Fauna Assessment



South Capel

May 2018 V4

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SUMMARY

This report details the results of a fauna assessment of an area of land at Iluka Resources Limited's South Capel site (the subject site).

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. black cockatoos and western ringtail possums (WRP)) 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") and a series of field surveys (day and night) carried out in December 2017 and March 2018.

The subject site covers 88.2 ha and is highly degraded with almost all of the area having been previously cleared for various activities related to mineral sands mining. Subsequent to this clearing, the area has been subject to varying degrees of rehabilitation/revegetation. The majority of the subject site (61.7 ha, ~69.9%) is represented largely by very sparse tall shrubs (mainly *Acacia* sp.) over a very open grassland, planted non-endemic eucalypts or bare ground (including unvegetated by-product dams). A peppermint low open forest has regrown in some areas and makes up about 10.4 ha (11.8%) of the subject site. Areas of *Kunzea* tall shrubland (4.9 ha, 5.6%) and flooded gum woodland (4.7 ha, 5.3%) represent the other most common native species dominated vegetation units present. Several artificial wetlands (some seasonal) are also present within the bounds of the subject site. The various other mapped fauna habitats total only approximately 2.2 ha (2.5% of total area).

Overall fauna habitat quality is very poor as a result of the site's high degree of historical disturbance. The natural fauna habitats present only make up a small percentage of the total area and as a consequence the original biodiversity of the subject site has been significantly reduced from its original levels with only a fraction of the original fauna assemblage likely to occur in most areas. Many of the listed fauna species would only occur within the area of native vegetation that extends slightly into the subject site across its eastern boundary.

A total of 23 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the subject site during the day and night time surveys. Two introduced species were also confirmed as being present.

The black cockatoo habitat assessment identified a total of 50 trees with a Diameter and Breast Height (DBH of \geq 50 cm within the subject site. The majority (44, ~88%) of the trees were not observed to contain hollows of any size. Four (~8%) of the trees contained one or more possible hollows considered not to be suitable for black cockatoos to use for nesting purposes. Two trees (~4%) were identified as potentially containing a hollow that appeared possibly big enough to allow the entry of a black cockatoo into a suitably sized and orientated branch/trunk though no evidence of actual use by black cockatoos was seen.

Foraging evidence left by two species of black cockatoos within the subject site was observed. This foraging evidence was in the form of chewed marri fruits (attributed to the Baudin's

cockatoo) and chewed pine cones (attributed to Carnaby's cockatoo). Native plant species favoured by black cockatoos as foraging habitat (marri, jarrah and *banksia*) are largely only found in those vegetation units with a limited extent within the subject site (i.e. total area <1.4 ha). Only a small number of pine trees (<5) are also present. Given the scattered nature and limited extent of this foraging resource the overall area cannot be regarded as representing quality foraging habitat for black cockatoos because of the general absence of favoured plant species. No existing roosting trees (trees used at night by black cockatoos to rest) were positively identified during the survey.

Twenty nine WRP dreys and 20 WRPs were recorded during the day and night surveys. Based on the observations made, the majority of the subject site represents unsuitable habitat for WRPs due to either a complete lack of vegetation or low sparse vegetation in areas where revegetation/regeneration has been poor (~61.7 ha or 70.0% of the subject site). The area dominated by peppermint open forest (~10.4 ha or 11.8% of the subject site) which contains the densest midstorey component would appear to be the best quality habitat. Areas of banksia, melaleuca and kunzea (6.2 ha, 7.0% of the subject site) also appear to be favoured with the majority (18) of WRPs individuals being observed in units dominated by these species and peppermint.

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

- Baudin's cockatoo Endangered (WA)/Federal)
- Carnaby's cockatoo Endangered (WA/Federal)
- WRP Critically Endangered (WA), Vulnerable (Federal).

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

- coastal plains skink Priority 3 (WA)
- forest red-tailed black cockatoo Vulnerable (WA/Federal)
- peregrine falcon Schedule 7 (WA)
- south-western brush-tailed phascogale Schedule 6 (WA)
- quenda Priority 4 (WA)
- western brush wallaby Priority 4 (WA)
- western false pipistrelle Priority 4 (WA).

1. INTRODUCTION

This report details the result of a fauna assessment of the South Capel site. The South Capel site (subject site) is located south of the Capel town site. To remediate the South Capel site, patchy regrowth vegetation will be disturbed within an (approximately) 88.2 ha footprint. The majority of the vegetation present generally displays insufficient structure to be attributed to native vegetation communities, with most being classified as degraded to completely degraded (Endemic 2013).

This fauna assessment represents one of several technical reports that will be used to provide an understanding of the suite of environmental values present within the subject site to assist with further planning.

2. SCOPE OF WORKS

The scope of works was to conduct a Level 1 fauna survey as defined by the Environmental Protection Authority (EPA 2016). Because the general area is known to be utilised by black cockatoos and western ringtail possums (WRPs) the scope of the survey work was expanded to include a baseline assessment of the sites significance to these species as well. The fauna assessment has therefore included:

- 1. Level 1 fauna assessment (in accordance with EPA (2016) guidelines);
- 2. Targeted searches for black cockatoo habitat/site use (habitat trees, existing and potential nest hollows, foraging and roosting habitat);
- 3. Targeted day and night searches for WRP habitat/site use (foraging, refuge and dispersal habitat and individuals); and
- 4. Report summarising results, methods.

Note: For the purposes of this report the term black cockatoo is in reference to Baudin's Cockatoo (*Calyptorhynchus baudinii*), Carnaby's Cockatoo (*Calyptorhynchus latirostris*) and the Forest Redtailed Black Cockatoo (*Calyptorhynchus banksii naso*).

3. METHODS

3.1 POTENTIAL FAUNA INVENTORY - LITERATURE REVIEW

3.1.1 Database Searches

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

- Department of Biodiversity, Conservation and Attractions' (DBCA) NatureMap database search (combined data from DBCA, WAM, BA, ALA and consultant's reports) (DBCA 2018b); and
- Department of Environment and Energy's (DotEE) Protected matters search tool (DotEE 2018b).

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

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

3.1.2 Previous Fauna Surveys in the Area

Fauna surveys, assessments and reviews have been undertaken in nearby areas in the past. The most significant of the publicly available surveys have been used as the primary reference material for compiling the potential fauna assemblage for the general area.

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

- Bamford, M.J and A.R. (2000). Proposed Gwindinup Mineral Sands Mine. Fauna Surveys; August and December 1999. Unpublished report for Cable Sands WA. January 2000.
- Bamford, M.J and A.R (2001). Fauna Survey of the Ludlow Mining Lease. Final Report. Unpublished report for Cable Sands (WA) Pty Ltd. November 2001.

