i> sp.			
361.	<i>Smeringopus natalensis</i>			
362.	<i>Solaenodolichopus pruvoti</i>			
363.	<i>Steatoda capensis</i>			
364.	<i>Steatoda grossa</i>			
365.	<i>Supunna funerea</i>			
366.	<i>Supunna picta</i>			
367.	33992 <i>Synemon gratiosa</i> (Graceful Sunmoth)		P4	
368.	<i>Synothele michaelseni</i>			
369.	<i>Synothele rastelloides</i>			
370.	<i>Tamopsis darlingtoniana</i>			
371.	<i>Tasmanicosa leuckartii</i>			
372.	<i>Tetragnatha demissa</i>			
373.	<i>Tetragnatha nitens</i>			
374.	33994 <i>Throscodectes xiphos</i> (cricket)		P1	Y
375.	<i>Tinytrema yarra</i>			
376.	<i>Urodacus novaehollandiae</i>			
377.	<i>Urodacus planimanus</i>			
378.	<i>Venator immansueta</i>			
379.	<i>Venatrix pullastra</i>			
380.	34113 <i>Westralunio carteri</i> (Carter's Freshwater Mussel)		T	
381.	<i>Withius piger</i>			
382.	<i>Zachria flavicoma</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
<b>Mammal</b>				
383.	30883 <i>Canis lupus subsp. familiaris</i> (Dog)	Y		
384.	24086 <i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)			
385.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattled Bat)			
386.	24092 <i>Dasyurus geoffroi</i> (Chuditch, Western Quoll)		T	
387.	24189 <i>Falsistrellus mackenziei</i> (Western False Pipistrelle, Western Falsistrelle)		P4	
388.	24041 <i>Felis catus</i> (Cat)	Y		
389.	30916 <i>Funambulus pennanti</i> (Indian Palm Squirrel)	Y		
390.	24215 <i>Hydromys chrysogaster</i> (Water-rat, Rakali)		P4	
391.	25478 <i>Isodon obesulus</i> (Southern Brown Bandicoot)		P4	
392.	24153 <i>Isodon obesulus subsp. fusciventer</i> (Quenda, Southern Brown Bandicoot)		P4	
393.	24131 <i>Macropus eugenii subsp. derbianus</i> (Tammar Wallaby (WA subsp))		P4	
394.	24132 <i>Macropus fuliginosus</i> (Western Grey Kangaroo)			
395.	24133 <i>Macropus irma</i> (Western Brush Wallaby)		P4	
396.	24223 <i>Mus musculus</i> (House Mouse)	Y		
397.	24146 <i>Myrmecobius fasciatus</i> (Numbat, Walpurti)		T	
398.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			
399.	24085 <i>Oryctolagus cuniculus</i> (Rabbit)	Y		
400.	24243 <i>Rattus fuscipes</i> (Western Bush Rat)			
401.	24244 <i>Rattus norvegicus</i> (Brown Rat)	Y		
402.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
403.	24145 <i>Setonix brachyurus</i> (Quokka)		T	
404.	24111 <i>Sminthopsis gilberti</i> (Gilbert's Dunnart)			
405.	24207 <i>Tachyglossus aculeatus</i> (Short-beaked Echidna)			
406.	24167 <i>Tarsipes rostratus</i> (Honey Possum, Noolbenger)			
407.	25521 <i>Trichosurus vulpecula</i> (Common Brushtail Possum)			
408.	24158 <i>Trichosurus vulpecula subsp. vulpecula</i> (Common Brushtail Possum)			
409.	24206 <i>Vespadelus regulus</i> (Southern Forest Bat)			
410.	24040 <i>Vulpes vulpes</i> (Red Fox)	Y		
<b>Reptile</b>				
411.	25242 <i>Acanthophis antarcticus</i> (Southern Death Adder)		P3	
412.	42368 <i>Acritoscincus trilineatus</i> (Western Three-lined Skink)			
413.	44629 <i>Anilius australis</i>			
414.	24990 <i>Aprasia pulchella</i> (Granite Worm-lizard)			
415.	24991 <i>Aprasia repens</i> (Sand-plain Worm-lizard)			
416.	42380 <i>Brachyuropis fasciolatus subsp. fasciolatus</i> (Narrow-banded Shovel-nosed Snake)			
