

# Fauna Assessment



## Kingston Drive Extension (CPS 7900/1) Australind

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V1

***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.

**mm:** Millimetre.

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

**POS:** Public Open Space.

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

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

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

**SRE:** Short Range Endemic.

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

**WA:** Western Australia.

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

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

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

**WRP:** Western Ringtail Possum.

## SUMMARY

This report details the results of a fauna assessment of the Shire of Harvey's (the Shire) proposed extension of Kingston Drive from Paris Road to Grand Boulevard (the subject site). The Shire has applied for a clearing permit (CPS 7900/1) so as to allow for clearing of the vegetation prior to the road's construction. The permit area covers about 2.08 ha and is mostly covered by native remnant.

The scope of works was to conduct a level 1 fauna survey as defined by the Environmental Protection Authority (EPA 2016). Because some listed threatened species (i.e. WRPs and black cockatoo) are known to occur in the general area, the scope of the survey work was expanded to include targeted assessment of the site's significance to these particular species. The assessment has included a literature review ("desktop study"), daytime reconnaissance survey and nocturnal surveys for WRPs.

The remnant native vegetation onsite is mainly comprised of various densities of *Banksia*, and *Kunzea glabrescens* with some emergent jarrah and less commonly marri over a low heath or in more degraded areas, introduced grasses/weeds. The southern one third of the subject site appears to have been partly cleared in the relatively recent past (~20 years ago) and is now in a state of regrowth with midstorey and groundcover species being generally sparse. A vehicle track/firebreak defines the eastern and northern boundary of the subject site.

Overall fauna values of the subject site can be expected to be reasonably good given that most of the vegetation present remains in at least good condition despite various levels of disturbance in some areas. The vegetation is also directly continuous with bushland in the Wardandi Flora Reserve located to the west which is likely to support a wide range of fauna species that would typically not be able to persist in smaller, degraded and/or partly degraded remnants.

Opportunistic fauna observations are listed in Appendix B. A total of 20 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the subject site during the single day time survey. One introduced species was also confirmed as being present. Most of the fauna species recorded are common, widespread bird species.

The presence of the threatened western ringtail possum was confirmed during the daytime survey in the form of dreys and scats and during the night time surveys, with a number of individuals being recorded. Evidence of all three listed threatened black cockatoo species was observed (forest red-tailed black cockatoo, Carnaby's black cockatoo and Baudin's black cockatoo – foraging evidence (chewed marri/jarrah fruits and banksia cones)). No evidence of any migratory or DBCA priority fauna species using the area was found.

The distribution of observations made during the various site surveys suggests that there were at least five WRPs (and two common brushtail possums) utilising the subject site at the time of the assessment. It has also been estimated that about 1.3 ha of the vegetation within the subject site can be regarded as “core” habitat for WRPs i.e. habitat providing a combination of foraging, refuge and dispersal opportunities with balance of the area representing poor quality WRP habitat.

The subject site was found to contain seven potential “black cockatoo breeding habitat trees” (DBH  $\geq$ 50cm). One of these trees was assessed as possibly having large enough hollows for black cockatoos to use for nesting. This tree was at the time of the first day time survey being investigated by several little corellas and a common brushtail possum was observed in one of the larger hollows during the second nocturnal survey. No actual evidence of any hollows being used by black cockatoos for nesting (currently or previously) was seen.

Sections of the subject site represent black cockatoo foraging habitat given the presence of *banksia* and to a lesser extent jarrah and marri, though the exact extent is difficult to quantify given the tree species in question vary in density from area to area. No existing roosting trees (trees used at night by black cockatoos to rest) were positively identified during the survey.

The assessment indicates that the primary consideration required during ongoing development planning will be related to the presence of habitat used or potentially used by some threatened fauna species in particular western ringtail possums and to a lesser degree the three south west black cockatoo species.

The results of this assessment should be provided to the relevant regulatory authorities for their consideration during the ongoing clearing permit assessment process.

A series of other recommendations aimed at mitigating and minimising potential impacts on fauna and fauna habitat in general are provided in Section 8. Subject to the clearing permit being approved, these should be considered for incorporation into a Fauna Management Plan for implementation during site development where determined to be reasonable and practicable.

## 1. INTRODUCTION

This report details the results of a fauna assessment of the Shire of Harvey's (the Shire) proposed extension of Kingston Drive from Paris Road to Grand Boulevard (the subject site). The subject site is situated about 12 kilometres north east of the Bunbury in south west Western Australia and is centred at approximately 33.276976° and 115.744628° (Figure 1).

It is understood that the Shire has applied for a clearing permit (CPS 7900/1) so as to allow for clearing of the vegetation prior to the road's construction. The permit area covers about 2.08 ha and is mostly covered by native remnant (Figure 2).

It is anticipated that the information presented here will be used by regulatory authorities to assess the potential impact of the proposal on fauna and fauna habitats at the site during the project evaluation and clearing permit approval process.

## 2. SCOPE OF WORKS

The scope of works is to conduct a series of fauna assessments in accordance with EPA guidelines (EPA 2016). Because the general area is known to be utilised by black cockatoos and western ringtail possums the scope of the survey work has included an initial assessment of the sites significance to these species as well. The fauna assessment will therefore include:

1. Level 1 Fauna Assessment;
2. Level 2 Fauna Surveys:
  - a. Targeted searches for black cockatoo habitat/site use (habitat trees, existing and potential nest hollows, foraging and roosting habitat);
  - b. Targeted searches for western ringtail possum habitat/site use (foraging, refuge and dispersal habitat and individuals); and
3. Report summarising results with management/planning recommendations.

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

### **3. METHODS**

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

##### **3.1.1 Database Searches**

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

- DBCA's NatureMap Database Search (combined data from DBCA, ALA, WAM, BA and consultant's reports) (DBCA 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.

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

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

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

- 360 Environmental Pty Ltd (2008). Southern Seawater Desalination Project 2007, Terrestrial Flora and Fauna Survey Report. Unpublished report for the Water Corporation.
- ATA Environmental (2005). Lot 1001 Mardo Avenue, Australind, Environmental Assessment. Unpublished report for Marist Brothers.
- ATA Environment (2005). Environmental Assessment, South Binningup V2, June 2005. Unpublished report.
- Bamford Consulting Ecologists (2008). Fauna Assessment of the Proposed South Binningup Development. Unpublished report for RPS Consulting/Mirvac.

- Dell, J. and Hyder, B. (2009). Summary of the Fauna Values of the area between Dawesville and Binningup, Southern Swan Coastal Plain. Report prepared for Environmental Protection Authority, Perth.
- GHD (2015). Waterloo Urban and Industrial Expansion. Flora and Fauna Survey. Unpublished report for Shire of Dardanup.
- Harewood, G. (2007). Fauna Assessment Lot 28 Clifton Close, Australind. Unpublished report for Cardno BSD Pty Ltd.
- Harewood, G. (2010). Fauna Survey (Level 2). Kemerton Industrial Core. Unpublished report for Cardno (WA) Pty Ltd.
- Harewood, G. (2012). Fauna Assessment of Lot 9004 (part) Treendale Stage 4. Unpublished report for Treendale.
- Harewood, G. (2013). Fauna Assessment of Lot 150 Leisure Drive Australind. Unpublished report for Strategen.
- Harewood, G. (2014). Western Ringtail Possum Survey of the Proposed Bridge Crossing (Bridge 5370), Collie River – Millbridge/Treendale. Unpublished report for MRWA.
- Harewood, G. (2015). Fauna Survey (Level 2) Dampier to Bunbury Natural Gas Pipeline Corridor. Bristol Road to Clifton Road. Unpublished Report for Aurora Environmental.
- Harewood, G. (2016a). Fauna Assessment - Lot 561 Paris Road Australind. Unpublished report for RPS.
- Harewood, G. (2016b). Lots 7, 9, 10, 50, 100 (east) & 100 (west) Clifton Road, Brunswick. Unpublished report for JAK Civil.
- Western Wildlife (2009). Lot 76 Binningup Road, Binningup. Fauna Survey 2008. Unpublished report for Niche 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.

### **3.1.3 Existing Publications**

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

- Anstis, M. (2013). Tadpoles and Frogs of Australia. New Holland Publishers, Sydney.
- Barrett, G., Silcocks, A., Barry, S., Cunningham, R. and Poulter, R. (2003). The New Atlas of Australian Birds. Royal Australasian Ornithologists Union, Victoria.
- Bush, B., Maryan, B., Browne-Cooper, R. & Robinson, D. (2007). Reptiles and Frogs in the Bush: Southwestern Australia. UWA Press, Nedlands.
- Bush, B., Maryan, B., Browne-Cooper, R. & Robinson, D. (2010). Field Guide to Reptiles and Frogs of the Perth Region. UWA Press, Nedlands.
- Churchill, S. (2008). Australian Bats. Second Edition, Allen & Unwin.
- Cogger, H.G. (2014). Reptiles and Amphibians of Australia. 7th Edition. CSIRO Publishing.
- Johnstone, R.E. and Storr, G.M. (1998). Handbook of Western Australian Birds: Volume 1 – Non-passerines (Emu to Dollarbird). Western Australian Museum, Perth Western Australia.
- Johnstone, R.E. and Storr, G.M. (2004). Handbook of Western Australian Birds: Volume 2 – Passerines (Blue-winged Pitta to Goldfinch). Western Australian Museum, Perth Western Australia.
- Menkhorst, P. and Knight, F. (2011). A Field Guide to the Mammals of Australia. Oxford University Press, Melbourne.
- Morgan, D.L., Beatty, S.J., Klunzinger, M.W, Allen, M.G. and Burnham, Q.E (2011). Field Guide to the Freshwater Fishes, Crayfishes and Mussels of South Western Australia. Published by SERCUL.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1983). Lizards of Western Australia II: Dragons and Monitors. WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1990). Lizards of Western Australia III: Geckos and Pygopods. WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1999). Lizards of Western Australia I: Skinks. Revised Edition, WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (2002). Snakes of Western Australia. Revised Edition, WA Museum, Perth.
- Tyler M.J. & Doughty P. (2009). Field Guide to Frogs of Western Australia, Fourth Edition, WA Museum, Perth.

- Van Dyck, S., Gynther, I. & Baker, A. Eds (2013). Field Companion to The Mammals of Australia. Queensland Museum.
- Wilson, S. and Swan, G. (2017). A Complete Guide to Reptiles of Australia. Reed, New Holland, Sydney.
- Woinarski, J., Burbidge, A. & Harrison, P. (2014). The Action Plan for Australian Mammals 2012. CSIRO Publishing.

### 3.1.4 Fauna of Conservation Significance

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

- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. Administered by the Australian Government Department of the Environment and Energy (DotEE);
- *Wildlife Conservation Act 1950 (WC Act)*. Administered by the Western Australian Department of Biodiversity, Conservation and Attractions (DBCA) (Govt. of WA 2018);
- Red List produced by the Species Survival Commission (SSC) of the World Conservation Union (also known as the IUCN Red List - the acronym derived from its former name of the International Union for Conservation of Nature and Natural Resources). The Red List has no legislative power in Australia but is used as a framework for State and Commonwealth categories and criteria; and the
- DBCA Priority Fauna list. A non-statutory list maintained by the DBCA for management purposes (DBCA 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 generally also classified as migratory under Schedule 5 of the *WC Act*.)

Some migratory bird species listed in the annexes to these bilateral agreements are also protected in Australia as matters of national environmental significance (MNES) under the *EPBC Act*. Species classified as “Marine” are not considered to be MNES and are not considered in this report

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

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

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

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

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

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

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

For this 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 as it can be difficult to identify significant invertebrate species due to uncertainties in determining the range-restrictions of many species due to lack of surveys, lack of taxonomic resolutions within target taxa and problems in identifying certain life stages.

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

### 3.1.6 Likelihood of Occurrence – Vertebrate 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).
  - o **Locally Extinct:** Populations no longer occur within a small part of the species natural range, in this case within 10 or 20km of the subject site. Populations do however persist outside of this area.
  - o **Regionally Extinct:** Populations no longer occur in a large part of the species natural range, in this case within the central southern swan coastal plain. Populations do however persist outside of this area.
- **Unlikely to Occur:** The subject site is outside of the currently documented distribution for the species in question, or no suitable habitat (type, quality and extent) was identified as being present during the field assessment. Individuals of some species may occur occasionally as vagrants/transients especially if suitable habitat is located nearby but the subject site itself would not support a population or part population of the species.
- **Possibly Occurs:** The subject site is within the known distribution of the species in question and habitat of at least marginal quality was identified as being present during the field assessment, supported in some cases by recent records being documented in literature from within or near the subject site. In some cases, while a species may be classified as possibly being present at times, habitat may be marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.
- **Known to Occur:** The species in question was positively identified as being present (for sedentary species) or as using the subject site as habitat for some other purpose (for non-sedentary/mobile species) during the field survey. This information may have been obtained by direct observation of individuals or by way of secondary evidence (e.g. foraging debris, tracks and scats). In some cases, while a species may be classified as known to occur, habitat may be marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.

### **3.1.7 Taxonomy and Nomenclature**

Taxonomy and nomenclature for fauna species used in this report is generally taken from the DPaW'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) and Tyler & Doherty (2009). Not all common names are generally accepted.

## **3.2 SITE SURVEYS**

Daytime field survey work at the site was carried out by Greg Harewood (Zoologist) on the 24 and 25 August 2018. The nocturnal WRP surveys were carried out on the 24 & 27 August 2018.

### **3.2.1 Fauna Habitat Assessment**

The vegetation communities, soils and landforms identified during the site reconnaissance survey have been used as the basis for a classification of areas into broad fauna habitat types.

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.

### **3.2.2 Opportunistic Fauna Observations**

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

### 3.2.3 Western Ringtail Possum Assessment

To determine if western ringtail possums were utilising the study area the following was carried out:

- Daytime survey of the site along closed spaced traverses searching for dreys, obvious tree hollows (and other potential daytime refuge habitat), scats and individual WRPs. The day time survey was carried out using a GPS equipped PDA for guidance and as a data recorder;
- Two night time surveys were undertaken to provide information on the approximate distribution and abundance of WRPs. The nocturnal counts involved the systematic searching of potential WRP habitats within the subject along close spaced transects, on foot using a head torch. The nocturnal counts were carried out using a GPS equipped PDA for guidance and as a data recorder; and
- An estimation of the amount and quality of WRP habitat present within the subject site based on field observations and available air photography.

### 3.2.4 Black Cockatoo Habitat Assessment

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

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

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

- Breeding Habitat;
- Foraging Habitat; and

- Night Roosting Habitat.

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

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

The black cockatoo breeding habitat assessment involved the identification of all suitable breeding trees species (native, endemic species only) 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”.

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.

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

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

*Generally any tree which is alive or dead that contains one or more visible hollows (cavities within the trunk or branches) or possible hollows considered potentially suitable for occupation by black cockatoos for the purpose of nesting/breeding. Hollows or possible 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 “potential nest hollows”.*

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). In some cases, a drone was also used to examine hollows more closely and to obtain photographs.

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

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

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

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

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

Direct and indirect evidence of black cockatoos roosting within trees was with the subject site was noted if observed (e.g. branch clippings, droppings or moulted feathers). Two dusk surveys were also carried out immediately prior to the nocturnal WRP surveys

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

## **4. SURVEY CONSTRAINTS**

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

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

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

Lack of observational data on some species should therefore not necessarily be taken as an indication that a species is absent from the subject site.

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

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

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

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

## **5. RESULTS**

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

A list of fauna species considered most likely to occur in the subject site has been compiled from information obtained during the literature review and is presented in Appendix B. This listing was refined after information gathered during the site reconnaissance survey was assessed.

The results of some previous fauna surveys carried out in the general area are summarised in this species listing as are the DBCA NatureMap database search results. Species considered unlikely to occur with the subject site but previously recorded in other surveys and/or which appear in the DBCA database search are not listed. The raw database search results from NatureMap (DBCA 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. Compiling an accurate fauna list has limitations (see Section 4 above) and therefore, as previously indicated the listing is likely to be an overestimation of the fauna species actually present within the subject site at any one time.

## 5.2 SITE SURVEYS

### 5.2.1 Fauna Habitat Assessment

The subject site is situated on the western margin of the Swan Coastal Plain within a subdued section of the Bassendean Dune System characterised by thin leached grey sands overlaying sandy clays of the Guildford Formation. The general area has largely been cleared of vegetation in the past, primarily for livestock grazing and more recently for residential and light industrial developments.

The remnant native vegetation onsite is mainly comprised of various densities of *Banksia*, and *Kunzea glabrescens* with some emergent jarrah and less commonly marri over a low heath or in more degraded areas, introduced grasses/weeds. The southern one third of the subject site appears to have been partly cleared in the relatively recent past (~20 years ago) and is now in a state of regrowth with midstorey and groundcover species being generally sparse. This area contains a number of large non-endemic *Acacia* species. A vehicle track/firebreak defines the eastern and northern boundary of the subject site.

Descriptions and examples images of the main fauna habitats/dominant vegetation present within the subject site are provided in Table 1.

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

| Unit | Fauna Habitat Description                                                                                                                                                                                                                                                                                                                                 | Example Image                                                                        |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1    | <p><u>Kunzea Tall Shrubland with Emergent Jarrah</u></p> <p>A tall shrubland to tall open shrubland of <i>Kunzea glabrescens</i> with widely scattered emergent jarrah (some dead), <i>Nuytsia floribunda</i>, <i>Banksia ilicifolia</i> and <i>Banksia attenuata</i> over a Low Open Shrubland or mixed Herbs on sand.</p> <p>Area = ~ 0.5 ha (~24%)</p> |  |

| Unit | Fauna Habitat Description                                                                                                                                                                                                                                                                                                                                                     | Example Image                                                                       |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 2    | <p><u><i>Banksia</i> Low Open Forest</u></p> <p>Low Open Forest of <i>Banksia ilicifolia</i> and <i>Banksia attenuata</i> with widely scattered emergent jarrah (some dead) with occasional <i>Nuytsia floribunda</i>, marri and peppermint over a Tall Shrubland of <i>Kunzea glabrescens</i> over a Low Shrubland or mixed Herbs on sand.</p> <p>Area = ~ 0.8 ha (~38%)</p> |   |
| 3    | <p><u>Low Open Woodland – partly cleared with regrowth</u></p> <p>Low Open Woodland of scattered jarrah, marri and occasional <i>banksia</i> over shrubland including non-endemic acacias over Shrubland/Herbs on sand – mostly regrowth from an historical clearing event.</p> <p>Area = ~ 0.6 ha (~29%)</p>                                                                 |  |
| 4    | <p><u>Cleared (vehicle tracks)</u></p> <p>Bare sand</p> <p>Area = ~ 0.2 ha (~9%)</p>                                                                                                                                                                                                                                                                                          | No image                                                                            |

Overall fauna values of the subject site can be expected to be reasonably good given that most of the vegetation present remains in at least good condition despite various levels of disturbance in some areas. The vegetation is also directly continuous with bushland in the Wardandi Flora Reserve located to the west which is likely to support a wide range of fauna species that would typically not be able to persist in smaller, degraded and/or partly degraded remnants.