- Bancroft, W. and Bamford, M. (2008). Fauna values of Bemax's Happy Valley mineral sands deposit. Unpublished report for Bemax Resources Limited. January 2008.
- Biologic (2014). Wonnerup North Vertebrate Fauna Assessment. Unpublished report for Cristal Mining Australia Ltd.
- Biota (2007a). Yoganup 215 Strand Fauna and Faunal Assemblage Survey. Unpublished report for Iluka Resources. February 2007.
- Biota (2007b). Tutunup South Fauna Habitat and Fauna Assemblage Seasonal Survey. Unpublished report for Iluka Resources. December 2007.
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 Unpublished report for Iluka Resources. March 2009.
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- Harewood, G. (2012). Phase 1 and 2 Seasonal Fauna Surveys (Level 2).
 Yoongarillup Mineral Sands Project. Unpublished report for Doral Mineral Sands Pty Ltd.
- Harewood, G. (2013). Fauna Assessment of Yoganup Extended. Unpublished report for Iluka Resources Ltd.
- Harewood, G (2017). Fauna Assessment Lot 3833 (Part), Hyder Road.
 Unpublished report for Iluka Resources Limited. February 2017.
- Hart, Simpson and Assoc. (1997). Wonnerup -Tutunup Road Vertebrate Fauna.
 Unpublished report for Westralian Sands Ltd.
- Mattiske Consulting Pty Ltd & Bamford M.J. and A.R. (1998). Flora, Vegetation and Vertebrate Fauna - South Capel Area. Unpublished report for RGC Mineral Sands Ltd.
- Ninox (2006). A Vertebrate Fauna Assessment of the Yoganup Mineral Sands Project Area. Unpublished report for Iluka Resources. March 2006.

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

3.1.3 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 DotEE;
- Wildlife Conservation Act 1950 (WC Act). Administered by the Western Australian DBCA. It should be noted that the WC Act is soon to be repealed and replaced by the Biodiversity Conservation Act 2016.
- Wildlife Conservation (Specially Protected Fauna) Notice 2017 (Government of Western Australia 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
- 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)¹;
- 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).

All migratory bird species listed in the annexes to these bilateral agreements are protected in Australia as matters of national environmental significance (MNES) under the EPBC Act.

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

¹ Note – Some species listed under JAMBA are also protected under Schedule 5 of the WC Act.

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, 2000a and 2000b). 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 was 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.

3.1.4 Invertebrate Fauna of Conservation Significance

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

3.1.5 Likelihood of Occurrence – Fauna of Conservation Significance

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

- Would Not Occur: There is no suitable habitat for the species in the subject site and/or there is no documented record of the species in the general area since records have been kept and/or the species is generally accepted as being locally/regionally extinct (supported by a lack of recent records).
 - Locally Extinct: Populations no longer occur within a small part of the species natural range, in this case within 10 or 20 km of the subject site.
 Populations do however persist outside of this area.

- Regionally Extinct: Populations no longer occur in a large part of the species natural range, in this case within the southern forest regions.
 Populations do however persist outside of this area.
- Unlikely to Occur: The subject site is outside of the currently documented distribution for the species in question, or no suitable habitat (type, quality and extent) was identified as being present during the field assessment. Individuals of some species may occur occasionally as vagrants/transients especially if suitable habitat is located nearby but the subject site itself would not support a population or part population of the species.
- Possibly Occurs: The subject site is within the known distribution of the species in
 question and habitat of at least marginal quality was identified as being present
 during the field assessment, supported in some cases by recent records being
 documented in literature from within or near the subject site. In some cases, while
 a species may be classified as possibly occurring, 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.

3.1.6 Taxonomy and Nomenclature

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

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

3.2 SITE SURVEYS

The first phase of the assessment of the subject site involved a day time field survey on 1 December 2017 and a nocturnal survey on 4 December 2017. The second phase of day and night time survey work over some additional areas added subsequent to the first round of surveys was carried out on 8 and 9 March 2018, respectively. All survey work was done by Greg Harewood (Zoologist).

Weather conditions at the time of the surveys in December 2017 were mild with temperatures ranging from about 7°C to 24°C. Some light drizzle was experienced on the morning of 4 December 2017. Weather conditions in March 2018 were warmer with temperatures ranging from 16°C up to about 26°C.

3.2.1 Fauna Habitat Assessment

Vegetation units, landforms and soils observed during the field reconnaissance survey have been used to define broad fauna habitat types across the subject site. This information has been supplemented with observations made during a flora and vegetation survey carried out by Endemic (2013).

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

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

3.2.2 Opportunistic Fauna Observations

Opportunistic observations of fauna species were made during all field survey work which primarily involved a series of transects across 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.

Evidence of the presence or likely presence of fauna species of conservation significance (including suitable habitat) was searched for and recorded concurrent with this aspect of the survey work. The aim was to obtain sufficient information to make a definitive comment on the likely significance of the subject site to species of conservation significance which may be present which were not the subject to targeted assessments.

3.2.3 Black Cockatoo Habitat Assessment

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

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

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

- breeding habitat;
- foraging habitat; and
- night roosting habitat.

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

3.2.3.1 Black Cockatoo Breeding Habitat

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

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

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

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

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

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

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

For the purposes of this study a tree containing a potential cockatoo nest hollow was defined as generally, any tree which is alive or dead that contains one or more visible hollows (cavities within the trunk or branches) suitable for occupation by black cockatoos for the purpose of nesting/breeding. Hollows that had an entrance greater than about 10cm in diameter and would allow the entry of a black cockatoo into a suitably orientated and sized branch/trunk, was recorded as a "potential nest hollow".

Identified hollows were examined using binoculars for evidence of actual use by black cockatoos (e.g. chewing around hollow entrance, scarring and scratch marks on trunks and branches).

3.2.3.2 Black Cockatoo Foraging Habitat

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

3.2.3.3 Black Cockatoo Roosting Habitat

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

3.2.4 Western Ringtail Possum Assessment

3.2.4.1 Daytime Survey

Two day time surveys to locate and record dreys, obvious tree hollows, scats and individual WRPs was carried out concurrent with the black cockatoo habitat assessment and involved a series of close spaced traverses on foot across the subject site.

3.2.4.2 Night Time Survey

Two night time surveys to locate and record individual WRPs was carried out and involved a series traverses across the subject site, on foot using a LED head torch.