417.	42381 <i>Brachyuropis semifasciatus</i> (Southern Shovel-nosed Snake)			
418.	43380 <i>Chelodina colliei</i> (South-western Snake-necked Turtle)			
419.	24980 <i>Christinus marmoratus</i> (Marbled Gecko)			
420.	30893 <i>Cryptoblepharus buchananii</i>			
421.	25020 <i>Cryptoblepharus plagiocephalus</i>			
422.	30899 <i>Ctenophorus adelaidensis</i> (Southern Heath Dragon, Western Heath Dragon)			
423.	25027 <i>Ctenotus australis</i>			
424.	25035 <i>Ctenotus delli</i> (Dell's skink, Dell's Ctenotus)		P4	
425.	25039 <i>Ctenotus fallens</i>			
426.	25040 <i>Ctenotus gemmula</i> (Jewelled South-west Ctenotus (Swan Coastal Plain pop P3), skink)			
427.	25047 <i>Ctenotus impar</i>			
428.	25049 <i>Ctenotus labillardieri</i>			
429.	41641 <i>Ctenotus ora</i> (Coastal Plains Skink)		P3	
430.	25766 <i>Delma fraseri</i> (Fraser's Legless Lizard)			
431.	24999 <i>Delma grayii</i>			
432.	25468 <i>Demansia psammophis</i> (Yellow-faced Whipsnake)			
433.	25296 <i>Demansia psammophis subsp. reticulata</i> (Yellow-faced Whipsnake)			
434.	24939 <i>Diplodactylus polyophthalmus</i>			
435.	25251 <i>Echiopsis curta</i> (Bardick)			
436.	25096 <i>Egernia kingii</i> (King's Skink)			
437.	25100 <i>Egernia napoleonis</i>			
438.	25250 <i>Elapognathus coronatus</i> (Crowned Snake)			
439.	24959 <i>Gehyra variegata</i>			
440.	25115 <i>Hemiergis initialis subsp. initialis</i>			
441.	25119 <i>Hemiergis quadrilineata</i>			
442.	25131 <i>Lerista distinguenda</i>			
443.	25133 <i>Lerista elegans</i>			
444.	25147 <i>Lerista lineata</i> (Perth Slider, Lined Skink)		P3	
445.	25005 <i>Lialis burtonis</i>			
446.	25184 <i>Menetia greyii</i>			
447.	25240 <i>Morelia spilota subsp. imbricata</i> (Carpet Python)			
448.	25191 <i>Morethia lineocellata</i>			
449.	25192 <i>Morethia obscura</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
450.	25248 <i>Neelaps bimaculatus</i> (Black-naped Snake)			
451.	25249 <i>Neelaps calonotos</i> (Black-striped Snake, black-striped burrowing snake)		P3	
452.	25252 <i>Notechis scutatus</i> (Tiger Snake)			
453.	25253 <i>Parasuta gouldii</i>			
454.	25255 <i>Parasuta nigriceps</i>			
455.	25509 <i>Pletholax gracilis</i> (Keeled Legless Lizard)			
456.	25007 <i>Pletholax gracilis</i> subsp. <i>gracilis</i> (Keeled Legless Lizard)			
457.	25510 <i>Pogona minor</i> (Dwarf Bearded Dragon)			
458.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
459.	25261 <i>Pseudechis australis</i> (Mulga Snake)			
460.	25511 <i>Pseudonaja affinis</i> (Dugite)			
461.	25259 <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
462.	42416 <i>Pseudonaja mengdeni</i> (Western Brown Snake)			
463.	25008 <i>Pygopus lepidopodus</i> (Common Scaly Foot)			
464.	25266 <i>Simoselaps bertholdi</i> (Jan's Banded Snake)			
465.	25203 <i>Tiliqua occipitalis</i> (Western Bluetongue)			
466.	25519 <i>Tiliqua rugosa</i>			
467.	25204 <i>Tiliqua rugosa</i> subsp. <i>aspera</i>			
468.	25207 <i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			
469.	24983 <i>Underwoodisaurus milii</i> (Barking Gecko)			
470.	25218 <i>Varanus gouldii</i> (Bungarra or Sand Monitor)			
471.	25225 <i>Varanus rosenbergi</i> (Heath 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