### 5.2.2 Opportunistic Fauna Observations

Opportunistic fauna observations are listed in Appendix B. A total of 20 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the subject site during the course of site visits. One introduced species were also confirmed as being present. Most of the fauna species recorded are common, widespread bird species.

The presence of the threatened western ringtail possum was confirmed during the daytime survey in the form of dreys and scats and during the night time surveys, with a number of individuals being recorded (see section 5.2.3). Evidence of all three listed threatened black cockatoo species was observed (forest red-tailed black cockatoo, Carnaby's black cockatoo and Baudin's black cockatoo – foraging evidence (chewed marri/jarrah fruits and banksia cones)) (see section 5.2.4.2). No evidence of any migratory or DBCA priority fauna species using the area was found.

### **5.2.3 Western Ringtail Possum Assessment**

The locations of various possum observations made during the site surveys are shown in Figure 3.

In total four WRP dreys were observed during the day survey (one of which was located just outside of the subject sites boundary). Five trees containing hollows/possible hollows with the potential to be suitable for possums to use for day time refuge were also recorded. Forks in trees, subtle cavities in tree trunks, fallen hollow logs, rabbit burrows and dense ground cover are also used by WRPs for daytime refuge and therefore observations of dreys and hollows only provide a guide to WRP habitat use/quality as other opportunities for daytime refuge may exist.

WRP scats were observed at four locations. In many areas dense leaf litter and grasses made searching for scats difficult and time consuming and therefore this method for determining WRP presence was not employed extensively.

Four WRPs and one common brushtail possum were observed during the first nocturnal survey. Four WRPs and two common brushtail possums were observed during the second nocturnal survey. The distribution of observations suggests that there were at least five WRPs and two common brushtail possums utilising the subject site at the time of the surveys.

Based on the observations made during the field survey it is estimated that about 1.3 ha of the vegetation within the subject site can be regarded as “core” habitat for WRPs i.e. habitat providing a combination of foraging, refuge and dispersal opportunities (Units 1 and 2). The balance of the area represents poor quality WRP habitat (~0.6 ha – Unit 3) or is totally cleared (~0.2 ha).

The Wardandi Flora Reserve which directly adjoins the subject site along its western boundary represents the closest and largest area of potential WRP habitat to the subject site. The reserve has an area of about 42 ha, much of which appears suitable for WRPs to utilise. A brief day time examination of part of this area in 2007 by the Author resulted in the detection of a number WRP dreys. Some of the vegetation along the nearby Collie and Brunswick Rivers is also likely to be utilised by WRPs with some previous surveys confirming their presence in some areas (Harewood 2012, Harewood 2014).

## 5.2.4 Black Cockatoo Habitat Assessment

### 5.2.4.1 Black Cockatoo Breeding Habitat

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

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

It should be noted that the likelihood of particular tree species developing hollows suitable for black cockatoos to use for breeding varies considerably. On the Swan Coastal Plain tuart is most commonly used by Carnaby's black cockatoos for breeding (Johnstone & Kirkby 2011). Available data also suggests that jarrah (*Eucalyptus marginata*) rarely produces suitable hollows. Kirkby (2009) reports that from a database of 109 confirmed black cockatoo nest trees throughout and are of jarrah forest only six were located in jarrah trees.

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

The assessment identified seven trees within the subject site with a DBH of >50cm. Five of these trees were observed to contain hollows or possible hollows of some type with one being assessed at the time to possibly have large enough hollows for black cockatoos to use for nesting. This tree was at the time of the first day time survey being investigated by several little corellas and a common brushtail possum was observed in one of the larger hollows during the second nocturnal survey. No actual evidence of any hollows being used by black cockatoos for nesting (currently or previously) was seen.

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

| Total Number of Habitat Trees | Number of Trees with <u>No Hollows</u> Observed | Number of Trees with Hollows Considered <u>Unsuitable</u> for Nesting Black Cockatoos | Number of Trees with Hollows Considered <u>Possibly</u> Suitable for Nesting Black Cockatoos | Tree Species |       |              |
|-------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|--------------|-------|--------------|
|                               |                                                 |                                                                                       |                                                                                              | Jarrah       | Marri | Dead Unknown |
| 7                             | 2                                               | 4                                                                                     | 1                                                                                            | 5            | 1     | 1            |

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

A review of publicly available data showed no previous black cockatoo breeding records in or near the subject site (DoP 2011). The closest breeding records shown in the DoP document are located 24 km south east of the subject site in Dalyellup.

Based on available mapping there is about 5,500 ha of remnant native vegetation within 10 kilometres of the subject site. Some of this vegetation is also likely to contain “potential” breeding habitat as defined by DotEE.

#### **5.2.4.2 Black Cockatoo Foraging Habitat**

Following is a list of the flora species recorded within the study area that are known to be used as a direct food source (i.e. fruits or flowers) by one or more species of black cockatoo:

- *Corymbia calophylla*;
- *Eucalyptus marginata*;
- *Banksia attenuata*;
- *Banksia ilicifolia*; and
- *Xanthorrhoea gracilis*.

The main foraging resource within the study area is represented by *Banksia attenuata*, marri and jarrah, though the number of live marri and jarrah trees present is relatively small and therefore they do not contribute to the total potential food resource to any significant degree. *Banksia ilicifolia* and grass trees (*Xanthorrhoea gracilis*) while also present in various densities, would only make up a very small proportion of any one birds diet as they are only fed upon rarely and to a limited degree.

Foraging evidence left by black cockatoos in the form of chewed marri and jarrah fruits and *Banksia attenuata* cones (some old and some relatively fresh) were found at a few locations across the subject site. This evidence was attributed to the forest red-tailed black-cockatoo, Carnaby’s black-cockatoo or Baudin’s black-cockatoo depending on the tree species and/or the nature of the marks left on the fruit debris in each instance, examples of which is provided in Table 3.

It is difficult to provide an accurate estimate of the extent of quality black cockatoo foraging habitat within the subject site given that species composition and density varies across the site. Excluding cleared areas, the entire site can be regarded as containing foraging habitat given the presence of some favoured plant species in most locations though the density and distribution of species varies from area to area and therefore the exact extent and quality is difficult to quantify. In some areas the favoured foraging species are absent or represented by only a small number of specimens (e.g. areas dominated by *Kunzea*).

**Table 3: Foraging evidence examples**

| Foraging Evidence Description                                                               | Example Image                                                                        |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <p>Marri Fruits – foraging activity attributed to the forest red-tailed black-cockatoo.</p> |    |
| <p>Marri fruits – foraging activity attributed to the Carnaby's black cockatoo.</p>         |   |
| <p>Marri fruits – foraging activity attributed to the Baudin's black cockatoo.</p>          |  |

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

It is difficult to provide an accurate estimate of the extent of quality black cockatoo foraging habitat within the subject site given that species composition and density varies across the site. Excluding cleared areas, the entire site can be regarded as containing foraging habitat given the presence of some favoured plant species in most locations though the density and distribution of species varies from area to area and therefore the exact extent and quality is difficult to quantify. In some areas the favoured foraging species are absent or represented by only a small number of specimens (e.g. areas dominated by *Kunzea*).

Based on available mapping there is about 5,500 ha of remnant native vegetation within 10 kilometres of the subject site. Much of this is likely to also represent black cockatoo foraging habitat of some type.

The Wardandi Flora Reserve which directly adjoins the subject site along its western boundary represents the closest and largest area of potential black cockatoo foraging habitat to the subject site. The reserve has an area of about 42 ha, much of which appears to contain *Banksia*.

### 5.2.4.3 Black Cockatoo Roosting Habitat

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

A review of the 2017 Great Cocky Count database shows no documented roost sites within the subject site, the closest active roost (2017) being about 2.5 km west. This site was in use by seven red-tailed black cockatoos and 11 white-tailed black cockatoos during the 2017 Great Cocky Count. Another 10 documented roost sites (but not necessarily in current use) occur within 10 km of the subject site.

## 5.3 FAUNA INVENTORY – SUMMARY

### 5.3.1 Vertebrate Fauna

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

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

| Group                 | Total number of <u>Potential</u> species | Potential number of <u>Specially Protected</u> species | Potential number of <u>Migratory</u> species | Potential number of <u>Priority</u> species | Number of species <u>recorded</u> during field survey |
|-----------------------|------------------------------------------|--------------------------------------------------------|----------------------------------------------|---------------------------------------------|-------------------------------------------------------|
| Amphibians            | 2                                        | 0                                                      | 0                                            | 0                                           | 0                                                     |
| Reptiles              | 22                                       | 0                                                      | 0                                            | 1                                           | 0                                                     |
| Birds                 | 77 <sup>1</sup>                          | 4                                                      | 0                                            | 0                                           | 18                                                    |
| Non-Volant Mammals    | 12 <sup>5</sup>                          | 2                                                      | 0                                            | 1                                           | 3                                                     |
| Volant Mammals (Bats) | 9                                        | 0                                                      | 0                                            | 1                                           | 0                                                     |
| <b>Total</b>          | <b>122<sup>6</sup></b>                   | <b>6</b>                                               | <b>2</b>                                     | <b>2</b>                                    | <b>21<sup>1</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.

### 5.3.2 Vertebrate Fauna of Conservation Significance

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

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

- Carnaby's Black-Cockatoo *Calyptorhynchus latirostris* – S2 (*WC Act*), Endangered (*EPBC Act*)  
Foraging evidence attributed to this species was found during the survey period (e.g. chewed marri, banksia and jarrah fruits) and parts of the remnant vegetation within the subject site represent foraging habitat. Larger trees ( $\geq 50\text{cm}$  DBH) can be considered potential breeding habitat. No roosting sites identified.
- Forest Red-tailed Black-Cockatoo *Calyptorhynchus banksii naso* – S3 (*WC Act*), Vulnerable (*EPBC Act*)  
Foraging evidence attributed to this species was found during the survey period (e.g. chewed marri and jarrah fruits) and parts of the remnant vegetation within the subject site represent foraging habitat. Larger trees ( $\geq 50\text{cm}$  DBH) can be considered potential breeding habitat. No roosting sites identified.
- Baudin's Black-Cockatoo *Calyptorhynchus baudinii* – S3 (*WC Act*), Vulnerable (*EPBC Act*)  
Foraging evidence attributed to this species was found during the survey period (e.g. chewed marri fruits) and parts of the remnant vegetation within the subject site represent potential foraging habitat for this species. Larger trees ( $\geq 50\text{cm}$  DBH) can be considered potential breeding habitat. No roosting sites identified.
- Western Ringtail Possum *Pseudocheirus occidentalis* – S1 (*WC Act*), Critically Endangered (*EPBC Act*)

The results of the site surveys suggest that at least five WRPs were using the subject site at the time of the assessment. At least 1.3 ha of vegetation with the area represents potential core habitat (i.e. habitat providing a combination of foraging, refuge and dispersal opportunities).

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

These species are:

- Coastal Plains Skink *Ctenotus ora* – P3 (DPaW Priority Species)  
Status of this species within the subject site is difficult to determine without a detailed survey, however, given the location of the subject site in the centre of its documented range and the presence of habitat that appears suitable its presence cannot be totally discounted.
- Peregrine Falcon *Falco peregrinus* – S7 (WC Act)  
This species potentially utilises some sections of the subject site as part of a much larger home range. No evidence of nesting seen and the probability of this species breeding within the subject site can be considered to be very low.
- South-western Brush-tailed Phascogale *Phascogale tapoatafa wambenger* – S6 (WC Act)  
Status within the general area difficult to determine without a detailed survey. Potentially present given the presence of what appears to be suitable habitat including tree hollows.
- Quenda *Isoodon fusciventer* – P4 (DBCA Priority Species)  
Habitat appears suitable and individuals of this species may inhabit some sections of the subject site where ground cover is densest.
- Western False Pipistrelle *Falsistrellus mackenziei* – P4 (DBCA Priority Species)  
The status of this species onsite is uncertain however given the present of hollow trees (potential daytime refuge sites) and some recent records from along the Brunswick River and at Kemerton (Harewood 2015) its presence cannot be totally discounted.

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

As previously indicated a number of other species of conservation significance, while possibly present in the wider area (e.g. Leschenault Estuary, Kemerton Buffer Zone, 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.

Twenty eight bird species that potentially frequent or occur in the subject site are noted as Bush Forever Decreaser Species in the Perth Metropolitan Region (five 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 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).

### **5.3.3 Invertebrate Fauna of Conservation Significance**

One conservation significant invertebrate species appeared in the DBCA database search (DBCA 2018b), this being Carter's freshwater mussel (*Westralunio carteri*). This species would not occur due to a complete lack of suitable habitat (freshwater stream/river).

## **6. FAUNA VALUES**

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

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

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

The subject site directly adjoins the Wardandi Flora Reserve and vegetation is therefore likely to be of a similar condition and type as represented in much of this reserve area. The survey also identified that the subject site is providing habitat to at least four species of conservation significance though its overall extent is relatively small. The value of this habitat is however very likely to decline given the ongoing impacts of dieback on dominant flora species.

The subject sites relatively small size and the presence of more substantial areas of better condition, managed land in the vicinity (e.g. Wardandi Flora Reserve, Kemerton and Leschenault CP) means the subject site on its own cannot be considered of significant regional value to fauna though it does currently contribute to the value of the adjoining Wardandi Flora Reserve to some degree and this will need to be taken into consideration.

## 6.2 ECOLOGICAL LINKAGE/WILDLIFE CORRIDOR VALUE

Linkage with adjacent bushland areas has been identified as a natural attribute of high priority in the assessment of a sites regional significance (EPA 2002a, Molloy *et al.* 2009). Two types of linked (or potentially linked) sequences of ecological communities were identified in the EPA's Strategy, vegetated sequences and river corridors. The vegetated sequences are further divided into two groups – those that link North-South predominantly along landforms and vegetation complexes; and those that link East-West across landform and vegetation complexes (EPA 2003a).

The Greater Bunbury Region (GBR) ecological linkages plan (Appendix 4, EPA 2003b) shows the study area as being situated within a broadly defined section of the south/north orientated McLarty/Kemerton/Twin Rivers/Preston River/Gwindinup ecological linkage and which coalesces with the Collie River ecological linkage just south of the study area.

Detailed analyses of potential ecological linkages more recently completed for the south west (Molloy *et al.* 2009) also shows the subject site as being within close proximity/part of these recognised ecological linkages.

The contribution the vegetation makes to the value of these identified ecological linkages is difficult to quantify but is probably limited to a supportive role given its location in relation to vegetation within the main linkage axis lines which, in this case, is primarily that directly bordering the nearby Brunswick and Collie Rivers along with associated wetlands. The clearing of vegetation from the subject site is unlikely to significantly impact on the existing value of the area has as a linkage/corridor.

## 7. POTENTIAL IMPACTS OF DEVELOPMENT

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

- Loss of vegetation/fauna habitat that may be used for foraging, breeding, roosting, or dispersal (includes loss of hollow bearing trees);
- Fragmentation of vegetation/fauna habitat which may restrict the movement of some fauna species;
- Modifications to surface hydrology, siltation of creek lines;
- Changes to fire regimes;
- Pollution (e.g. oil spills);
- Noise/Light/Dust;
- Spread of plant pathogens (e.g. dieback) and weeds;

- Potential increase in the number of predatory introduced species (e.g. cats);
- Death or injury of fauna during clearing and construction; and
- An increase in fauna road kills subsequent to development.

Based on the likely extent of proposed clearing and other factors such as its habitat quality/value and existing degree of fragmentation, the likely impacts on species of conservation significance previously recorded in the general area has been assessed, a summary of which is provided in Table 4 below.

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

| Common Name                                 | Genus & Species                           | Conservation Status<br>(See Appendix A for codes) | Habitat Present   | Likelihood of Occurrence                   | Possible Impacts/ Significance of Possible Impacts                     |
|---------------------------------------------|-------------------------------------------|---------------------------------------------------|-------------------|--------------------------------------------|------------------------------------------------------------------------|
| Carter's Freshwater Mussel                  | <i>Westralunio carteri</i>                | VU, VU                                            | No                | Would Not Occur                            | No impact.                                                             |
| Black-stripe Minnow                         | <i>Galaxiella nigrostriata</i>            | EN                                                | No                | Would Not Occur                            | No impact.                                                             |
| Balston's Pygmy Perch                       | <i>Nannatherina balstoni</i>              | VU, VU                                            | No                | Would Not Occur                            | No impact.                                                             |
| Pouched Lamprey                             | <i>Geotria australis</i>                  | P1                                                | No                | Would Not Occur                            | No impact.                                                             |
| Perth Lined Lerista                         | <i>Lerista lineata</i>                    | P3                                                | No/Marginal       | Unlikely to Occur                          | No impact.                                                             |
| The Bunbury Skink                           | <i>Hemiergis 'koontoolasi'</i>            | P1                                                | No                | Would Not Occur - species locally extinct. | No Impact.                                                             |
| Coastal Plains Skink                        | <i>Ctenotus ora</i>                       | P3                                                | Yes/Marginal      | Possible                                   | Loss/modification of very small areas of habitat/Low.                  |
| Australasian Bittern                        | <i>Botaurus poiciloptilus</i>             | S2, EN                                            | No/Very Marginal. | Would Not Occur                            | No impact.                                                             |
| Black Bittern                               | <i>Ixobrychus flavicollis australis</i>   | P1                                                | No/Very Marginal. | Would Not Occur                            | No impact.                                                             |
| Little Bittern                              | <i>Ixobrychus minutus</i>                 | P4                                                | No/Very Marginal. | Would Not Occur                            | No impact.                                                             |
| Migratory Shorebirds/Wetland/Marine Species | Various                                   | Mig, Various                                      | No                | Would Not Occur                            | No impact.                                                             |
| Blue-billed Duck                            | <i>Oxyura australis</i>                   | P4                                                | No                | Would Not Occur                            | No impact.                                                             |
| Eastern Osprey                              | <i>Pandion haliaetus</i>                  | S5, Mig                                           | No                | Would Not Occur                            | No impact.                                                             |
| Peregrine Falcon                            | <i>Falco peregrinus</i>                   | S6                                                | Yes               | Possibly Occurs but only rarely.           | Loss/modification of very small areas of foraging habitat/ Negligible. |
| Barking Owl                                 | <i>Ninox connivens connivens</i>          | P2                                                | No                | Would Not Occur                            | No impact.                                                             |
| Masked Owl                                  | <i>Tyto novaehollandae novaehollandae</i> | P3                                                | No/Marginal       | Unlikely to Occur                          | No impact.                                                             |

| Common Name                           | Genus & Species                            | Conservation Status<br>(See Appendix A for codes) | Habitat Present | Likelihood of Occurrence                                | Possible Impacts/ Significance of Possible Impacts                                                    |
|---------------------------------------|--------------------------------------------|---------------------------------------------------|-----------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 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.                                                                                            |
| Western Whipbird                      | <i>Psophodes nigrogularis nigrogularis</i> | S2, EN                                            | No              | Would Not Occur                                         | No impact.                                                                                            |
| Carnaby's Black Cockatoo              | <i>Calyptorhynchus latirostris</i>         | S2, EN                                            | Yes             | Known to Occur                                          | Loss of a small area of habitat/Low.                                                                  |
| Baudin's Black Cockatoo               | <i>Calyptorhynchus baudinii</i>            | S3, VU                                            | Yes             | Known to Occur                                          | Loss of a small area of habitat/Low.                                                                  |
| Forest Red-tailed Black Cockatoo      | <i>Calyptorhynchus banksii naso</i>        | S3, VU                                            | Yes             | Known to Occur.                                         | Loss of small areas of habitat/Low.                                                                   |
| Chuditch                              | <i>Dasyurus geoffroii</i>                  | S3, VU                                            | No              | Would not Occur – Locally extinct.                      | No impact.                                                                                            |
| Numbat                                | <i>Myrmecobius fasciatus</i>               | S2, EN                                            | No              | Would not Occur – Locally extinct.                      | No impact.                                                                                            |
| South-western Brush-tailed Phascogale | <i>Phascogale tapoatafa wambenger</i>      | S6                                                | Yes             | Possibly Occurs                                         | Loss/modification of very small areas of habitat/Low. Death or injury of individuals during clearing. |
| Quenda                                | <i>Isoodon fusciventer</i>                 | P4                                                | Yes             | Possibly Occurs                                         | Loss/modification of very small areas of habitat/Low. Death or injury of individuals during clearing. |
| Western Ringtail Possum               | <i>Pseudocheirus occidentalis</i>          | S1, CR                                            | Yes             | Known to Occur                                          | Loss of a small area of habitat/Low -Moderate. Death or injury of individuals during clearing.        |
| Woylie                                | <i>Bettongia penicillate ogilbyi</i>       | CR, EN                                            | No              | Would not Occur – Locally extinct.                      | No impact.                                                                                            |
| Western Brush Wallaby                 | <i>Macropus irma</i>                       | P4                                                | No              | Would Not Occur                                         | No impact.                                                                                            |
| Quokka                                | <i>Setonix brachyurus</i>                  | VU, VU                                            | No              | Would not Occur                                         | No impact.                                                                                            |
| Western False Pipistrelle             | <i>Falsistrellus mackenziei</i>            | P4                                                | Yes             | Possibly Occurs                                         | Loss/modification of very small areas of habitat/Low.                                                 |
| Water Rat                             | <i>Hydromys chrysogaster</i>               | P4                                                | No              | Would not Occur                                         | No impact.                                                                                            |

With respect to fauna in general, no substantial 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 a limited area of possible habitat. This coupled with the fact that most species are common and widespread, suggest that no overall change in their conservation status will result, despite a very localised

reduction in habitat extent. It should also be noted that the extent of vegetation within the subject site is relatively small and in decline primarily due to the effect of dieback.