3.2.4.3 Habitat Assessment

Description and comments on the amount and quality of WRP habitat within the subject site are provided based on observations made during the site surveys.

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 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 m, 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.

With respect to native vertebrate fauna, 17 mammals (includes nine bat species), 107 bird, 23 reptile and nine frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the subject area at times. Nine species of introduced animals could also frequent the area.

Of the 156 native animals that are listed as potentially occurring in the area, six are considered to be endangered/vulnerable or in need of special protection under State and/or Federal law. Four DBCA priority species have also been listed as potentially present (Table 1).

Table 1: Potential Vertebrate Fauna of Conservation Significance using the Subject Site.

Species	Conservation Status		
Species	WC Act/ DBCA Priority	EPBC Act	
Coastal Plains Skink Ctenotus ora	P3	-	
Peregrine Falcon Falco peregrinus	S7	-	
Carnaby`s Cockatoo Calyptorhynchus latirostris	S2	EN	
Baudin's Cockatoo Calyptorhynchus baudinii	S2	EN	
Forest Red-tailed Black Cockatoo Calyptorhynchus banksii naso	S3	VU	
South-western Brush-tailed Phascogale Phascogale tapoatafa wambenger	S6	-	
Quenda Isoodon fusciventer	P4	-	
Western Ringtail Possum Pseudocheirus occidentalis	S1	VU	
Western Brush Wallaby Macropus irma	P4	-	
Western False Pipistrelle Falsistrellus mackenziei	P4	-	

See Appendix A for conservation status codes

5.2 SITE SURVEYS

5.2.1 Fauna Habitat Assessment

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

"Low lying coastal plain mainly covered with Woodlands. It is dominated by Banksia or Tuart on sandy soils, Allocasuarina obesa on outwash plains, and paperbark in swampy areas. In the east, the plain rises to duricrusted Mesozoic sediments dominated by Jarrah Woodland. Warm Mediterranean. Three phases of marine sand dune development provide relief. The outwash plains, once dominated by A. obesa – Marri Woodlands and Melaleuca shrublands, are extensive only in the south." (Thackway and Cresswell, 1995).

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

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

The subject site itself is highly degraded with almost all of the area having been previously cleared for various activities related to mineral sands mining. Subsequent to this clearing the area has been subject to varying degrees of rehabilitation/revegetation. The majority of the area is therefore now represented by vegetation that has either been planted or that has regrown naturally with the density of plant growth varying considerably from area to area.

Descriptions and example images of the main fauna habitats/dominant vegetation (i.e. those with an extent of greater than 1 ha) present within the subject site are provided in Table 2. The location and extent of the five main identified habitat/vegetation units is shown in Figure 3.

Table 2: Main Fauna Habitats within the Subject Site

Fauna Habitat Description	Example Image
Rehabilitated - planted non- endemic trees, scattered shrubs and native regrowth or bare ground (including by-product dams). Total Area = ~61.7 ha (70.0%)	

Fauna Habitat Description	Example Image
Regrowth - Peppermint low open forest with scattered Jarrah, <i>Melaleuca</i> and <i>Kunzea</i> tall shrubland. Total Area = ~10.4 ha (11.8%)	
Regrowth - <i>Kunzea</i> tall open scrub over shrubland. Some areas with <i>Acacia</i> and/or Peppermint. Total Area = ~4.9 ha (5.6%)	
Regrowth/Planted – Flooded Gum Woodland. Some areas with planted non-endemic trees and/or scattered <i>Acacia</i> and/or Peppermint. Total Area = ~4.7 ha (5.3%)	

Fauna Habitat Description	Example Image
Regrowth – Artificial Wetlands (with scattered Typha and/or sedges). Total Area = ~4.3 ha (4.9%)	

The majority of the subject site (61.7 ha, \sim 69.9%) is represented largely by very sparse tall shrubs (mainly *Acacia* sp.) over a very open grassland, planted non-endemic eucalypts or bare ground (including unvegetated by-product dams). A peppermint low open forest has regrown in some areas and makes up about 10.4 ha (11.8 %) of the subject site. Areas of *Kunzea* tall shrubland (4.9 ha, 5.6%) and flooded gum woodland (4.7 ha, 5.3%) represent the other most common native species dominated vegetation units present. Several artificial wetlands (some seasonal) are also present within the bounds of the subject site. The various other mapped fauna habitats total only approximately 2.2 ha (2.5% of total area).

Overall fauna habitat quality is very poor as a result of the site's high degree of historical disturbance. The natural fauna habitats present only make up a small percentage of the total area and as a consequence the original biodiversity of the subject site has been significantly reduced from its original levels with only a fraction of the original fauna assemblage likely to occur in most areas. Many of the listed fauna species would only occur within the area of native vegetation that extends slightly across the eastern boundary of the subject site (see Figure 1 and 2). This vegetation extends well to the east and includes the Capel Nature Reserve.

5.2.2 Opportunistic Fauna Observations

Opportunistic fauna observations are listed in Appendix B. A total of 23 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the subject site during the day and night time surveys. Two introduced species were also confirmed as being present. Besides the two species of black cockatoo and the WRP, no other fauna species of conservation significance were recorded.

The species recorded were:

- Western Banjo Frog Limnodynastes dorsalis
- Pacific Black Duck Anas superciliosa
- Black-fronted Dotterel Charadrius melanops
- Common Bronzewing Phaps chalcoptera
- Splendid Fairy-wren Malurus splendens
- White-breasted Robin Eopsaltria georgiana
- Emu Dromaius novaehollandiae
- Laughing Kookaburra Dacelo novaeguineae (Introduced)
- Rainbow Bee-eater Merops ornatus
- Australian Magpie Cracticus tibicen
- Australian Raven Corvus coronoides
- Baudin's Cockatoo Calyptorhynchus baudinii (Endangered (WA/Federal))
- Carnaby's Cockatoo Calyptorhynchus latirostris (Endangered (WA/Federal))
- Red-capped Parrot Platycercus spurius
- Australian Ringneck Platycercus zonarius
- Western Gerygone Gerygone fusca
- Grey Fantail Rhipidura fuliginosa
- Broad-tailed Thornbill Acanthiza apicalis
- Silvereye Zosterops lateralis
- Rufous Whistler Pachycephala rufiventris
- Black-faced Cuckoo-shrike Coracina novaehollandiae
- Western Grey Kangaroo Macropus fuliginosus
- Western Ringtail Possum Pseudocheirus occidentalis (Critically Endangered (WA), Vulnerable (Federal))

- Common Brushtail Possum Trichosurus vulpecula
- Rabbit *Oryctolagus cuniculus* (Introduced)

5.2.3 Black Cockatoo Habitat Assessment

5.2.3.1 Black Cockatoo Breeding Habitat

Trees considered potentially suitable for black cockatoos to use as nesting habitat (using DotEE criteria i.e. DBH \geq 50 cm (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:

- Marri Corymbia calophylla;
- Flooded Gum Eucalyptus rudis;
- Unidentified non-endemic eucalypts (planted); and
- Dead unidentifiable species.