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



# EPBC Act Protected Matters Report

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

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

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

Report created: 26/05/18 15:09:05

[Summary](#)

[Details](#)

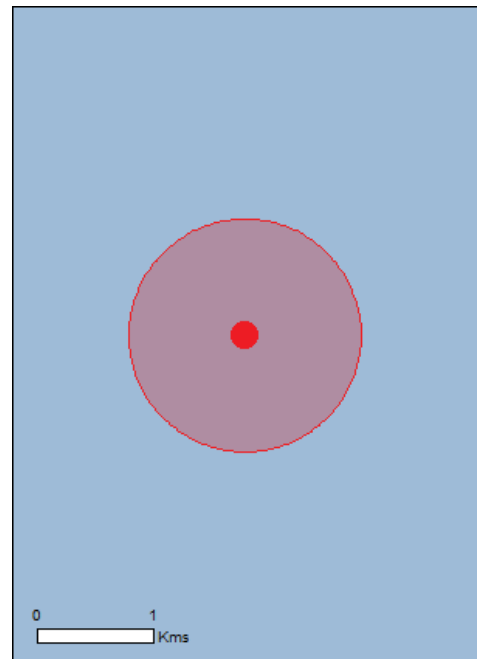
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

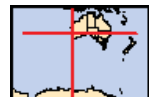
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Buffer: 1.0Km



# Summary

## Matters of National Environmental Significance

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

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	1
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	1
<a href="#">Listed Threatened Species:</a>	17
<a href="#">Listed Migratory Species:</a>	9

## Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	15
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Commonwealth Reserves Marine:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	None
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	38
<a href="#">Nationally Important Wetlands:</a>	1
<a href="#">Key Ecological Features (Marine)</a>	None



# Details

## Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[ Resource Information ]
Name	Proximity
<a href="#">Forrestdale and thomsons lakes</a>	Within 10km of Ramsar

## Listed Threatened Ecological Communities [ Resource Information ]

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

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

## Listed Threatened Species [ Resource Information ]

Name	Status	Type of Presence
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### Birds

<a href="#">Botaurus poiciloptilus</a> Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
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<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
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<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area
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<a href="#">Calyptorhynchus baudinii</a> Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Endangered	Species or species habitat likely to occur within area
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<a href="#">Calyptorhynchus latirostris</a> Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
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<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
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<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
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<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
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### Mammals

<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
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<a href="#">Pseudocheirus occidentalis</a> Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat may occur within
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Name	Status	Type of Presence area
<b>Plants</b>		
<a href="#">Andersonia gracilis</a> Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
<a href="#">Caladenia huegelii</a> King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area
<a href="#">Diuris micrantha</a> Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Diuris purdiei</a> Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat likely to occur within area
<a href="#">Drakaea elastica</a> Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
<a href="#">Drakaea micrantha</a> Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Lepidosperma rostratum</a> Beaked Lepidosperma [14152]	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
<b>Migratory Marine Birds</b>		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat may occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
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## Other Matters Protected by the EPBC Act

Listed Marine Species		[ Resource Information ]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Breeding known to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species

Name	Threatened	Type of Presence
<a href="#">Pandion haliaetus</a> Osprey [952]		habitat may occur within area  Species or species habitat may occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
<a href="#">Thinornis rubricollis</a> Hooded Plover [59510]		Species or species habitat may occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

## Extra Information

### Invasive Species [\[ Resource Information \]](#)

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

Name	Status	Type of Presence
<b>Birds</b>		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
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
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

Name	Status	Type of Presence
<i>Sturnus vulgaris</i> Common Starling [389]		within area Species or species habitat likely to occur within area
<i>Turdus merula</i> Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
<b>Mammals</b>		
<i>Bos taurus</i> Domestic Cattle [16]		Species or species habitat likely to occur within area
<i>Canis lupus familiaris</i> Domestic Dog [82654]		Species or species habitat likely to occur within area
<i>Felis catus</i> Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
<i>Funambulus pennantii</i> Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
<i>Mus musculus</i> House Mouse [120]		Species or species habitat likely to occur within area
<i>Oryctolagus cuniculus</i> Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
<i>Rattus norvegicus</i> Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
<i>Rattus rattus</i> Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
<i>Vulpes vulpes</i> Red Fox, Fox [18]		Species or species habitat likely to occur within area
<b>Plants</b>		
<i>Anredera cordifolia</i> 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
<i>Asparagus aethiopicus</i> Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
<i>Asparagus asparagoides</i> Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
<i>Asparagus plumosus</i> Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
<i>Brachiaria mutica</i> Para Grass [5879]		Species or species habitat may occur within area
<i>Cenchrus ciliaris</i> Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
<i>Chrysanthemoides monilifera</i> Bitou Bush, Boneseed [18983]		Species or species