The assessment does however indicate that any considerations required during ongoing development planning are most likely to be related to the presence of habitat used or potentially used by some threatened fauna species. In particular this applies to the western ringtail possum, which is resident on site and to a lesser extent all three species of south west black cockatoos which appear to utilise vegetation onsite as a foraging resource, though the extent of likely habitat loss will be very low in both instances.

## 8. CONCLUSION AND RECOMMENDATIONS

The fauna assessment within the subject site was undertaken for the purposes of delineating and characterising the fauna habitats and faunal assemblages present and to identify potential impacts of the proposed development. Targeted searches for western ringtail possums and black cockatoo individuals and their habitat were also carried out.

The assessment indicates that the primary consideration required during ongoing development planning will be related to the presence of habitat used or potentially used by some threatened fauna species in particular western ringtail possums and to a lesser degree the three south west black cockatoo species.

The results of this assessment should be provided to the relevant regulatory authorities for their consideration during the ongoing clearing permit assessment process.

Subject to the clearing permit application being approved, it is also recommended that a fauna management plan (FMP) be formulated for implementation during the clearing of any native vegetation within the subject site. The primary aim of the FMP should be to reduce the impact on fauna and fauna habitat as much as reasonable and practicable.

The following recommendations are provided for guidance for the formulation of the fauna management plan. This listing is not exhaustive and management actions should be finalised after liaison with relevant regulatory authorities.

It is recommended that:

- A pre-clearing trapping and active searching program should be carried out by a suitable qualified zoologist in the week immediately prior to clearing commencing.
- During clearing operations, a suitably experienced “fauna spotter” should be employed to inspect logs, trees and hollows (where possible) before clearing to reduce likelihood of injury to fauna. The fauna spotter should be familiar with standard DBCA clearing protocols and these should be (where relevant) followed during any site clearing works.

- Trees/large shrubs observed to contain hollows or possum dreys should be felled in a manner that reduces the likelihood that fauna present will be injured. Hollows and dreys in fallen trees should be inspected for fauna prior to removal from the site. If feasible any fauna encountered should be relocated to suitable retained habitat nearby.
- At this stage it is recommended that any western ringtail possums (and other native fauna) encountered during clearing operations be moved to suitable habitat within the adjoining Wardandi Flora Reserve.
- During site works areas requiring clearing should be clearly marked and access to other areas restricted to prevent accidental clearing of areas to be retained.
- No dead, standing or fallen timber should be removed unnecessarily. Logs (hollow or not) and other debris resulting from land clearing should be used to enhance fauna habitat in the adjoining reserve.
- Native fauna injured during clearing or normal site operations should be taken to a designated veterinary clinic or a DBCA nominated wildlife carer.

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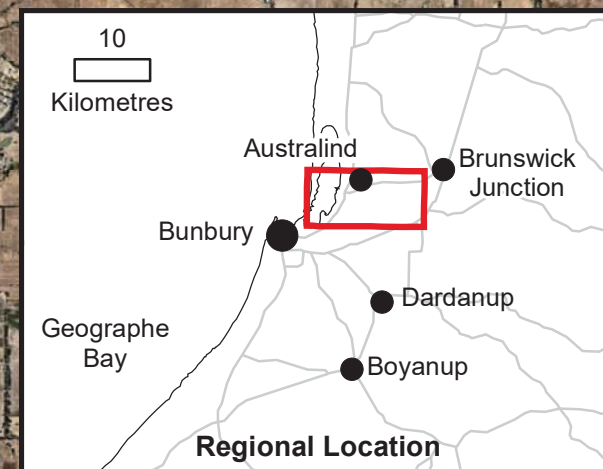
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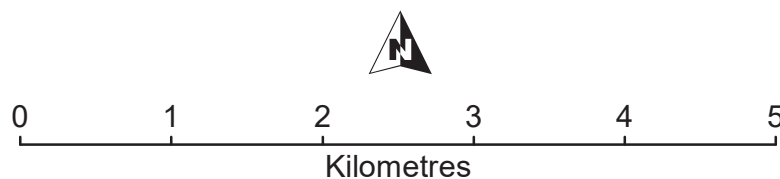
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# FIGURES



## Legend

Subject Site



Drawn: G Harewood

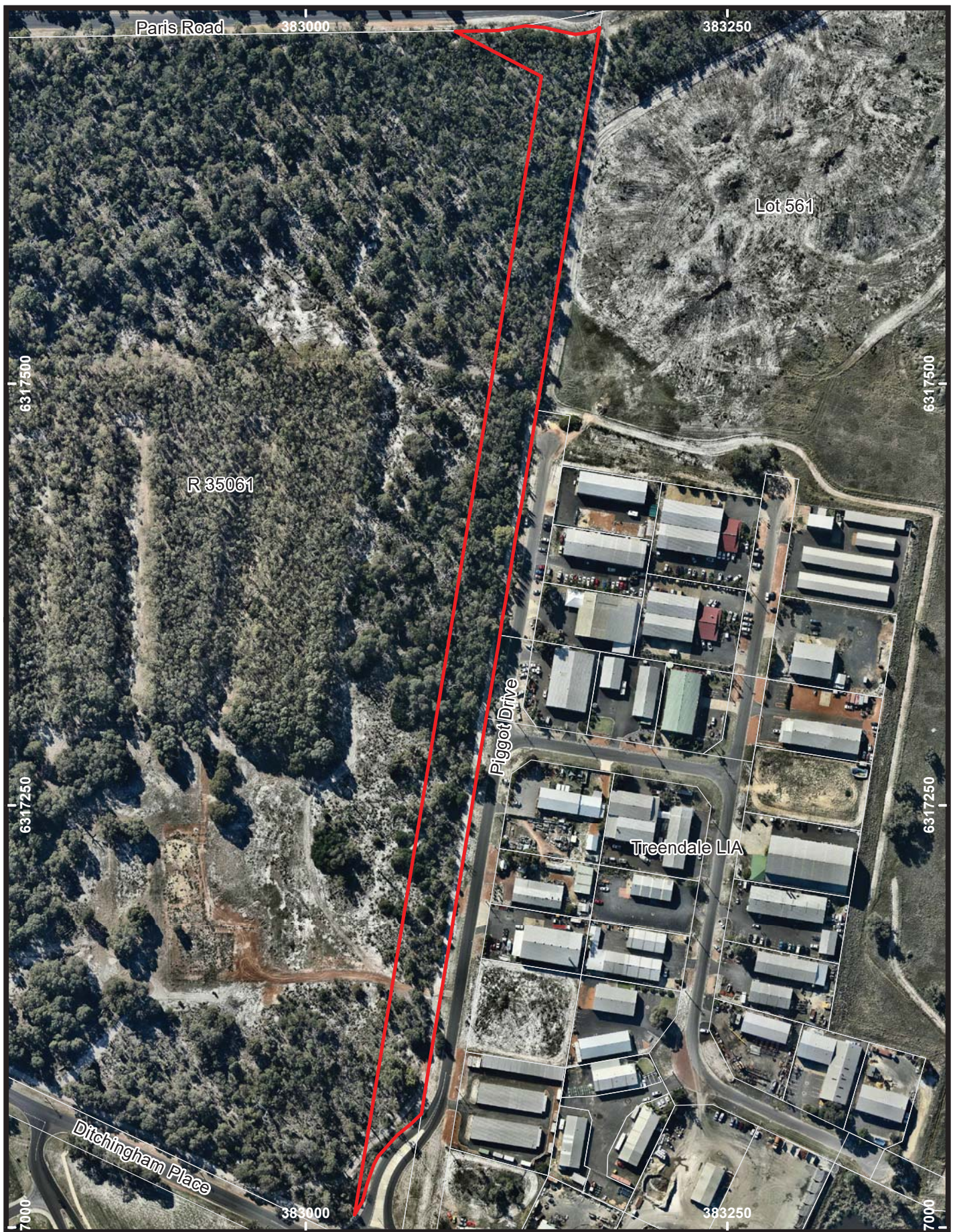
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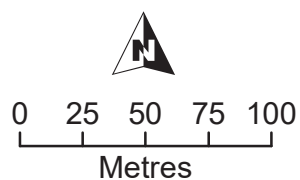
CPS 7900/1  
KINGSTON DRIVE EXTENSION  
SHIRE OF HARVEY  
**Subject Site  
&  
Surrounds**

Figure: 1



## Legend

Subject Site



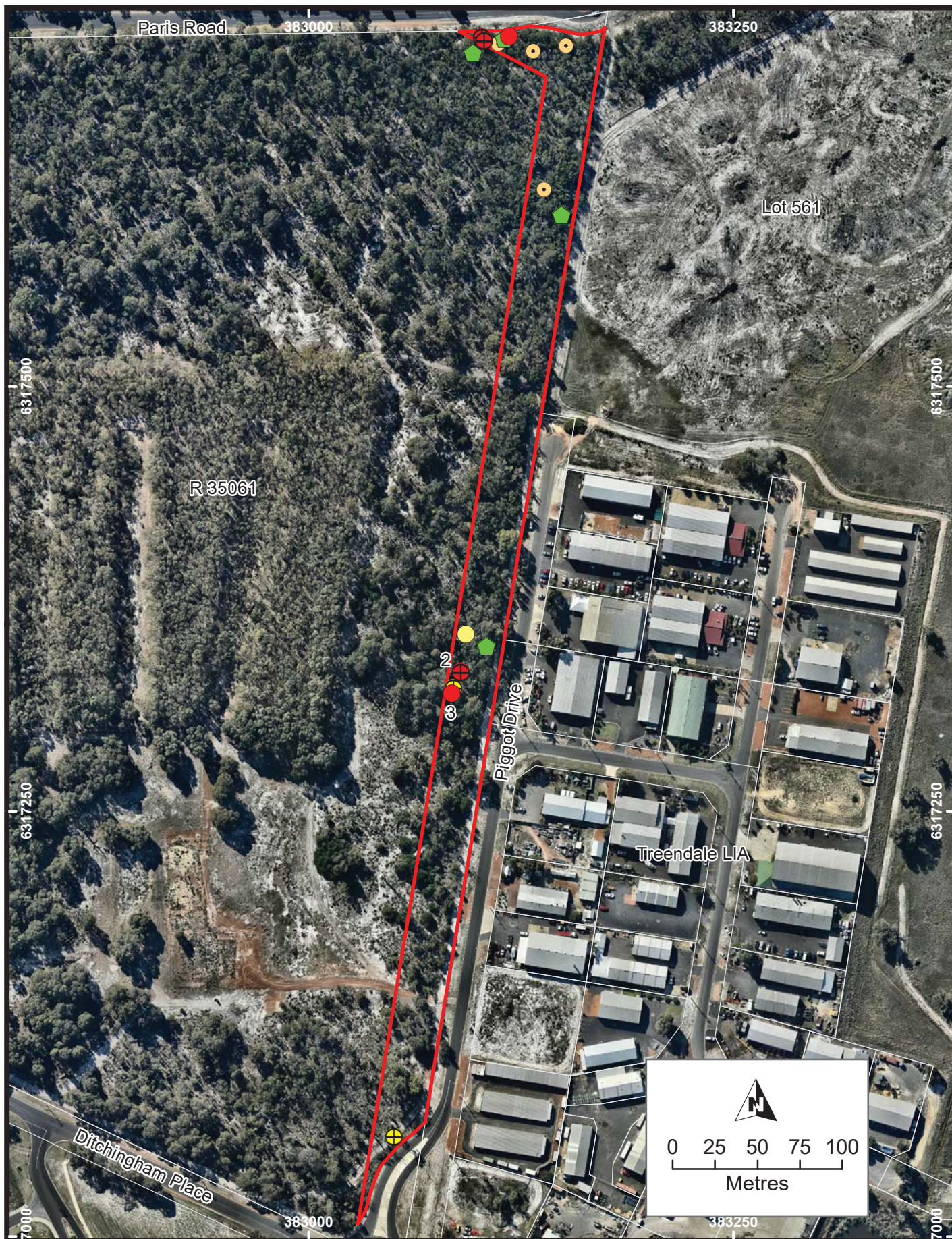


Fauna  
Assessment

Drawn: G. Harewood  
Date: Aug 2018  
Scale: 1:3,000  
Projection/Coordinate System: UTM/MGA Zone 50

CPS 7900/1  
KINGSTON DRIVE EXTENSION  
SHIRE OF HARVEY

**Air Photo**



## Legend

|                                                                          |                                                               |                                                               |
|--------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|
| <span style="border: 2px solid red; padding: 2px;"> </span> Subject Site | <b>Night 1</b>                                                | <b>Night 2</b>                                                |
| <b>Daytime Survey</b>                                                    | <span style="color: red;">●</span> Western Ringtail Possum    | <span style="color: red;">⊕</span> Western Ringtail Possum    |
| <span style="color: green;">▮</span> WRP Drey                            | <span style="color: yellow;">●</span> Common Brushtail Possum | <span style="color: yellow;">⊕</span> Common Brushtail Possum |
| <span style="color: orange;">○</span> WRP Scats                          |                                                               |                                                               |

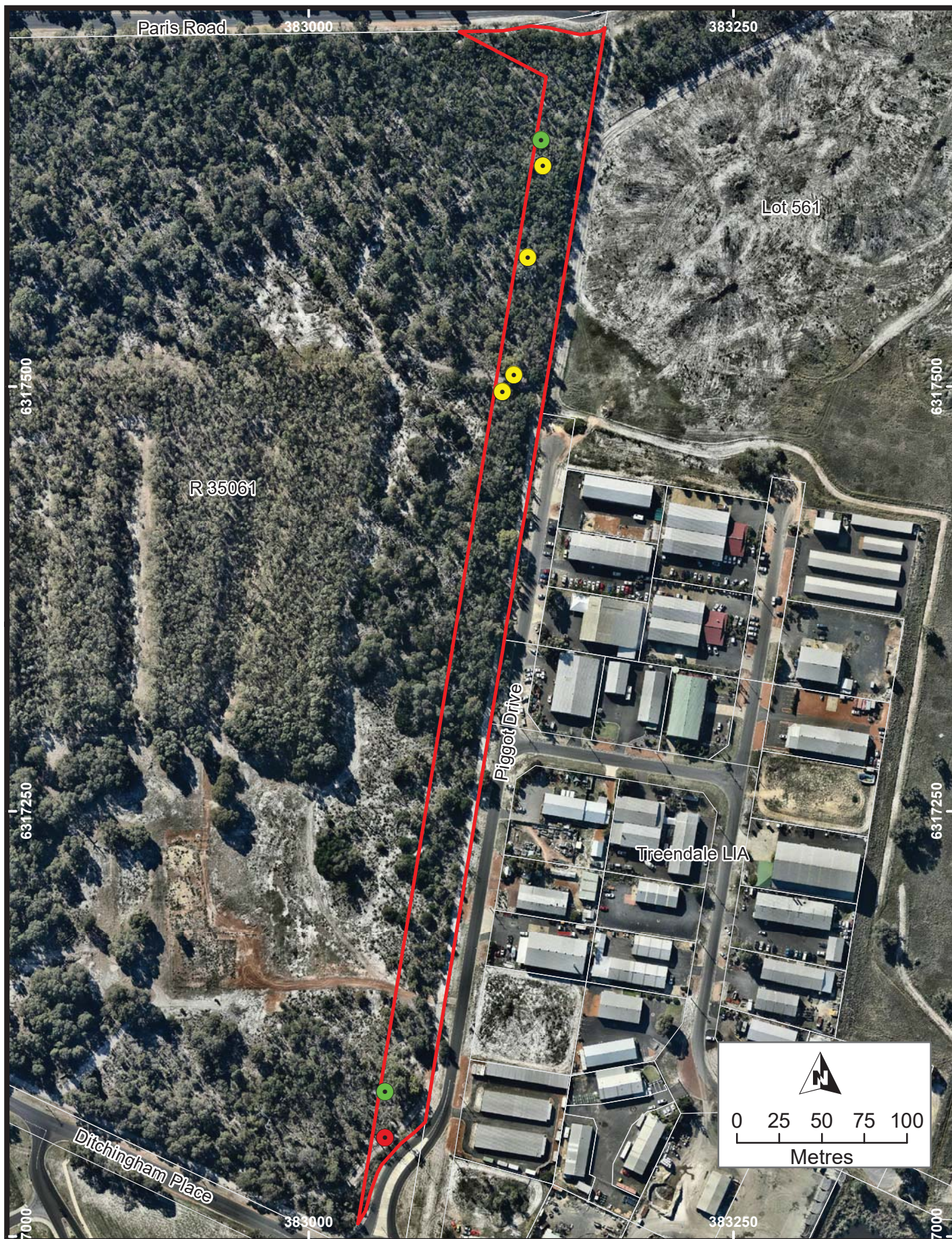


Fauna  
Assessment

Drawn: G. Harewood  
Date: Aug 2018  
Scale: 1:3,000  
Projection/Coordinate System: UTM/MGA Zone 50