A summary of the potential black cockatoo habitat trees observed within the subject site is provided in Table 3 below and their location shown in Figure 4.

Table 3: Summary of Potential Black Cockatoo Habitat Trees (DBH ≥50 cm) within the Subject Site

Tree Species	Total Number of Habitat Trees Recorded	Number of Trees with <u>No Hollows</u> Observed	Number of Trees with Hollows Considered Unsuitable for Nesting Black Cockatoos	Number of Trees with Hollows Considered Possibly Suitable for Nesting Black Cockatoos
Marri	2	2	0	0
Flooded Gum	30	28	2	0
Non-endemic Eucalypt	14	14	0	0
Dead Unidentifiable	4	0	2	2
TOTAL	50	44	4	2

The assessment identified a total of 50 trees with a DBH of \geq 50 cm within the subject site. The majority (44, ~88%) of the trees were not observed to contain hollows of any size. Four (4, ~8%) of the trees contained one or more possible hollows considered by the Author not to be suitable for black cockatoos to use for nesting purposes. Two trees (2, ~4%) were identified as potentially containing a hollow that appeared possibly big enough to allow the entry of a black cockatoo into a suitably sized and orientated branch/trunk though no evidence of actual use by black cockatoos was seen.

The 14 unidentified non-endemic eucalypt trees were represented by at least two, presumed eastern states, species. It is not known if these tree species have the propensity to develop hollows suitable for black cockatoos.

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

The subject site falls within the mapped breeding range of Carnaby's cockatoo as depicted in the most current recovery plan produced by DBCA (see Figure 2 - DPaW 2013). Bamford (2004) reports a breeding attempt by Carnaby's cockatoo in the Ludlow Tuart Forest in 2003 at a point about 2.5 km south west of the subject site (Figure 5). A review of other available data revealed several breeding records in Dalyellup and at Hithergreen for Carnaby's Cockatoo but no others from the vicinity of the subject site (i.e. within 12 km).

The DBCA recovery plan for Baudin's cockatoo and the forest red-tailed black cockatoo (DEC 2008) does not specifically define any known breeding areas for either species. Johnstone and Kirkby (2011) also do not specifically mention breeding areas of either species within the area though both are noted as utilising marri trees (and other tree species) for breeding in the south west.

While there appears to be a paucity of breeding data for the general area this could simply be a consequence of a lack of survey work or a lack of publicly available data. Based on available vegetation mapping it is however estimated that there is approximately 7,920 ha of native vegetation within 12 km the subject site (Figure 5). A significant portion of this vegetation is located within the Tuart Forest National Park (total area 3,030 ha) most of which falls within 12km of the subject site. Given these facts, there is significant potential for breeding to take place in the wider area (assuming the presence of suitable trees).

The results therefore suggest that the removal of some or all of the identified "habitat trees" from within the subject site is unlikely to have significant direct or indirect impact on breeding black cockatoos and is also unlikely to significantly impact on the total "breeding habitat" resource available in the wider area.

5.2.3.2 Black Cockatoo Foraging Habitat

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

- Marri Corymbia calophylla;
- Flooded Gum Eucalyptus rudis;
- Jarrah Eucalyptus marginata;
- Banksia sp;
- Pine Pinus radiata; and
- Bottlebrush Callistemon sp. (planted).

It should be noted that flooded gum and bottlebrush, while species documented as being fed upon by black cockatoos of at least one species, would not represent a significant proportion of any one birds diet as these plant species are a high effort, low yield food source. The other native tree species listed (marri, jarrah and *banksia*) are largely only found in those vegetation units with a limited extent within the subject site (i.e. total area <1.4 ha). Only a small number of pine trees (<5) are also present.

Foraging evidence left by two species of black cockatoos within the subject site was observed. This foraging evidence was in the form of chewed marri fruits (attributed to the Baudin's cockatoo) and chewed pine cones (attributed to Carnaby's cockatoo).

As indicated, marri, jarrah and banksia trees are largely contained with units making up only a small percentage of the subject site (<1.4 ha, 1.6%) and overall the area cannot be regarded as representing quality foraging habitat for black cockatoos because of this general absence of favoured foraging species.

Based on available vegetation mapping it is estimated that there is approximately 7,920 ha of native vegetation within 12 km of the subject site (~16.4% of total area, though it should be noted that a high proportion of the total area within 12 km of the subject site is ocean), much of which is very likely to represent potential black cockatoo foraging habitat of some type. A significant portion of this vegetation is located within the Tuart Forest National Park (total area 3,030 ha). There is also up to 500 ha of pine plantations within 12 km of the subject site. Pines are likely to be a significant foraging resource for Carnaby's cockatoos (and possibly Baudin's cockatoo) in this area.

It is difficult to calculate the actual extent of natural foraging habitat within the subject site given it is largely comprised of patchy fragmented vegetation, but it is unlikely to total more than about 1.4 ha (i.e. areas contain marri, jarrah or *banksia*). This area represents

less than 0.017% of the potential foraging habitat (including pines) within 12 km of the subject site.

The results therefore suggest that the potential removal of some or all of the vegetation from the subject site is unlikely to have a significant impact on the availability of foraging resources for black cockatoos in the general area.

5.2.3.3 Black Cockatoo Roosting Habitat

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

A review of available data revealed a single documented roost site about 4.5 km south west of the subject site in or near the Ludlow Tuart Forest (Johnstone and Kirkby 2011). They also show other roost sites further south near Busselton and Tutunup (Figure 5).

While there appears to be a paucity of documented roosting sites for the general area this could simply be a consequence of a lack of survey work or a lack of publicly available data. Based on available vegetation mapping it is however estimated that there is approximately 7,920 ha of native vegetation within 12 km the subject site (Figure 5). A significant portion of this vegetation is located within the Tuart Forest National Park (total area 3,030 ha), most of which falls within 12km of the subject site. Given these facts, there is significant potential for roosting to take place in the wider area (assuming the presence of suitable trees).