Name	Status	Type of Presence
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		habitat may occur within area  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] Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area  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
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		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
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
<b>Reptiles</b>		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Nationally Important Wetlands		[ Resource Information ]
Name		State
<a href="#">Gibbs Road Swamp System</a>		WA

# 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

-32.12921 115.90505

# Acknowledgements

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

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

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

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



# **APPENDIX D**

## **HABITAT TREE DETAILS**

## Habitat Trees (DBH &gt;50cm)

Datum = GDA94

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows
wpt001	50H	397230	6445663	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt002	50H	397243	6445675	Unknown Planted Non-endemic Eucalyptus	10-15	>50	0
wpt003	50H	397272	6445719	Jarrah	15-20	>50	0
wpt004	50H	397301	6445703	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt005	50H	397296	6445688	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt006	50H	397286	6445685	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt007	50H	397278	6445678	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt008	50H	397306	6445682	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt009	50H	397358	6445701	Flooded Gum	15-20	>50	0
wpt010	50H	397381	6445683	Flooded Gum	15-20	>50	0
wpt011	50H	397393	6445671	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt012	50H	397405	6445660	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt013	50H	397445	6445620	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt014	50H	397449	6445616	Flooded Gum	15-20	>50	0
wpt015	50H	397506	6445556	Flooded Gum	15-20	>50	0
wpt016	50H	397513	6445555	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt017	50H	397527	6445542	Flooded Gum	15-20	>50	0
wpt018	50H	397535	6445533	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt019	50H	397398	6445474	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt020	50H	397274	6445621	Tuart	20+	>50	0
wpt021	50H	396950	6445320	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt022	50H	396958	6445321	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt023	50H	396953	6445319	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt024	50H	396944	6445309	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt025	50H	396932	6445300	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt026	50H	396913	6445284	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt027	50H	397018	6445320	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt028	50H	397022	6445315	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt029	50H	397034	6445309	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt030	50H	397037	6445304	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt031	50H	397041	6445299	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt032	50H	397062	6445284	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt033	50H	397106	6445244	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt034	50H	397144	6445210	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt035	50H	397146	6445208	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt036	50H	397157	6445200	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt037	50H	397037	6444978	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt038	50H	396918	6445005	Coastal Blackbutt	10-15	>50	0
wpt039	50H	396932	6444964	Coastal Blackbutt	10-15	>50	0
wpt040	50H	396791	6445095	Dead Jarrah	15-20	>50	0
wpt041	50H	396752	6445099	Dead Jarrah	20+	>50	0
wpt042	50H	396784	6445172	Flooded Gum	15-20	>50	0
wpt043	50H	396817	6445161	Dead Jarrah	15-20	>50	0
wpt044	50H	396632	6444928	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt045	50H	396665	6444989	Tuart	20+	>50	0
wpt046	50H	396661	6444994	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt047	50H	396664	6445011	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows
wpt048	50H	396796	6444967	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt049	50H	396847	6444868	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt050	50H	396837	6444830	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt051	50H	396767	6444835	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt052	50H	396775	6444822	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt053	50H	396927	6444871	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt054	50H	396880	6444760	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt055	50H	396846	6444723	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt056	50H	396783	6444758	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt057	50H	396766	6444685	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt058	50H	396766	6444682	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt059	50H	396748	6444700	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt060	50H	396742	6444692	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt061	50H	396700	6444731	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt062	50H	396743	6444753	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt063	50H	396717	6444806	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt064	50H	396795	6444584	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt065	50H	396846	6444567	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt066	50H	396920	6444695	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt067	50H	396967	6444761	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt068	50H	396931	6444809	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt069	50H	396957	6444661	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt070	50H	396959	6444634	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt071	50H	396982	6444632	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt072	50H	396861	6444532	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt073	50H	396854	6444498	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt074	50H	396829	6444532	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt075	50H	396809	6444531	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt076	50H	396792	6444525	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt077	50H	396786	6444539	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt078	50H	396753	6444542	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt079	50H	396645	6444497	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt080	50H	396725	6444418	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt081	50H	396742	6444459	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt082	50H	396754	6444488	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt083	50H	396775	6444463	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt084	50H	396553	6444576	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt085	50H	396608	6444850	Tuart	20+	>50	0
wpt086	50H	396737	6443695	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt087	50H	396716	6443713	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt088	50H	396702	6443758	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt089	50H	396701	6443763	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt090	50H	396692	6443775	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt091	50H	396710	6443778	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt092	50H	396730	6443789	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt093	50H	396750	6443792	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt094	50H	396816	6443894	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt095	50H	396822	6443918	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt096	50H	396785	6443917	Unknown Planted Non-endemic Eucalyptus	20+	>50	0