CPS 7900/1  
KINGSTON DRIVE EXTENSION  
SHIRE OF HARVEY

**Possum  
Observations**



## Legend

Subject Site



Habitat Tree - One or more large hollows possibly suitable for black cockatoos



Habitat Tree - One or more possible small/medium hollows



Habitat Tree - No hollows seen



Fauna  
Assessment

Drawn: G. Harewood

Date: Aug 2018

Scale: 1:3,000

Projection/Coordinate System: UTM/MGA Zone 50

CPS 7900/1  
KINGSTON DRIVE EXTENSION  
SHIRE OF HARVEY

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

Figure: 4

# **APPENDIX A**

## **CONSERVATION CATEGORIES**

### ***EPBC Act (1999) Threatened Fauna Categories***

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

| <b>Category</b>        | <b>Code</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Extinct                | E           | There is no reasonable doubt that the last member of the species has died.                                                                                                                                                                                                                                                                                                                                                               |
| *Extinct in the wild   | EW          | A species<br>(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or<br>(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:<br>(a) is not critically endangered; and<br>(b) is facing a very high risk of extinction in the wild in the near future.                                                                                                                                                                                                                                                                                                      |
| *Vulnerable            | VU          | A species<br>(a) is not critically endangered or endangered; and<br>(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:<br>(i) native species; and<br>(ii) from time to time included in the appendices to the Bonn Convention; and<br>(b) all migratory species from time to time included in annexes established under JAMBA, CAMBA and ROKAMBA; and<br>(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<br><br>Critically Endangered species                                              | CR   | Threatened species considered to be facing an extremely high risk of extinction in the wild.                                                                                                                                                |
| Schedule 2<br><br>Endangered species                                                         | EN   | Threatened species considered to be facing a very high risk of extinction in the wild.                                                                                                                                                      |
| Schedule 3<br><br>Vulnerable species                                                         | VU   | Threatened species considered to be facing a high risk of extinction in the wild.                                                                                                                                                           |
| Schedule 4<br><br>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<br><br>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<br><br>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<br><br>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<br><br>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<br><br>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<br><br>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<br><br>Rare, Near Threatened and other species in need of monitoring. | P4   | <p>(a) Rare: Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.</p> <p>(b) Near Threatened: Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent.</p> <p>(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p> |

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

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

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

Categories are summarized below.

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

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

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

# **APPENDIX B**

## **FAUNA OBSERVED OR POTENTIALLY PRESENT**

# Observed and Potential Fauna Listing

## Kingston Drive Extension, Australind

Compiled by Greg Harewood - August 2018

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

Approximate centroid = 33.276290 and 115.744758°

A = Harewood, G. (2018). Fauna Assessment - Kingston Drive Extension (CPS 7900/1) Australind. Unpublished report for Shire of Harvey.

B = Harewood, G. (2016). Fauna Assessment Lot 561 Paris Road Australind. Unpublished Report for RPS Australia Asia Pacific

C = Harewood, G. (2015). Fauna Survey (Level 2) Dampier to Bunbury Natural Gas Pipeline Corridor. Bristol Road to Clifton Road. Unpublished report for Aurora Environmental.

D = GHD (2015). Waterloo Urban and Industrial Expansion. Flora and Fauna Survey. Unpublished report for Shire of Dardanup.

E = Harewood, G. (2010). Kemerton Industrial Core - Fauna Survey. Unpublished report for Landcorp.

F = 360 Environmental Pty Ltd (2008). Southern Seawater Desalination Project 2007, Terrestrial Flora and Fauna Survey Report. Unpublished report for the Water Corporation.

G = Bamford Consulting Ecologists (2008). Fauna Assessment of the Proposes South Binningup Development. Unpublished report for RPS Consulting/Mirvac.

H = Western Wildlife (2009). Lot 76 Binningup Rd, Binningup: Fauna Survey 2008. Unpublished report for Niche Consulting.

I = ATA Environmental (2005). Lot 1001 Mardo Avenue, Australind, Environmental Assessment. Unpublished report for Marist Brothers.

J = DBCA (2018). NatureMap Database search. "By Circle" Centre -115° 44' 41" E, 33° 16' 35" S. (20km Buffer). Accessed 30/08/2018.

| Class<br>Family<br>Species | Common<br>Name | Conservation<br>Status | A | B | C | D | E | F | G | H | I | J |
|----------------------------|----------------|------------------------|---|---|---|---|---|---|---|---|---|---|
|----------------------------|----------------|------------------------|---|---|---|---|---|---|---|---|---|---|

## Amphibia

### Myobatrachidae

Ground or Burrowing Frogs

|                               |                    |    |  |  |   |   |   |   |   |   |   |   |
|-------------------------------|--------------------|----|--|--|---|---|---|---|---|---|---|---|
| <i>Heleioporus eyrei</i>      | Moaning Frog       | LC |  |  | X | X | X | X | X | X | X | X |
| <i>Limnodynastes dorsalis</i> | Western Banjo Frog | LC |  |  | X | X | X | X | X | X | X | X |

## Reptilia

### Gekkonidae

Geckoes

|                              |               |  |  |  |   |  |   |   |   |   |   |   |
|------------------------------|---------------|--|--|--|---|--|---|---|---|---|---|---|
| <i>Christinus marmoratus</i> | Marbled Gecko |  |  |  | X |  | X | X | X | X | X | X |
|------------------------------|---------------|--|--|--|---|--|---|---|---|---|---|---|

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| Class<br>Family<br>Species                | Common<br>Name          | Conservation<br>Status | A | B | C | D | E | F | G | H | I | J |
|-------------------------------------------|-------------------------|------------------------|---|---|---|---|---|---|---|---|---|---|
| <b>Pygopodidae</b><br>Legless Lizards     |                         |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Aprasia repens</i>                     | Sandplain Worm Lizard   |                        |   |   |   |   |   |   |   |   |   | X |
| <i>Lialis burtonis</i>                    | Burton's Legless Lizard |                        |   |   | X |   | X | X | X | X |   | X |
| <b>Agamidae</b><br>Dragon Lizards         |                         |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Pogona minor</i>                       | Western Bearded Dragon  |                        |   |   | X |   | X | X | X | X |   | X |
| <b>Varanidae</b><br>Monitor's or Goanna's |                         |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Varanus gouldii</i>                    | Sand Monitor            |                        |   |   | X |   | X | X |   |   |   | X |
| <i>Varanus rosenbergi</i>                 | Heath Monitor           |                        |   |   | X |   | X |   |   |   |   | X |

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| Class<br>Family<br>Species         | Common<br>Name                   | Conservation<br>Status | A | B | C | D | E | F | G | H | I | J |
|------------------------------------|----------------------------------|------------------------|---|---|---|---|---|---|---|---|---|---|
| <b>Scincidae</b><br>Skinks         |                                  |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Acritoscincus trilineatum</i>   | Southwestern Cool Skink          |                        |   |   | X |   | X |   |   | X |   |   |
| <i>Cryptoblepharus buechananii</i> | Buchanan's Snake-eyed Skink      |                        |   |   | X |   | X |   |   | X | X | X |
| <i>Ctenotus fallens</i>            | West Coast Ctenotus              |                        |   |   |   |   |   | X |   |   |   | X |
| <i>Ctenotus impar</i>              | Odd-striped Ctenotus             |                        |   |   | X |   | X |   |   |   | X | X |
| <i>Ctenotus ora</i>                | Coastal Plains Skink             | P3                     |   |   | X |   | X |   |   |   |   | X |
| <i>Egernia kingii</i>              | King's Skink                     |                        |   |   |   | X |   | X |   |   |   | X |
| <i>Egernia naoleonis</i>           | Salmon-bellied Skink             |                        |   |   | X | X | X |   |   |   |   | X |
| <i>Hemiergis quadrilineata</i>     | Two-toed Mulch Skink             |                        |   |   | X |   | X | X | X | X | X | X |
| <i>Lerista elegans</i>             | West Coast Four-toed Lerista     |                        |   |   | X |   | X | X | X | X | X | X |
| <i>Menetia greyii</i>              | Dwarf Skink                      |                        |   | X | X | X | X | X | X | X |   | X |
| <i>Morethia lineocellata</i>       | West Coast Pale-flecked Morethia |                        |   |   | X | X | X | X | X | X | X | X |
| <i>Tiliqua rugosa</i>              | Bobtail                          |                        |   | X | X |   | X | X | X | X | X | X |
| <b>Typhlopidae</b><br>Blind Snakes |                                  |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Anilius australis</i>           | Southern Blind Snake             |                        |   |   |   |   | X | X |   | X | X |   |

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| Class<br>Family<br>Species       | Common<br>Name     | Conservation<br>Status | A | B | C | D | E | F | G | H | I | J |
|----------------------------------|--------------------|------------------------|---|---|---|---|---|---|---|---|---|---|
| <b>Elapidae</b><br>Elapid Snakes |                    |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Notechis scutatus</i>         | Tiger Snake        |                        |   |   | X |   | X | X |   |   |   | X |
| <i>Pseudonaja affinis</i>        | Dugite             |                        |   | X | X | X | X | X |   |   |   | X |
| <i>Simoselaps bertholdi</i>      | Jan's Banded Snake |                        |   |   | X |   |   | X |   | X | X | X |

## Aves

### Phasianidae

Quails, Pheasants

|                            |               |    |  |  |  |  |  |  |  |  |  |   |
|----------------------------|---------------|----|--|--|--|--|--|--|--|--|--|---|
| <i>Coturnix pectoralis</i> | Stubble Quail | LC |  |  |  |  |  |  |  |  |  | X |
|----------------------------|---------------|----|--|--|--|--|--|--|--|--|--|---|

### Anatidae

Geese, Swans, Ducks

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

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| Class<br>Family<br>Species                               | Common<br>Name        | Conservation<br>Status | A | B | C | D | E | F | G | H | I | J |
|----------------------------------------------------------|-----------------------|------------------------|---|---|---|---|---|---|---|---|---|---|
| <b>Accipitridae</b><br>Kites, Goshawks, Eagles, Harriers |                       |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Accipiter cirrocephalus</i>                           | Collared Sparrowhawk  | Bp LC                  |   |   |   |   |   |   |   |   | X | X |
| <i>Accipiter fasciatus</i>                               | Brown Goshawk         | Bp LC                  |   |   |   | X | X | X |   |   |   | X |
| <i>Aquila audax</i>                                      | Wedge-tailed Eagle    | Bp LC                  |   |   | X |   | X | X |   |   |   | X |
| <i>Aquila morphnoides</i>                                | Little Eagle          | Bp LC                  |   | X |   |   |   |   | X | X |   |   |
| <i>Elanus caeruleus</i>                                  | Black-shouldered Kite | LC                     |   |   |   | X | X |   | X |   |   |   |
| <i>Haliastur sphenurus</i>                               | Whistling Kite        | Bp LC                  |   | X | X |   | X |   |   |   |   | X |
| <i>Hamirostra isura</i>                                  | Square-tailed Kite    | Bp LC                  |   |   |   |   | X |   | X | X | X | X |
| <b>Falconidae</b><br>Falcons                             |                       |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Falco berigora</i>                                    | Brown Falcon          | Bp LC                  |   |   |   | X |   |   | X |   |   | X |
| <i>Falco cenchroides</i>                                 | Australian Kestrel    | LC                     |   | X | X | X | X | X | X |   | X | X |
| <i>Falco longipennis</i>                                 | Australian Hobby      | LC                     |   |   |   |   |   |   |   |   |   | X |
| <i>Falco peregrinus</i>                                  | Peregrine Falcon      | S7 Bp LC               |   |   |   | X |   | X |   |   |   | X |
| <b>Turnicidae</b><br>Button-quails                       |                       |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Turnix varia</i>                                      | Painted Button-quail  | Bp LC                  |   |   | X |   |   | X |   | X |   |   |

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

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

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

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|-------------------------------------------|---------------------------|------------------------|---|---|---|---|---|---|---|---|---|---|
| <b>Pardalotidae</b><br>Pardalotes         |                           |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Pardalotus punctatus</i>               | Spotted Pardalote         | LC                     |   |   | X | X |   |   |   |   |   | X |
| <i>Pardalotus striatus</i>                | Striated Pardalote        | LC                     | X | X | X | X | X | X | X | X | X | X |
| <b>Meliphagidae</b><br>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 | X | X | X |
| <i>Anthochaera lunulata</i>               | Western Little Wattlebird | Bp LC                  |   |   |   |   |   |   |   | X | X | X |
| <i>Lichenostomus virescens</i>            | Singing Honeyeater        | LC                     |   |   |   | X |   | X |   | X |   |   |
| <i>Lichmera indistincta</i>               | Brown Honeyeater          | LC                     | X |   | X | X | X | X |   | X | X | X |
| <i>Phylidonyris nigra</i>                 | White-cheeked Honeyeater  | Bp LC                  |   |   |   |   |   |   |   |   | X |   |
| <i>Phylidonyris novaehollandiae</i>       | New Holland Honeyeater    | Bp LC                  |   |   |   | X | X | X | X |   | X | X |
| <b>Petroicidae</b><br>Australian Robins   |                           |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Petroica multicolor</i>                | Scarlet Robin             | Bh LC                  |   |   | X |   | X |   |   |   |   |   |

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| Class<br>Family<br>Species                                                                 | Common<br>Name            | Conservation<br>Status | A | B | C | D | E | F | G | H | I | J |
|--------------------------------------------------------------------------------------------|---------------------------|------------------------|---|---|---|---|---|---|---|---|---|---|
| <b>Pachycephalidae</b><br>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 | X | X | X |   |   |
| <i>Pachycephala rufiventris</i>                                                            | Rufous Whistler           | LC                     |   | X | X | X |   |   |   | X | X | X |
| <b>Dicruridae</b><br>Monarchs, Magpie Lark, Flycatchers, Fantails, Drongo                  |                           |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Grallina cyanoleuca</i>                                                                 | Magpie-lark               | LC                     |   |   | X | X | X |   | X | X | X | X |
| <i>Rhipidura fuliginosa</i>                                                                | Grey Fantail              | LC                     | X |   | X | X | X | X | X | X | X |   |
| <i>Rhipidura leucophrys</i>                                                                | Willie Wagtail            | LC                     |   | X | X | X | X | X | X | X |   | X |
| <b>Campephagidae</b><br>Cuckoo-shrikes, Trillers                                           |                           |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Coracina novaehollandiae</i>                                                            | Black-faced Cuckoo-shrike | LC                     |   | X | X | X | X | X | X | X | X | X |
| <i>Lalage tricolor</i>                                                                     | White-winged Triller      | LC                     |   |   |   |   |   | X |   |   |   |   |
| <b>Artamidae</b><br>Woodswallows, Butcherbirds, Currawongs                                 |                           |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Artamus cinereus</i>                                                                    | Black-faced Woodswallow   | Bp LC                  |   |   |   | X | X |   |   |   |   | X |
| <i>Artamus cyanopterus</i>                                                                 | Dusky Woodswallow         | Bp LC                  |   |   | X | X |   |   |   |   |   | X |

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| Class<br>Family<br>Species                               | Common<br>Name    | Conservation<br>Status | A | B | C | D | E | F | G | H | I | J |
|----------------------------------------------------------|-------------------|------------------------|---|---|---|---|---|---|---|---|---|---|
| <b>Cracticidae</b><br>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 | X | X |
| <b>Corvidae</b><br>Ravens, Crows                         |                   |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Corvus coronoides</i>                                 | Australian Raven  | LC                     | X | X | X | X | X | X | X | X | X | X |
| <b>Motacillidae</b><br>Old World Pipits, Wagtails        |                   |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Anthus australis</i>                                  | Australian Pipit  | LC                     |   | X |   | X | X |   |   |   |   | X |
| <b>Hirundinidae</b><br>Swallows, Martins                 |                   |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Hirundo neoxena</i>                                   | Welcome Swallow   | LC                     |   | X | X | X | X |   |   | X | X | X |
| <i>Hirundo nigricans</i>                                 | Tree Martin       | LC                     | X | X | X |   | X |   | X | X | X |   |
| <b>Sylviidae</b><br>Old World Warblers                   |                   |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Cincloramphus cruralis</i>                            | Brown Songlark    | LC                     |   |   |   |   |   |   |   |   |   |   |
| <i>Cincloramphus mathewsi</i>                            | Rufous Songlark   | LC                     |   |   | X | X |   |   |   |   |   |   |
| <b>Zosteropidae</b><br>White-eyes                        |                   |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Zosterops lateralis</i>                               | Silvereye         | LC                     | X |   | X | X | X | X | X | X | X | X |

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| Class<br>Family<br>Species                          | Common<br>Name                        | Conservation<br>Status  | A | B | C | D | E | F | G | H | I | J |
|-----------------------------------------------------|---------------------------------------|-------------------------|---|---|---|---|---|---|---|---|---|---|
| <b>Mammalia</b>                                     |                                       |                         |   |   |   |   |   |   |   |   |   |   |
| <b>Dasyuridae</b><br>Carnivorous Marsupials         |                                       |                         |   |   |   |   |   |   |   |   |   |   |
| <i>Antechinus flavipes</i>                          | Yellow-footed Antechinus, Mardo       | LC                      |   |   |   |   |   |   |   |   |   |   |
| <i>Phascogale tapoatafa wambenger</i>               | South-western Brush-tailed Phascogale | S6 NT                   |   |   | X |   | X |   |   |   |   | X |
| <b>Peramelidae</b><br>Bandicoots                    |                                       |                         |   |   |   |   |   |   |   |   |   |   |
| <i>Isodon fusciventer</i>                           | Quenda                                | P4 LC                   |   |   | X |   | X |   |   |   |   | X |
| <b>Phalangeridae</b><br>Brushtail Possums, Cuscuses |                                       |                         |   |   |   |   |   |   |   |   |   |   |
| <i>Trichosurus vulpecula</i>                        | Common Brushtail Possum               | LC                      | X | X | X | X | X | X | X | X | X | X |
| <b>Burramyidae</b><br>Pygmy Possums                 |                                       |                         |   |   |   |   |   |   |   |   |   |   |
| <i>Cercartetus concinnus</i>                        | Western Pygmy-possum                  | LC                      |   |   |   |   | X |   |   |   |   | X |
| <b>Pseudocheiridae</b><br>Ringtail Possums          |                                       |                         |   |   |   |   |   |   |   |   |   |   |
| <i>Pseudocheirus occidentalis</i>                   | Western Ringtail Possum               | S1 CR CR A2bce+3bce+4bc | X | X |   | X | X | X |   |   |   | X |
| <b>Macropodidae</b><br>Kangaroos, Wallabies         |                                       |                         |   |   |   |   |   |   |   |   |   |   |
| <i>Macropus fuliginosus</i>                         | Western Grey Kangaroo                 | LC                      | X | X | X | X | X | X | X | X | X | X |