The results suggest that the removal of the relatively small number of trees from the subject site will not have any direct impact on roosting black cockatoos and also will not significantly impact on roosting opportunities available in the area.

5.2.4 Western Ringtail Possum Assessment

5.2.4.1 Daytime Survey

Twenty nine WRP dreys were observed during the day surveys (Figure 6). It should be noted that forks in trees, subtle cavities in tree trunks, fallen hollow logs, rabbit burrows and dense ground cover (e.g. swordgrass/sedges) are also use by WRPs for daytime refuge and therefore observations of dreys only provide a guide to WRP habitat use/quality as other opportunities for daytime refuge may exist. WRP also build and use a number of dreys within their home range. Dreys also maybe abandoned but remain insitu for long periods of time even when not used or maintained. Because of these facts the number of dreys observed should not be used to determine current areas of occupancy/species abundance.

WRP scats were also observed at several locations. In most areas dense groundcover made searching for scats difficult and time consuming and therefore this method for determining WRP presence was not employed extensively.

5.2.4.2 Night Time Survey

The nocturnal survey observations are shown in Figure 6. Eight WRPs were recorded within a section of the subject site during the first nocturnal survey. Twelve WRPs and four common brushtail possums were recorded within a section of the subject site during the second nocturnal survey. It should be noted that different areas were examined during each nocturnal count with only a small area of overlap (i.e. vegetation along the south eastern boundary. It is however considered unlikely that any animals recorded in this specific area on the second night survey were the same individuals seen during the first survey given the distance between observations. Combining the results from both night surveys suggests that the subject site is currently being utilised by at least 20 WRPs.

5.2.4.3 Habitat Assessment

Based on the observations made, the majority of the subject site represents unsuitable habitat for WRPs due to either a complete lack of vegetation or low sparse vegetation in areas where revegetation/regeneration has been poor (~61.7 ha or 70.0% of the subject site). The area dominated by peppermint open forest (~10.4 ha or 11.8% of the subject site) which contains the densest midstorey component would appear to be the best quality habitat. Areas of *banksia*, *melaleuca* and *kunzea* (6.2 ha or 7.0% of the subject site) also appear to be favoured with the majority (18) of WRPs individuals being observed in units dominated by these species and peppermint.

Based on available vegetation mapping it is estimated that there is approximately 7,920 ha of native vegetation within 12 km the subject site (Figure 5). A significant portion of this vegetation is located within the Tuart Forest National Park (total area 3,030 ha), most of which falls within 12 km of the subject site. While this vegetation has not been specifically assessed for its suitability as WRP habitat a high percentage is very likely to be suitable for WRPs. The Author's own database of WRP records made within the last 15 years from within 12 km of the subject site contains 411 individual observations which supports this conclusion (Note: NatureMap (2018) also shows a small number of additional observations made by others in this area).

These details suggest that the removal of some habitat from the subject site which appears to be currently in use by a relatively small number of WRPs is not likely to substantially impact on the species overall status in the wider area.

5.3 FAUNA INVENTORY – SUMMARY

5.3.1 Vertebrate Fauna

Table 4 summarises the number of vertebrate fauna species potentially occurring within or utilising at times the subject site, based on results from the literature review and observations made during the field assessment. A complete list of vertebrate fauna possibly inhabiting or frequenting the subject site is located in Appendix B.

Table 4: Summary of Potential Vertebrate Fauna Species (as listed in Appendix B)

Group	Total number of Potential species	Potential number of Specially Protected species	Potential number of Migratory species	Potential number of Priority species	Number of species <u>recorded</u> during field survey
Amphibians	9	0	0	0	1
Reptiles	23	0	0	1	0
Birds	110 (3)	4	0	0	20 (1)
Non-Volant Mammals	14 (6)	2	0	2	4 (1)
Volant Mammals (Bats)	9	0	0	1	0
Total	165 (9)	6	0	4	25 (2)

Brackets = number of introduced species included in total.

As previously discussed, despite the omission of some species it should be noted that the list provided is still very likely an over estimation of the fauna species utilising the subject site (either on a regular or infrequent basis) as a result of the precautionary approach adopted for the assessment. At any one time only a subset of the listed potential species are likely to be present within the bounds of the subject site.

5.3.2 Vertebrate Fauna of Conservation Significance

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

Baudin's cockatoo *Calyptorhynchus baudinii* – Endangered (WC Act/EPBC Act)
A small amount of foraging evidence attributed to this species was observed during the survey period (i.e. a few chewed marri fruits). A small amount of the remnant vegetation within the subject site represents quality foraging habitat (i.e. <1.4 ha of woodlands/low woodland containing marri, jarrah and/or banksia). Fifty larger trees (≥50 cm DBH) can be considered potential breeding habitat. Fourteen of these trees appeared to be non-endemic eucalypt trees represented by at least two, presumed eastern states, species. It is not known if these tree species have the propensity to develop hollows suitable for black cockatoos. Two dead trees were identified as potentially containing hollows that appeared possibly big enough to allow the entry of a black cockatoo into a suitably sized and orientated branch/trunk though no evidence of actual use by black cockatoos was seen. Trees within the subject site do not appear to be used for roosting.

- Carnaby's cockatoo Calyptorhynchus latirostris Endangered (WC Act/EPBC Act) A small amount of foraging evidence attributed to this species was observed during the survey period (i.e. a few chewed pine cones). A small amount of the remnant vegetation within the subject site represents quality foraging habitat (i.e. <1.4 ha of woodlands/low woodland containing marri, jarrah and/or banksia). Fifty larger trees (>50 cm DBH) can be considered potential breeding habitat. Fourteen of these trees appeared to be non-endemic eucalypt trees represented by at least two, presumed eastern states, species. It is not known if these tree species have the propensity to develop hollows suitable for black cockatoos. Two dead trees were identified as potentially containing hollows that appeared possibly big enough to allow the entry of a black cockatoo into a suitably sized and orientated branch/trunk though no evidence of actual use by black cockatoos was seen. Trees within the subject site do not appear to be used for roosting.
- WRP Pseudocheirus occidentalis Critically Endangered (WC Act), Vulnerable (EPBC Act)
 The results of the WRP assessment indicate that this species is utilising vegetation within the subject site as habitat. Individuals appear to be favouring areas containing reasonably dense midstorey vegetation.

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 was found at the time of the field survey, the status of some in the area remains uncertain.