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows
wpt097	50H	396682	6443934	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt098	50H	396690	6443933	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt099	50H	396679	6443907	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt100	50H	396674	6443890	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt102	50H	396693	6443871	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt104	50H	396701	6443884	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt105	50H	396670	6443865	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt106	50H	396665	6443857	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt107	50H	396676	6443852	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt108	50H	396673	6443852	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt109	50H	396665	6443862	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt110	50H	396762	6443853	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt111	50H	396753	6444345	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt112	50H	396734	6444373	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt113	50H	396704	6444357	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt114	50H	396695	6444365	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt115	50H	396468	6444362	Dead Unknown	20+	>50	0
wpt116	50H	396413	6444438	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt117	50H	396598	6444295	Dead Unknown	20+	>50	0
wpt118	50H	396449	6443695	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt119	50H	396453	6443695	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt120	50H	396463	6443710	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt121	50H	396481	6443726	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt122	50H	396467	6443721	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt123	50H	396465	6443716	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt124	50H	396470	6443738	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt125	50H	396480	6443758	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt126	50H	396490	6443780	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt127	50H	396492	6443783	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt128	50H	396494	6443785	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt129	50H	396495	6443790	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt130	50H	396497	6443792	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt131	50H	396468	6443806	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt132	50H	396519	6443773	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt133	50H	396517	6443764	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt134	50H	396518	6443754	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt135	50H	396514	6443745	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt136	50H	396512	6443735	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt137	50H	396510	6443731	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt138	50H	396508	6443742	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt139	50H	396507	6443742	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt140	50H	396505	6443740	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt141	50H	396536	6443718	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt142	50H	396538	6443696	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt143	50H	396548	6443689	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt144	50H	396569	6443679	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt145	50H	396580	6443673	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt146	50H	396519	6443662	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt147	50H	396519	6443684	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows
wpt148	50H	396489	6443695	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt149	50H	396478	6443689	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt150	50H	396239	6443816	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt151	50H	396236	6443809	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt152	50H	396226	6443818	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt153	50H	396205	6443831	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt154	50H	396366	6444132	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt155	50H	396354	6444097	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt156	50H	396312	6444071	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt157	50H	396298	6444044	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt158	50H	396273	6443994	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt159	50H	396246	6443863	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt160	50H	396240	6443836	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt161	50H	396287	6443813	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt162	50H	396301	6443832	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt163	50H	396325	6443883	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt164	50H	396344	6443920	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt165	50H	396273	6443854	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt166	50H	396292	6443862	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt167	50H	396297	6443895	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt168	50H	396300	6443912	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt169	50H	396249	6443957	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt170	50H	396240	6443927	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt171	50H	396041	6443936	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt172	50H	396049	6443949	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt173	50H	396056	6443961	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt174	50H	396008	6443954	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt175	50H	396021	6443947	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt176	50H	396022	6443963	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt177	50H	396055	6444047	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt178	50H	396083	6444022	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt179	50H	396117	6443952	Unknown Planted Non-endemic Eucalyptus	20+	>50	0
wpt180	50H	396147	6444006	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt181	50H	396192	6443985	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt182	50H	396083	6443948	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0
wpt183	50H	396101	6444046	Unknown Planted Non-endemic Eucalyptus	15-20	>50	0

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

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