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| Class<br>Family<br>Species               | Common<br>Name                | Conservation<br>Status | A | B | C | D | E | F | G | H | I | J |
|------------------------------------------|-------------------------------|------------------------|---|---|---|---|---|---|---|---|---|---|
| <b>Molossidae</b><br>Freetail Bats       |                               |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Austronomus australis</i>             | White-striped Free-tailed Bat | LC                     |   |   | X |   | X | X | X |   |   |   |
| <i>Ozimops kitcheneri</i>                | Western Free-tailed Bat       | LC                     |   |   | X |   | X | X | X |   |   |   |
| <b>Vespertilionidae</b><br>Ordinary Bats |                               |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Chalinolobus gouldii</i>              | Gould's Wattled Bat           | LC                     |   |   | X |   | X | X |   |   | X | X |
| <i>Chalinolobus morio</i>                | Chocolate Wattled Bat         | LC                     |   |   | X |   | X |   |   |   |   |   |
| <i>Falsistrellus mackenziei</i>          | Western False Pipistrelle     | P4 NT                  |   |   | X |   | X |   |   |   |   | X |
| <i>Nyctophilus geoffroyi</i>             | Lesser Long-eared Bat         | LC                     |   |   | X |   | X |   |   |   |   | X |
| <i>Nyctophilus gouldi</i>                | Gould's Long-eared Bat        | LC                     |   |   | X |   |   |   |   |   |   | X |
| <i>Nyctophilus major major</i>           | Western Long-eared Bat        | LC                     |   |   | X |   | X |   |   |   | X |   |
| <i>Vespadelus regulus</i>                | Southern Forest Bat           | LC                     |   |   | X |   | X |   | X |   | X | X |
| <b>Muridae</b><br>Rats, Mice             |                               |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Mus musculus</i>                      | House Mouse                   | Introduced             |   |   | X |   |   | X | X | X | X | X |
| <i>Rattus rattus</i>                     | Black Rat                     | Introduced             |   |   | X |   |   |   |   |   |   | X |
| <b>Canidae</b><br>Dogs, Foxes            |                               |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Vulpes vulpes</i>                     | Red Fox                       | Introduced             |   | X | X | X | X | X | X | X | X | X |

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| Class<br>Family<br>Species         | Common<br>Name | Conservation<br>Status | A | B | C | D | E | F | G | H | I | J |
|------------------------------------|----------------|------------------------|---|---|---|---|---|---|---|---|---|---|
| <b>Felidae</b><br>Cats             |                |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Felis catus</i>                 | Cat            | Introduced             |   |   | X | X | X |   | X | X | X | X |
| <b>Leporidae</b><br>Rabbits, Hares |                |                        |   |   |   |   |   |   |   |   |   |   |
| <i>Oryctolagus cuniculus</i>       | Rabbit         | Introduced             |   | X | X | X | X | X | X | X | X | X |

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# **APPENDIX C**

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

# NatureMap - Kingston Drive

Created By Greg Harewood on 30/08/2018

**Kingdom** Animalia  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Method** 'By Circle'  
**Centre** 115° 44' 41" E, 33° 16' 35" S  
**Buffer** 20km  
**Group By** Species Group

| Species Group | Species    | Records      |
|---------------|------------|--------------|
| Amphibian     | 11         | 463          |
| Bird          | 223        | 15879        |
| Fish          | 73         | 193          |
| Invertebrate  | 106        | 435          |
| Mammal        | 44         | 2200         |
| Reptile       | 49         | 932          |
| <b>TOTAL</b>  | <b>506</b> | <b>20102</b> |

| Name ID          | Species Name                                                                        | Naturalised | Conservation Code | <sup>1</sup> Endemic To Query Area |
|------------------|-------------------------------------------------------------------------------------|-------------|-------------------|------------------------------------|
| <b>Amphibian</b> |                                                                                     |             |                   |                                    |
| 1.               | 25398 <i>Crinia georgiana</i> (Quacking Frog)                                       |             |                   |                                    |
| 2.               | 25399 <i>Crinia glauerti</i> (Clicking Frog)                                        |             |                   |                                    |
| 3.               | 25400 <i>Crinia insignifera</i> (Squelching Froglet)                                |             |                   |                                    |
| 4.               | 25401 <i>Crinia pseudinsignifera</i> (Bleating Froglet)                             |             |                   |                                    |
| 5.               | 25404 <i>Geocrinia leai</i> (Ticking Frog)                                          |             |                   |                                    |
| 6.               | 25410 <i>Heleioporus eyrei</i> (Moaning Frog)                                       |             |                   |                                    |
| 7.               | 25411 <i>Heleioporus inornatus</i> (Whooping Frog)                                  |             |                   |                                    |
| 8.               | 25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)                            |             |                   |                                    |
| 9.               | 25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)                               |             |                   |                                    |
| 10.              | 25388 <i>Litoria moorei</i> (Motorbike Frog)                                        |             |                   |                                    |
| 11.              | 25433 <i>Pseudophryne guentheri</i> (Crawling Toadlet)                              |             |                   |                                    |
| <b>Bird</b>      |                                                                                     |             |                   |                                    |
| 12.              | 24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)          |             |                   |                                    |
| 13.              | 24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)                        |             |                   |                                    |
| 14.              | 24262 <i>Acanthiza inornata</i> (Western Thornbill)                                 |             |                   |                                    |
| 15.              | 24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)                      |             |                   |                                    |
| 16.              | 25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)                         |             |                   |                                    |
| 17.              | 25536 <i>Accipiter fasciatus</i> (Brown Goshawk)                                    |             |                   |                                    |
| 18.              | 25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)                       |             |                   |                                    |
| 19.              | 41323 <i>Actitis hypoleucos</i> (Common Sandpiper)                                  |             | IA                |                                    |
| 20.              | 25544 <i>Aegotheles cristatus</i> (Australian Owlet-nightjar)                       |             |                   |                                    |
| 21.              | 24310 <i>Anas castanea</i> (Chestnut Teal)                                          |             |                   |                                    |
| 22.              | 24312 <i>Anas gracilis</i> (Grey Teal)                                              |             |                   |                                    |
| 23.              | 24313 <i>Anas platyrhynchos</i> (Mallard)                                           |             |                   |                                    |
| 24.              | <i>Anas platyrhynchos</i> subsp. <i>domesticus</i>                                  |             |                   |                                    |
| 25.              | 24315 <i>Anas rhynchotis</i> (Australasian Shoveler)                                |             |                   |                                    |
| 26.              | 24316 <i>Anas superciliosa</i> (Pacific Black Duck)                                 |             |                   |                                    |
| 27.              | 47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)                          |             |                   |                                    |
| 28.              | 24506 <i>Anous tenuirostris</i> subsp. <i>melanops</i> (Australian Lesser Noddy)    |             | T                 |                                    |
| 29.              | 24561 <i>Anthochaera carunculata</i> (Red Wattlebird)                               |             |                   |                                    |
| 30.              | 24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)                       |             |                   |                                    |
| 31.              | 25670 <i>Anthus australis</i> (Australian Pipit)                                    |             |                   |                                    |
| 32.              | 24285 <i>Aquila audax</i> (Wedge-tailed Eagle)                                      |             |                   |                                    |
| 33.              | 25558 <i>Ardea ibis</i> (Cattle Egret)                                              |             |                   |                                    |
| 34.              | 41324 <i>Ardea modesta</i> (great egret, white egret)                               |             |                   |                                    |
| 35.              | 24340 <i>Ardea novaehollandiae</i> (White-faced Heron)                              |             |                   |                                    |
| 36.              | 24341 <i>Ardea pacifica</i> (White-necked Heron)                                    |             |                   |                                    |
| 37.              | 41326 <i>Ardenna carneipes</i> (Flesh-footed Shearwater, Fleishy-footed Shearwater) |             | T                 |                                    |
| 38.              | 25736 <i>Arenaria interpres</i> (Ruddy Turnstone)                                   |             | IA                |                                    |
| 39.              | 25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)                             |             |                   |                                    |

|      | Name ID | Species Name                                                                                      | Naturalised | Conservation Code | <sup>1</sup> Endemic To Query Area |
|------|---------|---------------------------------------------------------------------------------------------------|-------------|-------------------|------------------------------------|
| 40.  | 24353   | <i>Artamus cyanopterus</i> (Dusky Woodswallow)                                                    |             |                   |                                    |
| 41.  | 24318   | <i>Aythya australis</i> (Hardhead)                                                                |             |                   |                                    |
| 42.  |         | <i>Barnardius zonarius</i>                                                                        |             |                   |                                    |
| 43.  | 24319   | <i>Biziura lobata</i> (Musk Duck)                                                                 |             |                   |                                    |
| 44.  | 24345   | <i>Botaurus poiciloptilus</i> (Australasian Bittern)                                              |             | T                 |                                    |
| 45.  | 24359   | <i>Burhinus grallarius</i> (Bush Stone-curlew)                                                    |             |                   |                                    |
| 46.  | 24721   | <i>Cacatua galerita</i> subsp. <i>galerita</i> (Sulphur-crested Cockatoo)                         | Y           |                   |                                    |
| 47.  | 25714   | <i>Cacatua pastinator</i> (Western Long-billed Corella)                                           |             |                   |                                    |
| 48.  | 25716   | <i>Cacatua sanguinea</i> (Little Corella)                                                         |             |                   |                                    |
| 49.  | 25598   | <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)                                              |             |                   |                                    |
| 50.  | 42307   | <i>Cacomantis pallidus</i> (Pallid Cuckoo)                                                        |             |                   |                                    |
| 51.  | 24779   | <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)                                                |             | IA                |                                    |
| 52.  | 24780   | <i>Calidris alba</i> (Sanderling)                                                                 |             | IA                |                                    |
| 53.  | 25738   | <i>Calidris canutus</i> (Red Knot, knot)                                                          |             | IA                |                                    |
| 54.  | 24784   | <i>Calidris ferruginea</i> (Curlew Sandpiper)                                                     |             | T                 |                                    |
| 55.  | 24788   | <i>Calidris ruficollis</i> (Red-necked Stint)                                                     |             | IA                |                                    |
| 56.  | 24790   | <i>Calidris tenuirostris</i> (Great Knot)                                                         |             | T                 |                                    |
| 57.  | 25717   | <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)                                        |             |                   |                                    |
| 58.  | 24731   | <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black Cockatoo)              |             | T                 |                                    |
| 59.  | 24733   | <i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)      |             | T                 |                                    |
| 60.  | 24734   | <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo) |             | T                 |                                    |
| 61.  | 48400   | <i>Calyptorhynchus</i> sp. (white-tailed black cockatoo)                                          |             | T                 |                                    |
| 62.  | 25575   | <i>Charadrius leschenaultii</i> (Greater Sand Plover)                                             |             | IA                |                                    |
| 63.  | 24377   | <i>Charadrius ruficapillus</i> (Red-capped Plover)                                                |             |                   |                                    |
| 64.  | 24321   | <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)                                        |             |                   |                                    |
| 65.  |         | <i>Chroicocephalus novaehollandiae</i>                                                            |             |                   |                                    |
| 66.  | 25601   | <i>Chrysococcyx lucidus</i> (Shining Bronze Cuckoo)                                               |             |                   |                                    |
| 67.  | 24432   | <i>Chrysococcyx lucidus</i> subsp. <i>plagosus</i> (Shining Bronze Cuckoo)                        |             |                   |                                    |
| 68.  | 24288   | <i>Circus approximans</i> (Swamp Harrier)                                                         |             |                   |                                    |
| 69.  | 24774   | <i>Cladorhynchus leucocephalus</i> (Banded Stilt)                                                 |             |                   |                                    |
| 70.  | 25675   | <i>Colluricincla harmonica</i> (Grey Shrike-thrush)                                               |             |                   |                                    |
| 71.  | 24399   | <i>Columba livia</i> (Domestic Pigeon)                                                            | Y           |                   |                                    |
| 72.  | 25568   | <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)                                       |             |                   |                                    |
| 73.  | 25592   | <i>Corvus coronoides</i> (Australian Raven)                                                       |             |                   |                                    |
| 74.  | 24417   | <i>Corvus coronoides</i> subsp. <i>perplexus</i> (Australian Raven)                               |             |                   |                                    |
| 75.  |         | <i>Corvus splendens</i> subsp. <i>protegatus</i>                                                  |             |                   |                                    |
| 76.  | 24671   | <i>Coturnix pectoralis</i> (Stubble Quail)                                                        |             |                   |                                    |
| 77.  | 25701   | <i>Coturnix ypsilophora</i> (Brown Quail)                                                         |             |                   |                                    |
| 78.  | 24420   | <i>Cracticus nigrogularis</i> (Pied Butcherbird)                                                  |             |                   |                                    |
| 79.  | 25595   | <i>Cracticus tibicen</i> (Australian Magpie)                                                      |             |                   |                                    |
| 80.  | 25596   | <i>Cracticus torquatus</i> (Grey Butcherbird)                                                     |             |                   |                                    |
| 81.  | 24322   | <i>Cygnus atratus</i> (Black Swan)                                                                |             |                   |                                    |
| 82.  | 30901   | <i>Dacelo novaeguineae</i> (Laughing Kookaburra)                                                  | Y           |                   |                                    |
| 83.  | 25673   | <i>Daphoenositta chrysoptera</i> (Varied Sittella)                                                |             |                   |                                    |
| 84.  | 25618   | <i>Diomedea exulans</i> (Wandering Albatross)                                                     |             | T                 |                                    |
| 85.  | 30836   | <i>Diomedea exulans</i> subsp. <i>exulans</i> (Snowy Albatross)                                   |             | T                 |                                    |
| 86.  | 24470   | <i>Dromaius novaehollandiae</i> (Emu)                                                             |             |                   |                                    |
| 87.  |         | <i>Egretta garzetta</i>                                                                           |             |                   |                                    |
| 88.  |         | <i>Egretta novaehollandiae</i>                                                                    |             |                   |                                    |
| 89.  |         | <i>Elanus axillaris</i>                                                                           |             |                   |                                    |
| 90.  | 47937   | <i>Elseya melanops</i> (Black-fronted Dotterel)                                                   |             |                   |                                    |
| 91.  |         | <i>Eolophus roseicapillus</i>                                                                     |             |                   |                                    |
| 92.  | 24651   | <i>Eopsaltria australis</i> subsp. <i>griseogularis</i> (Western Yellow Robin)                    |             |                   |                                    |
| 93.  | 24652   | <i>Eopsaltria georgiana</i> (White-breasted Robin)                                                |             |                   |                                    |
| 94.  | 24567   | <i>Epthianura albifrons</i> (White-fronted Chat)                                                  |             |                   |                                    |
| 95.  | 24379   | <i>Erythronyx cinctus</i> (Red-kneed Dotterel)                                                    |             |                   |                                    |
| 96.  | 24813   | <i>Eudyptes chrysocome</i> subsp. <i>filholi</i> (Rockhopper Penguin)                             |             |                   | Y                                  |
| 97.  | 25746   | <i>Eudyptula minor</i> (Little Penguin)                                                           |             |                   |                                    |
| 98.  | 24368   | <i>Eurostopodus argus</i> (Spotted Nightjar)                                                      |             |                   |                                    |
| 99.  | 25621   | <i>Falco berigora</i> (Brown Falcon)                                                              |             |                   |                                    |
| 100. | 25622   | <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)                                    |             |                   |                                    |
| 101. | 24472   | <i>Falco cenchroides</i> subsp. <i>cenchrus</i> (Australian Kestrel, Nankeen Kestrel)             |             |                   |                                    |
| 102. | 25623   | <i>Falco longipennis</i> (Australian Hobby)                                                       |             |                   |                                    |
| 103. | 25624   | <i>Falco peregrinus</i> (Peregrine Falcon)                                                        |             | S                 |                                    |
| 104. | 25727   | <i>Fulica atra</i> (Eurasian Coot)                                                                |             |                   |                                    |
| 105. | 24761   | <i>Fulica atra</i> subsp. <i>australis</i> (Eurasian Coot)                                        |             |                   |                                    |
| 106. | 25729   | <i>Gallinula tenebrosa</i> (Dusky Moorhen)                                                        |             |                   |                                    |
| 107. | 24763   | <i>Gallinula tenebrosa</i> subsp. <i>tenebrosa</i> (Dusky Moorhen)                                |             |                   |                                    |