These species are:

- Coastal plains skink Ctenotus ora Priority 3 (DBCA Priority Species)
 Status of this species within the subject site is difficult to determine without a detailed survey, however, given the location of the subject site within its documented range, recent nearby records and the presence of a small amount of habitat that appears suitable it must be assumed to be present. Listed as a potential species based on available information.
- Forest red-tailed black cockatoo Calyptorhynchus banksii naso Vulnerable (WC Act/EPBC Act)
 - No evidence of this species using the subject site was observed but it is known to frequent the general area and so may occur at least occasionally. A small amount of the remnant vegetation within the subject site represents quality foraging habitat (i.e. <1.4 ha of woodlands/low woodland containing marri and jarrah). Fifty larger trees (\geq 50 cm DBH) can be considered potential breeding habitat. Fourteen of these trees appeared to be non-endemic eucalypt trees represented by at least two, presumed eastern states, species. It is not known if these tree species have the propensity to develop hollows suitable for black cockatoos. Two dead trees were identified as potentially containing hollows that appeared possibly big enough to allow the entry of a black cockatoo into a suitably sized and orientated

branch/trunk though no evidence of actual use by black cockatoos was seen. Trees within the subject site do not appear to be used for roosting. Listed as a potential species based on available information.

- Peregrine falcon Falco peregrinus Schedule 7 (WC Act)
 This species potentially utilises some sections of the subject site as part of a much larger home range though it is only likely to occur very infrequently. Listed as a potential species based on available information.
- South-western brush-tailed phascogale Phascogale tapoatafa wambenger Schedule 6 (WC Act)
 Recorded during previous surveys in the general area (e.g. Biologic 2014, Harewood 2008) though most of the habitats present appear unsuitable or marginal. Listed as a potential species based on available information.
- Quenda Isoodon fusciventer Priority 4 (DBCA Priority Species)
 No conclusive evidence of this species being present was found during the site survey, but it may occur where ever dense ground cover exists particularly in areas of natural bushland along the eastern boundary. Listed as a potential species based on available information.
- Western brush wallaby Macropus irma Priority 4 (DBCA Priority Species)
 This species is likely to occur in the larger bush remnants that make up the South Capel area including the Capel Nature Reserve and therefore may at times frequent the subject site though most of the area appears unsuitable. Listed as a potential species based on available information.
- Western false pipistrelle Falsistrellus mackenziei Priority 4 (DBCA Priority Species)
 There is a lack of records of this species in the immediate vicinity but given habitat appears at least marginally suitable it must be assumed to occur, if only occasionally while foraging. Listed as a potential species based on available information.

As listed in Table 5 below, a number of other species of conservation significance, while possibly present in the wider area are not considered as potential species due to known localised extinction (and no subsequent recruitment from adjoining areas), lack of suitable habitat and/or the presence of feral predators.

Thirty five species that potentially frequent or occur in the subject site are noted as Bush Forever Decreaser Species in the Perth Metropolitan Region (seven 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 because of disturbance and land clearing (Dell and Hyder-Griffiths 2002). The continued persistence of these species in other areas outside of the Perth area is therefore of significance.

5.3.3 Invertebrate Fauna of Conservation Significance

One conservation significant invertebrate species appeared in the DBCA database search (DBCA 2017), this being Carter's freshwater mussel (*Westralunio carteri*). This species would not occur in the subject site due to a complete lack of suitable habitat.

6. LIKELIHOOD OF OCCURRENCE AND POTENTIAL IMPACTS

Fauna of conservation significance identified during the literature review as previously being recorded in the general area are listed in Table 5. Each has been assessed and ranked for their likelihood of occurrence within the subject site itself based on information obtained during the fauna assessment.

The exact location and extent of native vegetation clearing within the subject site that may be undertaken has yet to be finalised and therefore it is difficult to quantify impacts. The potential direct and indirect impact on fauna that may occur as a consequence of clearing will be dependent on each fauna species habits, population density and the quantity and quality of potential habitat that will be affected.

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, foxes);
- Death or injury of fauna during clearing and construction; and
- An increase in fauna road kills subsequent to development.

In this instance impacts are most likely to be related to the loss of small areas of habitat and the potential for some species to be killed or injured during clearing. Based on the maximum extent of clearing likely and the quality of habitats present, likely impacts on species of conservation significance previously recorded in the general area has been assessed, a summary of which is provided in Table 5 below.

Table 5: Likelihood of Occurrence and Potential Impacts – Fauna Species of Conservation Significance