|      | Name ID | Species Name                                                               | Naturalised | Conservation Code | <sup>1</sup> Endemic To Query Area |
|------|---------|----------------------------------------------------------------------------|-------------|-------------------|------------------------------------|
| 108. | 25730   | <i>Gallirallus philippensis</i> (Buff-banded Rail)                         |             |                   |                                    |
| 109. | 24765   | <i>Gallirallus philippensis</i> subsp. <i>mellori</i> (Buff-banded Rail)   |             |                   |                                    |
| 110. | 25530   | <i>Gerygone fusca</i> (Western Gerygone)                                   |             |                   |                                    |
| 111. | 24481   | <i>Glareola maldivarum</i> (Oriental Pratincole)                           |             | IA                |                                    |
| 112. | 24443   | <i>Grallina cyanoleuca</i> (Magpie-lark)                                   |             |                   |                                    |
| 113. | 24487   | <i>Haematopus longirostris</i> (Pied Oystercatcher)                        |             |                   |                                    |
| 114. | 24293   | <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)                    |             |                   |                                    |
| 115. | 24295   | <i>Haliastur spheurnus</i> (Whistling Kite)                                |             |                   |                                    |
| 116. | 24689   | <i>Halobaena caerulea</i> (Blue Petrel)                                    |             |                   |                                    |
| 117. | 24296   | <i>Hamirostra isura</i> (Square-tailed Kite)                               |             |                   |                                    |
| 118. | 47965   | <i>Hieraaetus morphnoides</i> (Little Eagle)                               |             |                   |                                    |
| 119. | 25734   | <i>Himantopus himantopus</i> (Black-winged Stilt)                          |             |                   |                                    |
| 120. | 24491   | <i>Hirundo neoxena</i> (Welcome Swallow)                                   |             |                   |                                    |
| 121. | 48587   | <i>Hydroprogne caspia</i> (Caspian Tern)                                   |             | IA                |                                    |
| 122. | 47975   | <i>Ixobrychus dubius</i> (Australian Little Bittern)                       |             | P4                |                                    |
| 123. | 24511   | <i>Larus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Silver Gull)   |             |                   |                                    |
| 124. | 25638   | <i>Larus pacificus</i> (Pacific Gull)                                      |             |                   |                                    |
| 125. | 25661   | <i>Lichmera indistincta</i> (Brown Honeyeater)                             |             |                   |                                    |
| 126. | 30932   | <i>Limosa lapponica</i> (Bar-tailed Godwit)                                |             | IA                |                                    |
| 127. | 25741   | <i>Limosa limosa</i> (Black-tailed Godwit)                                 |             | IA                |                                    |
| 128. | 24690   | <i>Macronectes giganteus</i> (Southern Giant Petrel)                       |             | IA                |                                    |
| 129. | 24326   | <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)                       |             |                   |                                    |
| 130. | 25650   | <i>Malurus elegans</i> (Red-winged Fairy-wren)                             |             |                   |                                    |
| 131. | 25654   | <i>Malurus splendens</i> (Splendid Fairy-wren)                             |             |                   |                                    |
| 132. | 25758   | <i>Megalurus gramineus</i> (Little Grassbird)                              |             |                   |                                    |
| 133. | 25663   | <i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)                 |             |                   |                                    |
| 134. | 24598   | <i>Merops ornatus</i> (Rainbow Bee-eater)                                  |             |                   |                                    |
| 135. |         | <i>Microcarbo melanoleucos</i>                                             |             |                   |                                    |
| 136. | 48008   | <i>Morus serrator</i> (Australasian Gannet)                                |             |                   |                                    |
| 137. | 25610   | <i>Myiagra inquieta</i> (Restless Flycatcher)                              |             |                   |                                    |
| 138. | 24738   | <i>Neophema elegans</i> (Elegant Parrot)                                   |             |                   |                                    |
| 139. | 24739   | <i>Neophema petrophila</i> (Rock Parrot)                                   |             |                   |                                    |
| 140. | 24798   | <i>Numenius madagascariensis</i> (Eastern Curlew)                          |             | T                 |                                    |
| 141. | 25742   | <i>Numenius phaeopus</i> (Whimbrel)                                        |             | IA                |                                    |
| 142. | 25564   | <i>Nycticorax caledonicus</i> (Rufous Night Heron)                         |             |                   |                                    |
| 143. | 24497   | <i>Oceanites oceanicus</i> (Wilson's Storm-petrel)                         |             | IA                |                                    |
| 144. | 24407   | <i>Ocyphaps lophotes</i> (Crested Pigeon)                                  |             |                   |                                    |
| 145. | 41347   | <i>Onychoprion anaethetus</i> (Bridled Tern)                               |             | IA                |                                    |
| 146. | 24328   | <i>Oxyura australis</i> (Blue-billed Duck)                                 |             | P4                |                                    |
| 147. | 25680   | <i>Pachycephala rufiventris</i> (Rufous Whistler)                          |             |                   |                                    |
| 148. | 24692   | <i>Pachyptila belcheri</i> (Slender-billed Prion)                          |             |                   |                                    |
| 149. | 24693   | <i>Pachyptila desolata</i> (Antarctic Prion)                               |             |                   |                                    |
| 150. | 25707   | <i>Pachyptila salvini</i> (Salvin's Prion)                                 |             |                   |                                    |
| 151. | 48591   | <i>Pandion cristatus</i> (Osprey, Eastern Osprey)                          |             | IA                |                                    |
| 152. | 25681   | <i>Pardalotus punctatus</i> (Spotted Pardalote)                            |             |                   |                                    |
| 153. | 25682   | <i>Pardalotus striatus</i> (Striated Pardalote)                            |             |                   |                                    |
| 154. | 25687   | <i>Passer domesticus</i> (House Sparrow)                                   | Y           |                   |                                    |
| 155. | 24642   | <i>Passer montanus</i> (Eurasian Tree Sparrow)                             | Y           |                   |                                    |
| 156. | 24649   | <i>Pelecanoides urinatrix</i> subsp. <i>exsul</i> (Common Diving Petrel)   |             |                   |                                    |
| 157. | 24648   | <i>Pelecanus conspicillatus</i> (Australian Pelican)                       |             |                   |                                    |
| 158. | 48061   | <i>Petrochelidon nigricans</i> (Tree Martin)                               |             |                   |                                    |
| 159. | 48066   | <i>Petroica boodang</i> (Scarlet Robin)                                    |             |                   |                                    |
| 160. | 25697   | <i>Phalacrocorax carbo</i> (Great Cormorant)                               |             |                   |                                    |
| 161. | 24664   | <i>Phalacrocorax carbo</i> subsp. <i>novaehollandiae</i> (Great Cormorant) |             |                   |                                    |
| 162. | 24665   | <i>Phalacrocorax fuscescens</i> (Black-faced Cormorant)                    |             |                   |                                    |
| 163. | 25698   | <i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)                  |             |                   |                                    |
| 164. | 24667   | <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)                 |             |                   |                                    |
| 165. | 25699   | <i>Phalacrocorax varius</i> (Pied Cormorant)                               |             |                   |                                    |
| 166. | 24668   | <i>Phalacrocorax varius</i> subsp. <i>hypoleucos</i> (Pied Cormorant)      |             |                   |                                    |
| 167. | 24409   | <i>Phaps chalcoptera</i> (Common Bronzewing)                               |             |                   |                                    |
| 168. | 25587   | <i>Phaps elegans</i> (Brush Bronzewing)                                    |             |                   |                                    |
| 169. | 48071   | <i>Phylidonyris niger</i> (White-cheeked Honeyeater)                       |             |                   |                                    |
| 170. | 24596   | <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)               |             |                   |                                    |
| 171. | 24841   | <i>Platalea flavipes</i> (Yellow-billed Spoonbill)                         |             |                   |                                    |
| 172. | 24842   | <i>Platalea regia</i> (Royal Spoonbill)                                    |             |                   |                                    |
| 173. | 25720   | <i>Platycercus icterotis</i> (Western Rosella)                             |             |                   |                                    |
| 174. | 24745   | <i>Platycercus icterotis</i> subsp. <i>icterotis</i> (Western Rosella)     |             |                   |                                    |
| 175. | 24747   | <i>Platycercus spurius</i> (Red-capped Parrot)                             |             |                   |                                    |
| 176. | 25721   | <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)      |             |                   |                                    |
| 177. | 24843   | <i>Plegadis falcinellus</i> (Glossy Ibis)                                  |             | IA                |                                    |

|      | Name ID | Species Name                                                                                                | Naturalised | Conservation Code | <sup>1</sup> Endemic To Query Area |
|------|---------|-------------------------------------------------------------------------------------------------------------|-------------|-------------------|------------------------------------|
| 178. | 24382   | <i>Pluvialis fulva</i> (Pacific Golden Plover)                                                              |             | IA                |                                    |
| 179. | 24383   | <i>Pluvialis squatarola</i> (Grey Plover)                                                                   |             | IA                |                                    |
| 180. | 25703   | <i>Podargus strigoides</i> (Tawny Frogmouth)                                                                |             |                   |                                    |
| 181. | 25704   | <i>Podiceps cristatus</i> (Great Crested Grebe)                                                             |             |                   |                                    |
| 182. | 24681   | <i>Polycephalus polycephalus</i> (Hoary-headed Grebe)                                                       |             |                   |                                    |
| 183. | 25722   | <i>Polytelis anthopeplus</i> (Regent Parrot)                                                                |             |                   |                                    |
| 184. | 25731   | <i>Porphyrio porphyrio</i> (Purple Swamphen)                                                                |             |                   |                                    |
| 185. | 24767   | <i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)                                           |             |                   |                                    |
| 186. | 24769   | <i>Porzana fluminea</i> (Australian Spotted Crane)                                                          |             |                   |                                    |
| 187. | 25732   | <i>Porzana pusilla</i> (Baillon's Crane)                                                                    |             |                   |                                    |
| 188. | 24771   | <i>Porzana tabuensis</i> (Spotless Crane)                                                                   |             |                   |                                    |
| 189. | 24388   | <i>Psophodes nigrogularis</i> subsp. <i>nigrogularis</i> (Western Whipbird (western heath))                 |             | T                 |                                    |
| 190. | 24702   | <i>Pterodroma brevirostris</i> (Kerguelen Petrel)                                                           |             |                   |                                    |
| 191. | 24703   | <i>Pterodroma lessonii</i> (White-headed Petrel)                                                            |             |                   |                                    |
| 192. |         | <i>Pterodroma macroptera</i> subsp. <i>macroptera</i>                                                       |             |                   |                                    |
| 193. | 25711   | <i>Pterodroma mollis</i> (Soft-plumaged Petrel)                                                             |             |                   |                                    |
| 194. | 24711   | <i>Puffinus assimilis</i> subsp. <i>assimilis</i> (Little Shearwater)                                       |             |                   |                                    |
| 195. |         | <i>Purpureicephalus spurius</i>                                                                             |             |                   |                                    |
| 196. | 24776   | <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)                                                    |             |                   |                                    |
| 197. | 48096   | <i>Rhipidura albiscapa</i> (Grey Fantail)                                                                   |             |                   |                                    |
| 198. | 25614   | <i>Rhipidura leucophrys</i> (Willie Wagtail)                                                                |             |                   |                                    |
| 199. | 25616   | <i>Rhipidura rufiventris</i> (Northern Fantail)                                                             |             |                   |                                    |
| 200. | 25534   | <i>Sericornis frontalis</i> (White-browed Scrubwren)                                                        |             |                   |                                    |
| 201. | 30948   | <i>Smicornis brevirostris</i> (Weebill)                                                                     |             |                   |                                    |
| 202. | 24645   | <i>Stagonopleura oculata</i> (Red-eared Firetail)                                                           |             |                   |                                    |
| 203. | 24522   | <i>Sterna bergii</i> (Crested Tern)                                                                         |             |                   |                                    |
| 204. | 25642   | <i>Sterna hirundo</i> (Common Tern)                                                                         |             | IA                |                                    |
| 205. | 48594   | <i>Sternula nereis</i> (Fairy Tern)                                                                         |             |                   |                                    |
| 206. | 24329   | <i>Stictonetta naevosa</i> (Freckled Duck)                                                                  |             |                   |                                    |
| 207. | 25655   | <i>Stipiturus malachurus</i> (Southern Emu-wren)                                                            |             |                   |                                    |
| 208. | 24554   | <i>Stipiturus malachurus</i> subsp. <i>westernensis</i> (Southern Emu-wren)                                 |             |                   |                                    |
| 209. | 25597   | <i>Strepera versicolor</i> (Grey Currawong)                                                                 |             |                   |                                    |
| 210. | 25589   | <i>Streptopelia chinensis</i> (Spotted Turtle-Dove)                                                         | Y           |                   |                                    |
| 211. | 25590   | <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)                                                     | Y           |                   |                                    |
| 212. | 25705   | <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)                               |             |                   |                                    |
| 213. | 24682   | <i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe, Black-throated Grebe) |             |                   |                                    |
| 214. | 24331   | <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)                                             |             |                   |                                    |
| 215. | 34134   | <i>Thalassarche carteri</i> (Indian Yellow-nosed Albatross)                                                 |             | T                 |                                    |
| 216. | 44607   | <i>Thalassarche melanophrys</i> (Black-browed Albatross)                                                    |             | T                 |                                    |
| 217. | 48597   | <i>Thalasseus bergii</i> (Crested Tern)                                                                     |             | IA                |                                    |
| 218. | 48135   | <i>Thinornis rubricollis</i> (Hooded Plover, Hooded Dotterel)                                               |             | P4                |                                    |
| 219. | 24845   | <i>Threskiornis spinicollis</i> (Straw-necked Ibis)                                                         |             |                   |                                    |
| 220. | 25549   | <i>Todiramphus sanctus</i> (Sacred Kingfisher)                                                              |             |                   |                                    |
| 221. | 24309   | <i>Todiramphus sanctus</i> subsp. <i>sanctus</i> (Sacred Kingfisher)                                        |             |                   |                                    |
| 222. | 48141   | <i>Tribonyx ventralis</i> (Black-tailed Native-hen)                                                         |             |                   |                                    |
| 223. | 25723   | <i>Trichoglossus haematodus</i> (Rainbow Lorikeet)                                                          |             |                   |                                    |
| 224. | 24755   | <i>Trichoglossus haematodus</i> subsp. <i>moluccanus</i> (Rainbow Lorikeet)                                 | Y           |                   |                                    |
| 225. | 24803   | <i>Tringa brevipes</i> (Grey-tailed Tattler)                                                                |             | P4                |                                    |
| 226. | 24806   | <i>Tringa glareola</i> (Wood Sandpiper)                                                                     |             | IA                |                                    |
| 227. | 24808   | <i>Tringa nebularia</i> (Common Greenshank, greenshank)                                                     |             | IA                |                                    |
| 228. | 24809   | <i>Tringa stagnatilis</i> (Marsh Sandpiper, little greenshank)                                              |             | IA                |                                    |
| 229. | 48147   | <i>Turnix varius</i> (Painted Button-quail)                                                                 |             |                   |                                    |
| 230. | 24852   | <i>Tyto alba</i> subsp. <i>delicatula</i> (Barn Owl)                                                        |             |                   |                                    |
| 231. | 25577   | <i>Vanellus miles</i> (Masked Lapwing)                                                                      |             |                   |                                    |
| 232. | 24386   | <i>Vanellus tricolor</i> (Banded Lapwing)                                                                   |             |                   |                                    |
| 233. | 41351   | <i>Xenus cinereus</i> (Terek Sandpiper)                                                                     |             | IA                |                                    |
| 234. | 25765   | <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)                                             |             |                   |                                    |

## Fish

|      |                                  |
|------|----------------------------------|
| 235. | <i>Acentrogobius bifrenatus</i>  |
| 236. | <i>Aetapcus maculatus</i>        |
| 237. | <i>Aldrichetta forsteri</i>      |
| 238. | <i>Anoplocapros lenticularis</i> |
| 239. | <i>Aracana aurita</i>            |
| 240. | <i>Arenigobius bifrenatus</i>    |
| 241. | <i>Arripis truttacea</i>         |
| 242. | <i>Asymbolus submaculatus</i>    |
| 243. | <i>Atherinosoma elongata</i>     |
| 244. | <i>Aulohaelurus labiosus</i>     |
| 245. | <i>Auxis thazard</i>             |

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|---------------------|------------------------------------------------------------------------------------------|-------------|-------------------|------------------------------------|
| 246.                | <i>Carcharhinus</i> sp.                                                                  |             |                   |                                    |
| 247.                | 34031 <i>Carcharodon carcharias</i> (Great White Shark)                                  |             | T                 |                                    |
| 248.                | <i>Chelidonichthys kumu</i>                                                              |             |                   |                                    |
| 249.                | <i>Cleidopus gloriamaris</i>                                                             |             |                   |                                    |
| 250.                | <i>Dactylophora nigricans</i>                                                            |             |                   |                                    |
| 251.                | <i>Diodon nichthemerus</i>                                                               |             |                   |                                    |
| 252.                | <i>Diodon</i> sp.                                                                        |             |                   |                                    |
| 253.                | <i>Echeneis naucrates</i>                                                                |             |                   |                                    |
| 254.                | <i>Edelia vittata</i>                                                                    |             |                   |                                    |
| 255.                | <i>Elops hawaiiensis</i>                                                                 |             |                   |                                    |
| 256.                | <i>Eubalichthys</i> sp.                                                                  |             |                   |                                    |
| 257.                | <i>Euleptorhamphus viridis</i>                                                           |             |                   |                                    |
| 258.                | <i>Furgaleus macki</i>                                                                   |             |                   |                                    |
| 259.                | 34028 <i>Galaxias occidentalis</i> (Western Minnow)                                      |             |                   |                                    |
| 260.                | 34027 <i>Galaxiella nigrostriata</i> (Black-stripe Minnow, black-striped dwarf galaxias) |             | T                 |                                    |
| 261.                | <i>Galeorhinus galeus</i>                                                                |             |                   |                                    |
| 262.                | <i>Gambusia affinis</i>                                                                  |             |                   |                                    |
| 263.                | 34030 <i>Geotria australis</i> (Pouched Lamprey)                                         |             | P1                |                                    |
| 264.                | <i>Gonorynchus greyi</i>                                                                 |             |                   |                                    |
| 265.                | <i>Gymnapistes marmoratus</i>                                                            |             |                   |                                    |
| 266.                | <i>Gymnothorax woodwardi</i>                                                             |             |                   |                                    |
| 267.                | <i>Hemipristis elongata</i>                                                              |             |                   |                                    |
| 268.                | <i>Heterodontus portusjacksoni</i>                                                       |             |                   |                                    |
| 269.                | <i>Hippocampus</i> sp.                                                                   |             |                   |                                    |
| 270.                | <i>Hyperlophus vittatus</i>                                                              |             |                   |                                    |
| 271.                | <i>Hyporhamphus melanochir</i>                                                           |             |                   |                                    |
| 272.                | <i>Ichthyoscopus barbatus</i>                                                            |             |                   |                                    |
| 273.                | <i>Lagocephalus scleratus</i>                                                            |             |                   |                                    |
| 274.                | <i>Macroramphosus scolopax</i>                                                           |             |                   |                                    |
| 275.                | <i>Makaira indica</i>                                                                    |             |                   |                                    |
| 276.                | <i>Meuschenia freycineti</i>                                                             |             |                   |                                    |
| 277.                | <i>Mugil cephalus</i>                                                                    |             |                   |                                    |
| 278.                | <i>Muraenichthys tasmaniensis</i>                                                        |             |                   |                                    |
| 279.                | <i>Myliobatis</i> sp.                                                                    |             |                   |                                    |
| 280.                | <i>Nannoperca vittata</i>                                                                |             |                   |                                    |
| 281.                | <i>Nelusetta ayraudi</i>                                                                 |             |                   |                                    |
| 282.                | <i>Omegophora armilla</i>                                                                |             |                   |                                    |
| 283.                | <i>Ophisurus serpens</i>                                                                 |             |                   |                                    |
| 284.                | <i>Ophthalmolepis lineolatus</i>                                                         |             |                   |                                    |
| 285.                | <i>Parablennius postoculomaculatus</i>                                                   |             |                   |                                    |
| 286.                | <i>Parazanclostius hutchinsi</i>                                                         |             |                   |                                    |
| 287.                | <i>Phyllopteryx taeniolatus</i>                                                          |             |                   |                                    |
| 288.                | <i>Platycephalus speculator</i>                                                          |             |                   |                                    |
| 289.                | <i>Prionace glauca</i>                                                                   |             |                   |                                    |
| 290.                | <i>Pristiophorus nudipinnis</i>                                                          |             |                   |                                    |
| 291.                | <i>Pseudogobius olorum</i>                                                               |             |                   |                                    |
| 292.                | <i>Pterygotrigla polyommata</i>                                                          |             |                   |                                    |
| 293.                | <i>Rachycentron canadum</i>                                                              |             |                   |                                    |
| 294.                | <i>Scobinichthys granulatus</i>                                                          |             |                   |                                    |
| 295.                | <i>Scomber australasicus</i>                                                             |             |                   |                                    |
| 296.                | <i>Sillago fraseri</i> (invalid)                                                         |             |                   | Y                                  |
| 297.                | <i>Sphyræna obtusata</i>                                                                 |             |                   |                                    |
| 298.                | <i>Squalus megalops</i>                                                                  |             |                   |                                    |
| 299.                | <i>Squatina australis</i>                                                                |             |                   |                                    |
| 300.                | <i>Stigmatopora argus</i>                                                                |             |                   |                                    |
| 301.                | <i>Thyrssites atun</i>                                                                   |             |                   |                                    |
| 302.                | <i>Trachinotus baillonii</i>                                                             |             |                   |                                    |
| 303.                | <i>Trachurus novaezelandiae</i>                                                          |             |                   |                                    |
| 304.                | <i>Trichiurus lepturus</i>                                                               |             |                   |                                    |
| 305.                | <i>Trichiurus</i> sp.                                                                    |             |                   |                                    |
| 306.                | <i>Trygonoptera mucosa</i>                                                               |             |                   |                                    |
| 307.                | <i>Urolophus</i> sp.                                                                     |             |                   |                                    |
| <b>Invertebrate</b> |                                                                                          |             |                   |                                    |
| 308.                | <i>Acariformes</i> sp.                                                                   |             |                   |                                    |
| 309.                | <i>Aeshnidae</i> sp.                                                                     |             |                   |                                    |
| 310.                | <i>Aganippe raphiduca</i>                                                                |             |                   |                                    |
| 311.                | <i>Allothreua maculata</i>                                                               |             |                   |                                    |
| 312.                | <i>Amblyomma triguttatum</i>                                                             |             |                   |                                    |
| 313.                | <i>Aname mainae</i>                                                                      |             |                   |                                    |
| 314.                | <i>Aname tepperi</i>                                                                     |             |                   |                                    |