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Potential Impacts
	WC Act/ DBCA Priority	EPBC Act				
Carter's Freshwater Mussel Westralunio carteri	P1	-	Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots.	No	Would Not Occur.	No impact.
Pouched Lamprey Geotria australis	P1	-	This species lives in mud burrows in the upper reaches of coastal streams for the first four years of life until migrating to the sea. Adults migrate up to 60km upstream during spawning.	No	Would Not Occur.	No impact.
Balston's Pygmy Perch Nannatherina balstoni	\$3	VU	Acidic, tannin stained freshwater pools, streams and lakes within 30km of the coast, typically situated amongst peat flats. Prefers shallow water and is commonly found in association with tall sedge thickets.	No	Would Not Occur. Outside of documented distribution	No impact.
Perth Lined Lerista Lerista lineata	P3	-	This small species of skink inhabits white sands under areas of shrubs and heath where it inhabits loose soil and leaf litter particularly in association with banksias.	No	Would Not Occur. Outside of documented distribution	No impact.
Coastal Plains Skink Ctenotus ora	P3	-	Sandy substrates with low vegetation (including heath) in open <i>Eucalyptus/Corymbia</i> woodland over <i>Banksia</i> .	Yes	Possibly Occurs	Loss/modification of a small area of habitat and therefore likely low level of impact to population.
Malleefowl Leipoa ocellata	S3	VU	Mainly scrubs and thickets of mallee <i>Eucalyptus</i> spp., boree <i>Melaleuca lanceolata</i> and bowgada <i>Acacia linophylla</i> , also dense litter forming shrublands.	No	Would Not Occur. Regionally extinct.	No impact.
Blue-billed Duck Oxyura australis	P4	-	Well vegetated freshwater swamps, large dams and lakes, winters on more open water. Occasionally salt lakes and estuaries freshened by floodwaters.	No/Marginal	Unlikely to Occur. Wetland area too small/shallow.	No impact anticipated.
Glossy Ibis Plegadis falcinellus	S5	Mig	Well vegetated wetlands, wet pastures, rice fields, floodwaters, floodplains, brackish or occasionally saline wetlands, mangroves, mudflats, occasionally dry grasslands.	No/Marginal	Unlikely to Occur. Very uncommon in SW, may occur very occasionally.	No impact anticipated.
Hooded Plover Charadrius rubricollis	P4	Ма	Broad sandy ocean beaches and bays, coastal and inland salt lakes.	No	Would Not Occur.	No impact.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Potential Impacts
	WC Act/ DBCA Priority	EPBC Act				
Migratory Shorebirds/Wetland Species/Marine Species (various reptiles, birds and mammals)	S5, Various	Ma, Mig, Various	Varies between species but includes open ocean, beaches and permanent/temporary wetlands varying from billabongs, swamps, lakes, floodplains, sewerage farms, saltwork ponds, estuaries, lagoons, mudflats sandbars, pastures, airfields, sports fields and lawns.	No/Marginal for some species	Would Not Occur/Unlikely to Occur.	No impact anticipated.
Eastern Osprey Pandion haliaetus	S 5	Ma, Mig	Coasts, estuaries, bays, inlets, islands, and surrounding waters, coral atolls, reefs, lagoons, rock cliffs and stacks. Ascends larger rivers.	No	Would Not Occur.	No impact.
Peregrine Falcon Falco peregrinus	S7	-	Diverse from rainforest to arid shrublands, from coastal heath to alpine Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes.	Yes	Possibly Occurs.	Loss/modification of a small area of foraging habitat and therefore likely low level of impact to population
Masked Owl (SW population) Tyto n. novaehollandiae	P3	-	Roosts and nests in heavy forest, hunts over open woodlands and farmlands.	No/Marginal	Unlikely to Occur but may occur very occasionally.	No impact anticipated.
Australasian Bittern Botaurus poiciloptilus	S1	EN	Freshwater wetlands, occasionally estuarine; prefers heavy vegetation such as beds of tall dense <i>Typha</i> , <i>Baumea</i> and sedges in freshwater swamps.	No/Marginal	Unlikely to Occur.	No impact anticipated.
Black Bittern lxobrychus flavicollis	P1	-	Freshwater pools, swamps and lagoons, well screened with trees. Shelters in dense waterside vegetation.	No/Marginal	Unlikely to Occur but may occur very occasionally.	No impact anticipated.
Little Bittern Ixobrychus minutus	P4	-	Dense vegetation surrounding/within freshwater pools, swamps and lagoons, well screened with trees. Shelters in dense beds of <i>Typha, Baumea</i> and tall rushes in freshwater swamps around lakes and along rivers.	No/Marginal	Unlikely to Occur but may occur very occasionally.	No impact anticipated.
Carnaby's Cockatoo Calyptorhynchus latirostris	S2	EN	Forests, woodlands, heathlands, farms; feeds on Banksia, Hakea and Marri.	Yes	Known to Occur.	Loss/modification of a small areas of habitat. and therefore, likely low level of impact to population
Baudin's Cockatoo Calyptorhynchus baudinii	S2	EN	Mainly eucalypt forests where it feeds primarily on the marri seeds.	Yes	Known to Occur.	Loss/modification of a small areas habitat and therefore likely low level of impact to population.
Forest Red-tailed Black Cockatoo Calyptorhynchus banksii naso	S3	VU	Eucalypt forests, feeds on marri, jarrah, blackbutt, karri, sheoak and snottygobble.	Yes	Possibly Occurs.	Loss/modification of a small areas of habitat and therefore likely low level of impact to population.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Potential Impacts
	WC Act/ DBCA Priority	EPBC Act				
Fork-tailed Swift Apus pacificus	S5	Ma, Mig	Low to very high airspace over varied habitat from rainforest to semi desert.	Yes	Unlikely to Occur, Flyover only on very rare occasions.	No impact.
Grey Wagtail Motacilla cinerea	S5	Mig, Ma	In Australia, near running water in disused quarries, sandy, rocky streams in escarpments and rainforest, sewerage ponds, ploughed fields and airfields.	No	Would Not Occur.	No impact.
Chuditch Dasyurus geoffroii	S3	VU	Forest, mallee shrublands, woodland and desert. The densest populations have been found in riparian jarrah forest.	No/Marginal	Unlikely to Occur, Locally extinct.	No impact anticipated.
South-western Brush- tailed Phascogale Phascogale tapoatafa wambenger	S6	-	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover.	Yes/Marginal	Possibly Occurs.	Loss/modification of a small area of habitat and therefore likely low level of impact to population. Potential for death/injury of individuals during clearing.
Quenda Isoodon fusciventer	P4	-	Dense scrubby, often swampy, vegetation with dense cover.	Yes/Marginal	Possibly Occurs.	Loss/modification of a small area of habitat and therefore likely low level of impact to population. Potential for death/injury of individuals during clearing.
Greater Bilby Macrotis lagotis	\$3	VU	Acacia shrublands, spinifex and hummock grassland. Mitchell grass and stony downs country if cracking clay, also desert sand plains and dune fields sometimes with spinifex hummock grassland and acacia shrubland.	No	Would Not Occur. Regionally extinct.	No impact.
Western Ringtail Possum Pseudocheirus occidentalis	S1	VU	Coastal peppermint, coastal peppermint-tuart, jarrah-marri associations, sheoak woodland, and eucalypt woodland and mallee.	Yes	Known to Occur.	Loss/modification of a small area of habitat and therefore likely low level of impact to population. Potential for death/injury of individuals during clearing.
Quokka Setonix brachyurus	S3	VU	Currently restricted to densely vegetated coastal heaths, swamps, riverine habitats including teatree thickets on sandy soils along creek systems.	No	Would Not Occur.	No impact.
Woylie Bettongia penicillata ogibyi	S1	EN	Open sclerophyll forest and woodland with a low, dense, understorey of tussock grasses or woody scrub.	No	Would Not Occur, Locally extinct	No impact.
Western Brush Wallaby Macropus irma	P4	-	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets.	Yes/Marginal	Possibly Occurs.	Loss/modification of a small areas of habitat and therefore likely low level of impact to population.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Potential Impacts	
	WC Act/ DBCA Priority	EPBC Act					
Western False Pipistrelle Falsistrellus mackenziei	P4	-	Wet sclerophyll forest dominated by karri and in high rainfall zones of the jarrah and marri forest.	Yes/Marginal	Possibly Occurs.	Loss/modification of a small area of habitat and therefore likely low level of impact to population.	
Water Rat Hydromys chrysogaster	P4	-	Permanent water, fresh, brackish or marine.	No/Marginal	Unlikely to Occur	No impact anticipated.	