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|---------|---------------------------------------------------|-------------|-------------------|------------------------------------|
| 315.    | <i>Ancylidae</i> sp.                              |             |                   |                                    |
| 316.    | <i>Arachnura higginsi</i>                         |             |                   |                                    |
| 317.    | <i>Araneus senicaudatus</i> subsp. <i>simplex</i> |             |                   | Y                                  |
| 318.    | <i>Argiope protensa</i>                           |             |                   |                                    |
| 319.    | <i>Argiope trifasciata</i>                        |             |                   |                                    |
| 320.    | <i>Arkys walckenaeri</i>                          |             |                   |                                    |
| 321.    | <i>Artoria linnaei</i>                            |             |                   |                                    |
| 322.    | <i>Artoriopsis expolita</i>                       |             |                   |                                    |
| 323.    | <i>Austracantha minax</i>                         |             |                   |                                    |
| 324.    | <i>Backobourkia brounii</i>                       |             |                   |                                    |
| 325.    | <i>Backobourkia heroine</i>                       |             |                   |                                    |
| 326.    | <i>Badumna insignis</i>                           |             |                   |                                    |
| 327.    | <i>Baetidae</i> sp.                               |             |                   |                                    |
| 328.    | <i>Baiami volucripes</i>                          |             |                   |                                    |
| 329.    | <i>Caenidae</i> sp.                               |             |                   |                                    |
| 330.    | <i>Calamoecia clitellata</i>                      |             |                   |                                    |
| 331.    | <i>Carabidae</i> sp.                              |             |                   |                                    |
| 332.    | <i>Celaenia excavata</i>                          |             |                   |                                    |
| 333.    | <i>Ceratopogonidae</i> sp.                        |             |                   |                                    |
| 334.    | <i>Cercophonius sulcatus</i>                      |             |                   |                                    |
| 335.    | 33939 <i>Cherax cainii</i> (Marron)               |             |                   |                                    |
| 336.    | <i>Cherax quinquecarinatus</i>                    |             |                   |                                    |
| 337.    | <i>Chironominae</i> sp.                           |             |                   |                                    |
| 338.    | <i>Corduliidae</i> sp.                            |             |                   |                                    |
| 339.    | <i>Corixidae</i> sp.                              |             |                   |                                    |
| 340.    | <i>Cormocephalus aurantiipes</i>                  |             |                   |                                    |
| 341.    | <i>Cormocephalus hartmeyerii</i>                  |             |                   |                                    |
| 342.    | <i>Cormocephalus strigosus</i>                    |             |                   |                                    |
| 343.    | <i>Cryptoerithus quobba</i>                       |             |                   |                                    |
| 344.    | <i>Culicidae</i> sp.                              |             |                   |                                    |
| 345.    | <i>Cyclosa trilobata</i>                          |             |                   |                                    |
| 346.    | <i>Cyrtophora parnasia</i>                        |             |                   |                                    |
| 347.    | <i>Dingosa serrata</i>                            |             |                   |                                    |
| 348.    | <i>Dolichopodidae</i> sp.                         |             |                   |                                    |
| 349.    | <i>Dytiscidae</i> sp.                             |             |                   |                                    |
| 350.    | <i>Ecnomidae</i> sp.                              |             |                   |                                    |
| 351.    | <i>Erigone prominens</i>                          |             |                   |                                    |
| 352.    | <i>Eriophora biapicata</i>                        |             |                   |                                    |
| 353.    | <i>Gripopterygidae</i> sp.                        |             |                   |                                    |
| 354.    | <i>Gyrinidae</i> sp.                              |             |                   |                                    |
| 355.    | <i>Hemicorduliidae</i> sp.                        |             |                   |                                    |
| 356.    | <i>Henicops dentatus</i>                          |             |                   |                                    |
| 357.    | <i>Hogna crispipes</i>                            |             |                   |                                    |
| 358.    | <i>Hydrobiosidae</i> sp.                          |             |                   |                                    |
| 359.    | <i>Hydrophilidae</i> sp.                          |             |                   |                                    |
| 360.    | <i>Hydropsychidae</i> sp.                         |             |                   |                                    |
| 361.    | <i>Hypsimetopodidae</i> sp.                       |             |                   |                                    |
| 362.    | <i>Isopeda leishmanni</i>                         |             |                   |                                    |
| 363.    | <i>Kangarosa properipes</i>                       |             |                   |                                    |
| 364.    | <i>Laetesia mollita</i>                           |             |                   |                                    |
| 365.    | <i>Lampona cylindrata</i>                         |             |                   |                                    |
| 366.    | <i>Lampona punctigera</i>                         |             |                   |                                    |
| 367.    | <i>Latrodectus hasseltii</i>                      |             |                   |                                    |
| 368.    | <i>Leptoceridae</i> sp.                           |             |                   |                                    |
| 369.    | <i>Leptophlebiidae</i> sp.                        |             |                   |                                    |
| 370.    | <i>Missulena granulosa</i>                        |             |                   |                                    |
| 371.    | <i>Missulena hoggi</i>                            |             |                   |                                    |
| 372.    | <i>Missulena occatoria</i>                        |             |                   |                                    |
| 373.    | <i>Mituliodon tarantulinus</i>                    |             |                   |                                    |
| 374.    | <i>Mitzoruga insularis</i>                        |             |                   |                                    |
| 375.    | <i>Nephila edulis</i>                             |             |                   |                                    |
| 376.    | <i>Nicodamus mainae</i>                           |             |                   |                                    |
| 377.    | <i>Notonectidae</i> sp.                           |             |                   |                                    |
| 378.    | <i>Nunciella aspera</i>                           |             |                   |                                    |
| 379.    | <i>Oligochaeta</i> sp.                            |             |                   |                                    |
| 380.    | <i>Oniscidae</i> sp.                              |             |                   |                                    |
| 381.    | <i>Oniscigastridae</i> sp.                        |             |                   |                                    |
| 382.    | <i>Orthocladinae</i> sp.                          |             |                   |                                    |
| 383.    | <i>Palaemonidae</i> sp.                           |             |                   |                                    |
| 384.    | <i>Parastacidae</i> sp.                           |             |                   |                                    |

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|---------------|--------------------------------------------------------------------------------------------------------------|-------------|-------------------|------------------------------------|
| 385.          | <i>Perthiidae</i> sp.                                                                                        |             |                   |                                    |
| 386.          | <i>Pholcus phalangioides</i>                                                                                 |             |                   |                                    |
| 387.          | <i>Phryganoporus candidus</i>                                                                                |             |                   |                                    |
| 388.          | <i>Platorish gelorup</i>                                                                                     |             |                   |                                    |
| 389.          | <i>Raveniella arenacea</i>                                                                                   |             |                   |                                    |
| 390.          | <i>Raveniella peckorum</i>                                                                                   |             |                   |                                    |
| 391.          | <i>Scirtidae</i> sp.                                                                                         |             |                   |                                    |
| 392.          | <i>Scolopendra laeta</i>                                                                                     |             |                   |                                    |
| 393.          | <i>Simuliidae</i> sp.                                                                                        |             |                   |                                    |
| 394.          | <i>Staphylinidae</i> sp.                                                                                     |             |                   |                                    |
| 395.          | <i>Steatoda capensis</i>                                                                                     |             |                   |                                    |
| 396.          | <i>Steatoda grossa</i>                                                                                       |             |                   |                                    |
| 397.          | <i>Styloniscidae</i> sp.                                                                                     |             |                   |                                    |
| 398.          | <i>Synsphyronus magnus</i>                                                                                   |             |                   |                                    |
| 399.          | <i>Synthemistidae</i> sp.                                                                                    |             |                   |                                    |
| 400.          | <i>Talitridae</i> sp.                                                                                        |             |                   |                                    |
| 401.          | <i>Tamopsis distinguenda</i>                                                                                 |             |                   |                                    |
| 402.          | <i>Tanypodinae</i> sp.                                                                                       |             |                   |                                    |
| 403.          | <i>Tasmanicosa leuckartii</i>                                                                                |             |                   |                                    |
| 404.          | <i>Telephlebiidae</i> sp.                                                                                    |             |                   |                                    |
| 405.          | <i>Temnocephalidea</i> sp.                                                                                   |             |                   |                                    |
| 406.          | <i>Tetrallycosa oraria</i>                                                                                   |             |                   |                                    |
| 407.          | <i>Tipulidae</i> sp.                                                                                         |             |                   |                                    |
| 408.          | <i>Trachycosmus sculptilis</i>                                                                               |             |                   |                                    |
| 409.          | <i>Urodacus novaehollandiae</i>                                                                              |             |                   |                                    |
| 410.          | <i>Veliidae</i> sp.                                                                                          |             |                   |                                    |
| 411.          | <i>Venator immansueta</i>                                                                                    |             |                   |                                    |
| 412.          | <i>Venatrix pullastra</i>                                                                                    |             |                   |                                    |
| 413.          | 34113 <i>Westralunio carteri</i> (Carter's Freshwater Mussel)                                                |             | T                 |                                    |
| <b>Mammal</b> |                                                                                                              |             |                   |                                    |
| 414.          | 24208 <i>Arctocephalus forsteri</i> (New Zealand Fur Seal, long-nosed fur-seal)                              |             | S                 |                                    |
| 415.          | 24209 <i>Arctocephalus tropicalis</i> (Subantarctic fur-seal)                                                |             | T                 |                                    |
| 416.          | 24044 <i>Balaenoptera acutorostrata</i> (Dwarf Minke Whale)                                                  |             |                   |                                    |
| 417.          | 24162 <i>Bettongia penicillata</i> subsp. <i>ogilbyi</i> (Woylie, Brush-tailed Bettong)                      |             | T                 |                                    |
| 418.          | 24251 <i>Bos taurus</i> (European Cattle)                                                                    | Y           |                   |                                    |
| 419.          | 24086 <i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)                                          |             |                   |                                    |
| 420.          | 24186 <i>Chalinolobus gouldii</i> (Gould's Wattled Bat)                                                      |             |                   |                                    |
| 421.          | 24092 <i>Dasyurus geoffroyi</i> (Chuditch, Western Quoll)                                                    |             | T                 |                                    |
| 422.          | 24043 <i>Eubalaena australis</i> (Southern Right Whale)                                                      |             | T                 |                                    |
| 423.          | 24189 <i>Falsistrellus mackenziei</i> (Western False Pipistrelle, Western Falsistrelle)                      |             | P4                |                                    |
| 424.          | 24041 <i>Felis catus</i> (Cat)                                                                               | Y           |                   |                                    |
| 425.          | 24215 <i>Hydromys chrysogaster</i> (Water-rat, Rakali)                                                       |             | P4                |                                    |
| 426.          | 48588 <i>Isodon fusciventer</i> (Quenda, southwestern brown bandicoot)                                       |             | P4                |                                    |
| 427.          | <i>Lobodon carcinophaga</i>                                                                                  |             |                   |                                    |
| 428.          | 24132 <i>Macropus fuliginosus</i> (Western Grey Kangaroo)                                                    |             |                   |                                    |
| 429.          | 24051 <i>Megaptera novaeangliae</i> (Humpback Whale)                                                         |             | S                 |                                    |
| 430.          | 24076 <i>Mesoplodon bowdoini</i> (Andrew's Beaked Whale)                                                     |             |                   |                                    |
| 431.          | 24078 <i>Mesoplodon grayi</i> (Gray's Beaked Whale)                                                          |             |                   |                                    |
| 432.          | 24081 <i>Mesoplodon mirus</i> (True's Beaked Whale)                                                          |             |                   |                                    |
| 433.          | 24213 <i>Mirounga leonina</i> (Southern Elephant Seal)                                                       |             |                   |                                    |
| 434.          | 24223 <i>Mus musculus</i> (House Mouse)                                                                      | Y           |                   |                                    |
| 435.          | 24146 <i>Myrmecobius fasciatus</i> (Numbat, Walpurti)                                                        |             | T                 |                                    |
| 436.          | 24210 <i>Neophoca cinerea</i> (Australian Sea-lion)                                                          |             | T                 |                                    |
| 437.          | 48022 <i>Notamacropus irma</i> (Western Brush Wallaby)                                                       |             | P4                |                                    |
| 438.          | 24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)                                                   |             |                   |                                    |
| 439.          | 24195 <i>Nyctophilus gouldi</i> (Gould's Long-eared Bat)                                                     |             |                   |                                    |
| 440.          | 24085 <i>Oryctolagus cuniculus</i> (Rabbit)                                                                  | Y           |                   |                                    |
| 441.          | 25508 <i>Phascogale tapoatafa</i> (Brush-tailed Phascogale)                                                  |             | S                 |                                    |
| 442.          | 48070 <i>Phascogale tapoatafa</i> subsp. <i>wambenger</i> (South-western Brush-tailed Phascogale, Wambenger) |             | S                 |                                    |
| 443.          | 24073 <i>Physeter macrocephalus</i> (Sperm Whale)                                                            |             | T                 |                                    |
| 444.          | 24166 <i>Pseudocheirus occidentalis</i> (Western Ringtail Possum, ngwayir)                                   |             | T                 |                                    |
| 445.          | 24243 <i>Rattus fuscipes</i> (Western Bush Rat)                                                              |             |                   |                                    |
| 446.          | 24245 <i>Rattus rattus</i> (Black Rat)                                                                       | Y           |                   |                                    |
| 447.          | 24145 <i>Setonix brachyurus</i> (Quokka)                                                                     |             | T                 |                                    |
| 448.          | <i>Sminthopsis murina</i>                                                                                    |             |                   |                                    |
| 449.          | 48113 <i>Stenella coeruleoalba</i> (Striped Dolphin)                                                         |             |                   |                                    |
| 450.          | 48114 <i>Stenella longirostris</i> (Spinner Dolphin)                                                         |             | P4                |                                    |
| 451.          | 24259 <i>Sus scrofa</i> (Pig)                                                                                | Y           |                   |                                    |
| 452.          | 25521 <i>Trichosurus vulpecula</i> (Common Brushtail Possum)                                                 |             |                   |                                    |

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| 453. | 24158   | <i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum) |             |                   |                                    |
| 454. | 30954   | <i>Tursiops aduncus</i> (Indo-Pacific Bottlenose Dolphin)                      |             |                   |                                    |
| 455. | 24069   | <i>Tursiops truncatus</i> (Bottlenose Dolphin)                                 |             |                   |                                    |
| 456. | 24206   | <i>Vespadelus regulus</i> (Southern Forest Bat)                                |             |                   |                                    |
| 457. | 24040   | <i>Vulpes vulpes</i> (Red Fox)                                                 | Y           |                   |                                    |

## Reptile

|      |       |                                                                  |  |    |  |
|------|-------|------------------------------------------------------------------|--|----|--|
| 458. | 42368 | <i>Acritoscincus trilineatus</i> (Western Three-lined Skink)     |  |    |  |
| 459. | 24990 | <i>Aprasia pulchella</i> (Granite Worm-lizard)                   |  |    |  |
| 460. | 24991 | <i>Aprasia repens</i> (Sand-plain Worm-lizard)                   |  |    |  |
| 461. | 25335 | <i>Caretta caretta</i> (Loggerhead Turtle)                       |  | T  |  |
| 462. | 43380 | <i>Chelodina colliei</i> (South-western Snake-necked Turtle)     |  |    |  |
| 463. | 24980 | <i>Christinus marmoratus</i> (Marbled Gecko)                     |  |    |  |
| 464. | 30893 | <i>Cryptoblepharus buechananii</i>                               |  |    |  |
| 465. | 25027 | <i>Ctenotus australis</i>                                        |  |    |  |
| 466. | 25039 | <i>Ctenotus fallens</i>                                          |  |    |  |
| 467. | 25047 | <i>Ctenotus impar</i>                                            |  |    |  |
| 468. | 25049 | <i>Ctenotus labillardieri</i>                                    |  |    |  |
| 469. | 41641 | <i>Ctenotus ora</i> (Coastal Plains Skink)                       |  | P3 |  |
| 470. | 24939 | <i>Diplodactylus polyophthalmus</i>                              |  |    |  |
| 471. | 25251 | <i>Echiopsis curta</i> (Bardick)                                 |  |    |  |
| 472. | 25096 | <i>Egernia kingii</i> (King's Skink)                             |  |    |  |
| 473. | 25100 | <i>Egernia napoleonis</i>                                        |  |    |  |
| 474. | 25250 | <i>Elapognathus coronatus</i> (Crowned Snake)                    |  |    |  |
| 475. | 30919 | <i>Hemiergis gracilipes</i> (skink)                              |  |    |  |
| 476. | 25115 | <i>Hemiergis initialis</i> subsp. <i>initialis</i>               |  |    |  |
| 477. | 25118 | <i>Hemiergis peronii</i> subsp. <i>tridactyla</i>                |  |    |  |
| 478. | 25119 | <i>Hemiergis quadrilineata</i>                                   |  |    |  |
| 479. | 44656 | <i>Hydrophis major</i> (Olive-headed seasnake, greater seasnake) |  |    |  |
| 480. | 42410 | <i>Hydrophis ornatus</i> (Ornate Reef Seasnake, Sea Snake)       |  |    |  |
| 481. | 43384 | <i>Hydrophis platurus</i> (Yellow-bellied Seasnake)              |  |    |  |
| 482. | 25131 | <i>Lerista distinguenda</i>                                      |  |    |  |
| 483. | 25133 | <i>Lerista elegans</i>                                           |  |    |  |
| 484. | 25147 | <i>Lerista lineata</i> (Perth Slider, Lined Skink)               |  | P3 |  |
| 485. | 25154 | <i>Lerista microtis</i> subsp. <i>microtis</i>                   |  |    |  |
| 486. | 25005 | <i>Lialis burtonis</i>                                           |  |    |  |
| 487. | 42413 | <i>Lissolepis luctuosa</i> (Western Swamp Skink)                 |  |    |  |
| 488. | 25184 | <i>Menetia greyii</i>                                            |  |    |  |
| 489. | 25240 | <i>Morelia spilota</i> subsp. <i>imbricata</i> (Carpet Python)   |  |    |  |
| 490. | 25191 | <i>Morethia lineocellata</i>                                     |  |    |  |
| 491. | 25192 | <i>Morethia obscura</i>                                          |  |    |  |
| 492. | 25344 | <i>Natator depressus</i> (Flatback Turtle)                       |  | T  |  |
| 493. | 25248 | <i>Neelaps bimaculatus</i> (Black-naped Snake)                   |  |    |  |
| 494. | 25252 | <i>Notechis scutatus</i> (Tiger Snake)                           |  |    |  |
| 495. | 25253 | <i>Parasuta gouldii</i>                                          |  |    |  |
| 496. | 25255 | <i>Parasuta nigriceps</i>                                        |  |    |  |
| 497. | 25510 | <i>Pogona minor</i> (Dwarf Bearded Dragon)                       |  |    |  |
| 498. | 24907 | <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)   |  |    |  |
| 499. | 25511 | <i>Pseudonaja affinis</i> (Dugite)                               |  |    |  |
| 500. | 25259 | <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)         |  |    |  |
| 501. | 25266 | <i>Simoselaps bertholdi</i> (Jan's Banded Snake)                 |  |    |  |
| 502. | 25519 | <i>Tiliqua rugosa</i>                                            |  |    |  |
| 503. | 25207 | <i>Tiliqua rugosa</i> subsp. <i>rugosa</i>                       |  |    |  |
| 504. | 24983 | <i>Underwoodisaurus milii</i> (Barking Gecko)                    |  |    |  |
| 505. | 25218 | <i>Varanus gouldii</i> (Bungarra or Sand Monitor)                |  |    |  |
| 506. | 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: 30/08/18 16:16:58

## [Summary](#)

### [Details](#)

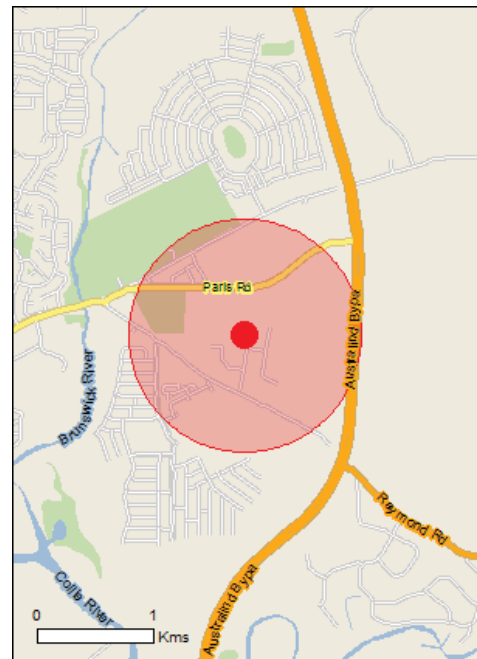
[Matters of NES](#)

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

[Extra Information](#)

### [Caveat](#)

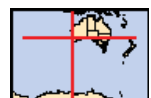
### [Acknowledgements](#)



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

Buffer: 1.0Km



# Summary

## Matters of National Environmental Significance

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

|                                                           |      |
|-----------------------------------------------------------|------|
| <a href="#">World Heritage Properties:</a>                | None |
| <a href="#">National Heritage Places:</a>                 | None |
| <a href="#">Wetlands of International Importance:</a>     | None |
| <a href="#">Great Barrier Reef Marine Park:</a>           | None |
| <a href="#">Commonwealth Marine Area:</a>                 | None |
| <a href="#">Listed Threatened Ecological Communities:</a> | 1    |
| <a href="#">Listed Threatened Species:</a>                | 20   |
| <a href="#">Listed Migratory Species:</a>                 | 11   |

## 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>             | 16   |
| <a href="#">Whales and Other Cetaceans:</a>        | None |
| <a href="#">Critical Habitats:</a>                 | None |
| <a href="#">Commonwealth Reserves Terrestrial:</a> | None |
| <a href="#">Australian Marine Parks:</a>           | None |

## Extra Information

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

|                                                  |      |
|--------------------------------------------------|------|
| <a href="#">State and Territory Reserves:</a>    | None |
| <a href="#">Regional Forest Agreements:</a>      | None |
| <a href="#">Invasive Species:</a>                | 29   |
| <a href="#">Nationally Important Wetlands:</a>   | None |
| <a href="#">Key Ecological Features (Marine)</a> | None |

# Details

## Matters of National Environmental Significance

### Listed Threatened Ecological Communities [\[ Resource Information \]](#)

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

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

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

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

#### Birds

##### [Botaurus poiciloptilus](#)

|                             |            |                                                       |
|-----------------------------|------------|-------------------------------------------------------|
| Australasian Bittern [1001] | Endangered | Species or species habitat known to occur within area |
|-----------------------------|------------|-------------------------------------------------------|

##### [Calidris canutus](#)

|                      |            |                                                  |
|----------------------|------------|--------------------------------------------------|
| Red Knot, Knot [855] | Endangered | Species or species habitat may occur within area |
|----------------------|------------|--------------------------------------------------|

##### [Calidris ferruginea](#)

|                        |                       |                                                  |
|------------------------|-----------------------|--------------------------------------------------|
| Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
|------------------------|-----------------------|--------------------------------------------------|

##### [Calyptorhynchus banksii naso](#)

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

##### [Calyptorhynchus baudinii](#)

|                                                     |            |                                      |
|-----------------------------------------------------|------------|--------------------------------------|
| Baudin's Cockatoo, Long-billed Black-Cockatoo [769] | Endangered | Breeding likely to occur within area |
|-----------------------------------------------------|------------|--------------------------------------|

##### [Calyptorhynchus latirostris](#)

|                                                         |            |                                      |
|---------------------------------------------------------|------------|--------------------------------------|
| Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523] | Endangered | Breeding likely to occur within area |
|---------------------------------------------------------|------------|--------------------------------------|

##### [Numenius madagascariensis](#)

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

##### [Pachyptila turtur subantarctica](#)

|                                |            |                                                        |
|--------------------------------|------------|--------------------------------------------------------|
| Fairy Prion (southern) [64445] | Vulnerable | Species or species habitat likely to occur within area |
|--------------------------------|------------|--------------------------------------------------------|

#### Fish

##### [Nannatherina balstoni](#)

|                               |            |                                                  |
|-------------------------------|------------|--------------------------------------------------|
| Balston's Pygmy Perch [66698] | Vulnerable | Species or species habitat may occur within area |
|-------------------------------|------------|--------------------------------------------------|

#### Mammals

##### [Dasyurus geoffroii](#)

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

##### [Pseudocheirus occidentalis](#)

|                                                |                       |                    |
|------------------------------------------------|-----------------------|--------------------|
| Western Ringtail Possum, Ngwayir, Womp, Woder, | Critically Endangered | Species or species |
|------------------------------------------------|-----------------------|--------------------|

| Name                                                                                  | Status                | Type of Presence                                       |
|---------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------|
| Ngoor, Ngoolangit [25911]                                                             |                       | habitat likely to occur within area                    |
| <b>Plants</b>                                                                         |                       |                                                        |
| <a href="#">Andersonia gracilis</a>                                                   |                       |                                                        |
| Slender Andersonia [14470]                                                            | Endangered            | Species or species habitat may occur within area       |
| <a href="#">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 may occur within area       |
| <a href="#">Drakaea elastica</a>                                                      |                       |                                                        |
| Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753] | Endangered            | Species or species habitat likely to occur within area |
| <a href="#">Drakaea micrantha</a>                                                     |                       |                                                        |
| Dwarf Hammer-orchid [56755]                                                           | Vulnerable            | Species or species habitat likely to occur within area |
| <a href="#">Eleocharis keigheryi</a>                                                  |                       |                                                        |
| Keighery's Eleocharis [64893]                                                         | Vulnerable            | Species or species habitat may occur within area       |
| <a href="#">Synaphea sp. Fairbridge Farm (D. Papenfus 696)</a>                        |                       |                                                        |
| Selena's Synaphea [82881]                                                             | Critically Endangered | Species or species habitat may occur within area       |
| <a href="#">Synaphea sp. Serpentine (G.R. Brand 103)</a>                              |                       |                                                        |
| [86879]                                                                               | Critically Endangered | Species or species habitat may occur within area       |

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

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

| Name                                                      | Threatened            | Type of Presence                                       |
|-----------------------------------------------------------|-----------------------|--------------------------------------------------------|
| <b>Migratory Marine Birds</b>                             |                       |                                                        |
| <a href="#">Apus pacificus</a>                            |                       |                                                        |
| Fork-tailed Swift [678]                                   |                       | Species or species habitat likely to occur within area |
| <a href="#">Ardenna carneipes</a>                         |                       |                                                        |
| Flesh-footed Shearwater, Fleshy-footed Shearwater [82404] |                       | 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 canutus</a>                          |                       |                                                        |
| Red Knot, Knot [855]                                      | Endangered            | Species or species habitat may occur within area       |
| <a href="#">Calidris ferruginea</a>                       |                       |                                                        |
| Curlew Sandpiper [856]                                    | Critically Endangered | Species or species                                     |

| Name                                                                                  | Threatened            | Type of Presence                                                                      |
|---------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------------|
| <a href="#">Calidris melanotos</a><br>Pectoral Sandpiper [858]                        |                       | habitat may occur within area<br><br>Species or species habitat may occur within area |
| <a href="#">Numenius madagascariensis</a><br>Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area                                      |
| <a href="#">Pandion haliaetus</a><br>Osprey [952]                                     |                       | Species or species habitat may occur within area                                      |
| <a href="#">Tringa nebularia</a><br>Common Greenshank, Greenshank [832]               |                       | Species or species habitat likely to occur within area                                |

## Other Matters Protected by the EPBC Act

| Listed Marine Species                                                                            | [ Resource Information ] |                                                        |
|--------------------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------|
| * Species is listed under a different scientific name on the EPBC Act - Threatened Species list. |                          |                                                        |
| Name                                                                                             | Threatened               | Type of Presence                                       |
| Birds                                                                                            |                          |                                                        |
| <a href="#">Actitis hypoleucos</a><br>Common Sandpiper [59309]                                   |                          | Species or species habitat may occur within area       |
| <a href="#">Apus pacificus</a><br>Fork-tailed Swift [678]                                        |                          | Species or species habitat likely to occur within area |
| <a href="#">Ardea alba</a><br>Great Egret, White Egret [59541]                                   |                          | Breeding known to occur within area                    |
| <a href="#">Ardea ibis</a><br>Cattle Egret [59542]                                               |                          | Species or species habitat may occur within area       |
| <a href="#">Calidris acuminata</a><br>Sharp-tailed Sandpiper [874]                               |                          | Species or species habitat may occur within area       |
| <a href="#">Calidris canutus</a><br>Red Knot, Knot [855]                                         | Endangered               | Species or species habitat may occur within area       |
| <a href="#">Calidris ferruginea</a><br>Curlew Sandpiper [856]                                    | Critically Endangered    | Species or species habitat may occur within area       |
| <a href="#">Calidris melanotos</a><br>Pectoral Sandpiper [858]                                   |                          | Species or species habitat may occur within area       |
| <a href="#">Haliaeetus leucogaster</a><br>White-bellied Sea-Eagle [943]                          |                          | Species or species habitat likely to occur within area |
| <a href="#">Merops ornatus</a><br>Rainbow Bee-eater [670]                                        |                          | Species or species habitat may occur within area       |
| <a href="#">Motacilla cinerea</a><br>Grey Wagtail [642]                                          |                          | Species or species                                     |

| Name                                                                                           | Threatened            | Type of Presence                                                                      |
|------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------------|
| <a href="#">Numenius madagascariensis</a><br>Eastern Curlew, Far Eastern Curlew [847]          | Critically Endangered | habitat may occur within area<br><br>Species or species habitat may occur within area |
| <a href="#">Pachyptila turtur</a><br>Fairy Prion [1066]                                        |                       | Species or species habitat likely to occur within area                                |
| <a href="#">Pandion haliaetus</a><br>Osprey [952]                                              |                       | Species or species habitat may occur within area                                      |
| <a href="#">Puffinus carneipes</a><br>Flesh-footed Shearwater, Fleshy-footed Shearwater [1043] |                       | Species or species habitat likely to occur within area                                |
| <a href="#">Tringa nebularia</a><br>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>                                                           |        |                                                        |
| Anas platyrhynchos<br>Mallard [974]                                    |        | Species or species habitat likely to occur within area |
| Columba livia<br>Rock Pigeon, Rock Dove, Domestic Pigeon [803]         |        | Species or species habitat likely to occur within area |
| Passer domesticus<br>House Sparrow [405]                               |        | Species or species habitat likely to occur within area |
| Passer montanus<br>Eurasian Tree Sparrow [406]                         |        | Species or species habitat likely to occur within area |
| Streptopelia chinensis<br>Spotted Turtle-Dove [780]                    |        | Species or species habitat likely to occur within area |
| Streptopelia senegalensis<br>Laughing Turtle-dove, Laughing Dove [781] |        | Species or species habitat likely to occur within area |

### Mammals

| Name                                                                                                                                            | Status | Type of Presence                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------------|
| Canis lupus familiaris<br>Domestic Dog [82654]                                                                                                  |        | Species or species habitat likely to occur within area |
| Felis catus<br>Cat, House Cat, Domestic Cat [19]                                                                                                |        | Species or species habitat likely to occur within area |
| Feral deer<br>Feral deer species in Australia [85733]                                                                                           |        | Species or species habitat likely to occur within area |
| Mus musculus<br>House Mouse [120]                                                                                                               |        | Species or species habitat likely to occur within area |
| Oryctolagus cuniculus<br>Rabbit, European Rabbit [128]                                                                                          |        | Species or species habitat likely to occur within area |
| Rattus rattus<br>Black Rat, Ship Rat [84]                                                                                                       |        | Species or species habitat likely to occur within area |
| Sus scrofa<br>Pig [6]                                                                                                                           |        | Species or species habitat likely to occur within area |
| Vulpes vulpes<br>Red Fox, Fox [18]                                                                                                              |        | Species or species habitat likely to occur within area |
| Plants                                                                                                                                          |        |                                                        |
| Anredera cordifolia<br>Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643] |        | Species or species habitat likely to occur within area |
| Asparagus asparagoides<br>Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]                               |        | Species or species habitat likely to occur within area |
| Asparagus declinatus<br>Bridal Veil, Bridal Veil Creeper, Pale Berry Asparagus Fern, Asparagus Fern, South African Creeper [66908]              |        | Species or species habitat likely to occur within area |
| Asparagus plumosus<br>Climbing Asparagus-fern [48993]                                                                                           |        | Species or species habitat likely to occur within area |
| Brachiaria mutica<br>Para Grass [5879]                                                                                                          |        | Species or species habitat may occur within area       |
| Cenchrus ciliaris<br>Buffel-grass, Black Buffel-grass [20213]                                                                                   |        | Species or species habitat may occur within area       |
| Chrysanthemoides monilifera<br>Bitou Bush, Boneseed [18983]                                                                                     |        | Species or species habitat may occur within area       |
| Genista linifolia<br>Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]                                                                  |        | Species or species habitat likely to occur within area |
| Genista sp. X Genista monspessulana<br>Broom [67538]                                                                                            |        | Species or species habitat may occur within area       |
| Lycium ferocissimum<br>African Boxthorn, Boxthorn [19235]                                                                                       |        | Species or species habitat likely to occur within area |

| Name                                                                                                                                                                                                                                                                | Status | Type of Presence                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------|
| Olea europaea<br>Olive, Common Olive [9160]                                                                                                                                                                                                                         |        | Species or species habitat<br>may occur within area       |
| Pinus radiata<br>Radiata Pine Monterey Pine, Insignis Pine, Wilding<br>Pine [20780]                                                                                                                                                                                 |        | Species or species habitat<br>may occur within area       |
| Rubus fruticosus aggregate<br>Blackberry, European Blackberry [68406]                                                                                                                                                                                               |        | Species or species habitat<br>likely to occur within area |
| Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii<br>Willows except Weeping Willow, Pussy Willow and<br>Sterile Pussy Willow [68497]                                                                                                                |        | Species or species habitat<br>likely to occur within area |
| Solanum elaeagnifolium<br>Silver Nightshade, Silver-leaved Nightshade, White<br>Horse Nettle, Silver-leaf Nightshade, Tomato Weed,<br>White Nightshade, Bull-nettle, Prairie-berry,<br>Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle,<br>Trompillo [12323] |        | Species or species habitat<br>likely to occur within area |

# Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

## Coordinates

-33.27629 115.74476

# 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](#)
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- [-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**

## **BLACK COCKATOO HABITAT TREE DETAILS**

Habitat Trees

DBH >50cm

Datum - GDA94

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

| Waypoint Number | Zone | mE     | mN      | Tree Species | Tree Height (m) | DBH (cm) | Number of Hollows | Estimated Entrance Size of Possible Hollow | Occupancy | Chew Marks | Potential Cockatoo Nest Hollow | Comments                                                                                           |
|-----------------|------|--------|---------|--------------|-----------------|----------|-------------------|--------------------------------------------|-----------|------------|--------------------------------|----------------------------------------------------------------------------------------------------|
| wpt007          | 50H  | 383137 | 6317645 | Jarrah       | 10-15           | >50      | 0                 |                                            | No Signs  | No Signs   | No                             |                                                                                                    |
| wpt008          | 50H  | 383138 | 6317630 | Dead Jarrah  | 15-20           | >50      | 2+                | Small, Medium & Large                      | No Signs  | No Signs   | No                             | Several large openings but branches too small                                                      |
| wpt010          | 50H  | 383129 | 6317576 | Marri        | 15-20           | >50      | 2+                | Small                                      | No Signs  | No Signs   | No                             |                                                                                                    |
| wpt011          | 50H  | 383121 | 6317507 | Jarrah       | 15-20           | >50      | 2+                | Small & Medium                             | No Signs  | No Signs   | No                             |                                                                                                    |
| wpt012          | 50H  | 383114 | 6317497 | Dead Unknown | 15-20           | >50      | 2+                | Small                                      | No Signs  | No Signs   | No                             |                                                                                                    |
| wpt014          | 50H  | 383045 | 6317085 | Jarrah       | 20+             | >50      | 0                 |                                            | No Signs  | No Signs   | No                             |                                                                                                    |
| wpt015          | 50H  | 383045 | 6317058 | Dead Jarrah  | 15-20           | >50      | 2+                | Small, Medium & Large (Cockatoo)           | Bees      | No Signs   | Yes                            | Largest hollow showed some chew marks possibly made by little corellas? In use by brushtail possum |

## DISCLAIMER

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

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

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