See Appendix A for conservation status codes

7. CONCLUSION

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

The assessment has identified relatively small areas of "potential" black cockatoo breeding and foraging habitat within the subject site and the presence of the WRP. A number of additional federal and/or state listed threatened and DBCA priority fauna species may also occur though in most cases their use of the subject site wasn't detected during the survey period.

With respect to native vertebrate fauna, 17 mammal (including nine bat species), 107 bird, 23 reptile and nine frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the subject site at times, a conclusion largely based on the presence of apparently suitable habitat. Overall fauna habitat quality appears to be relatively low given the areas high level of historical disturbance and as a consequence the fauna assemblage is likely to be depleted, relative to the areas original biodiversity.

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

- Baudin's cockatoo Endangered (WA/Federal)
- Carnaby's cockatoo Endangered (WA/Federal)
- WRP Critically Endangered (WA), Vulnerable (Federal).

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

- coastal plains skink Priority 3 (WA)
- Forest red-tailed black cockatoo Vulnerable (WA/Federal)
- peregrine falcon Schedule 7 (WA)
- south-western brush-tailed phascogale S6 (WA)
- quenda Priority 4 (WA)
- western brush wallaby Priority 4 (WA)
- western false pipistrelle Priority 4 (WA).

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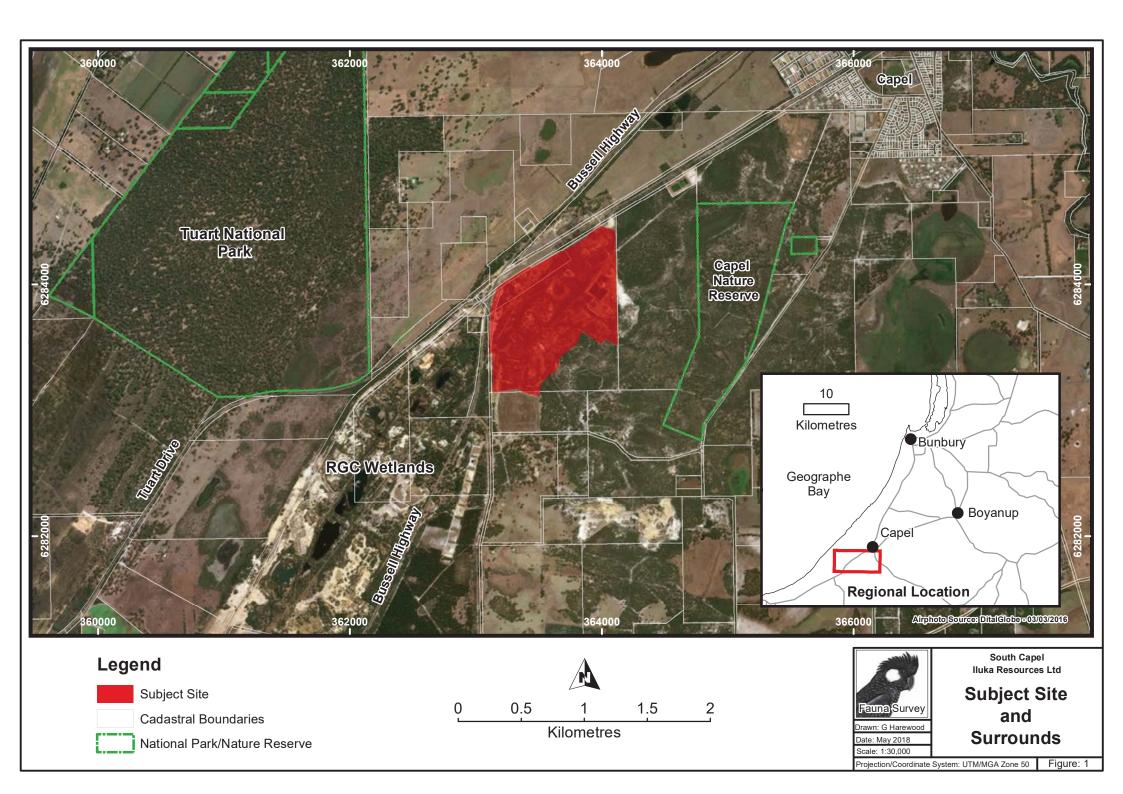
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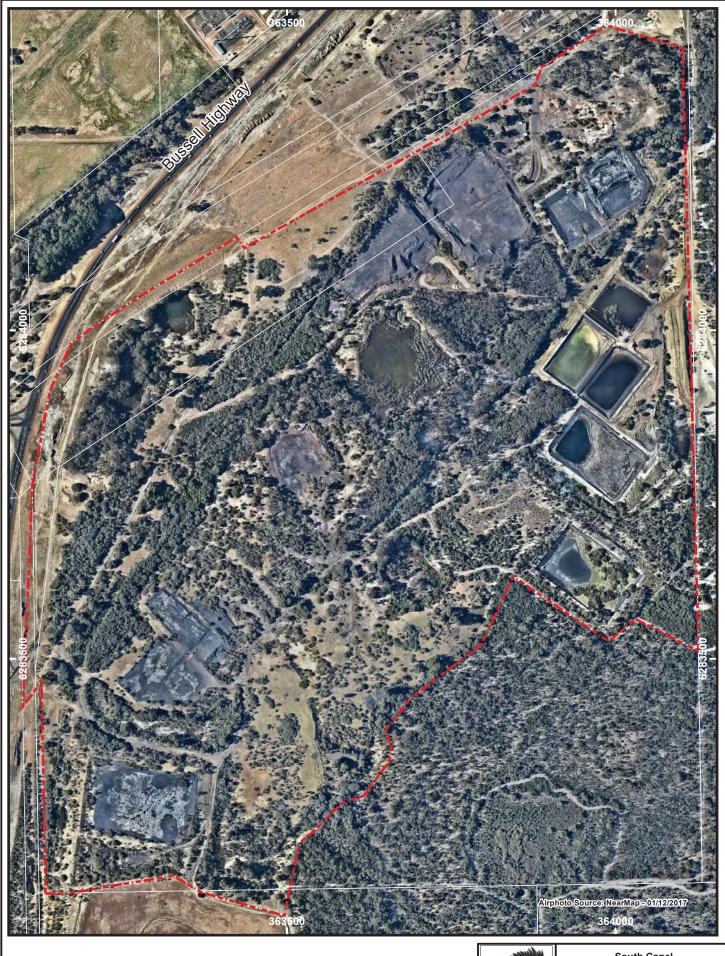
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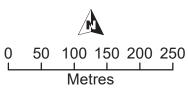
FIGURES









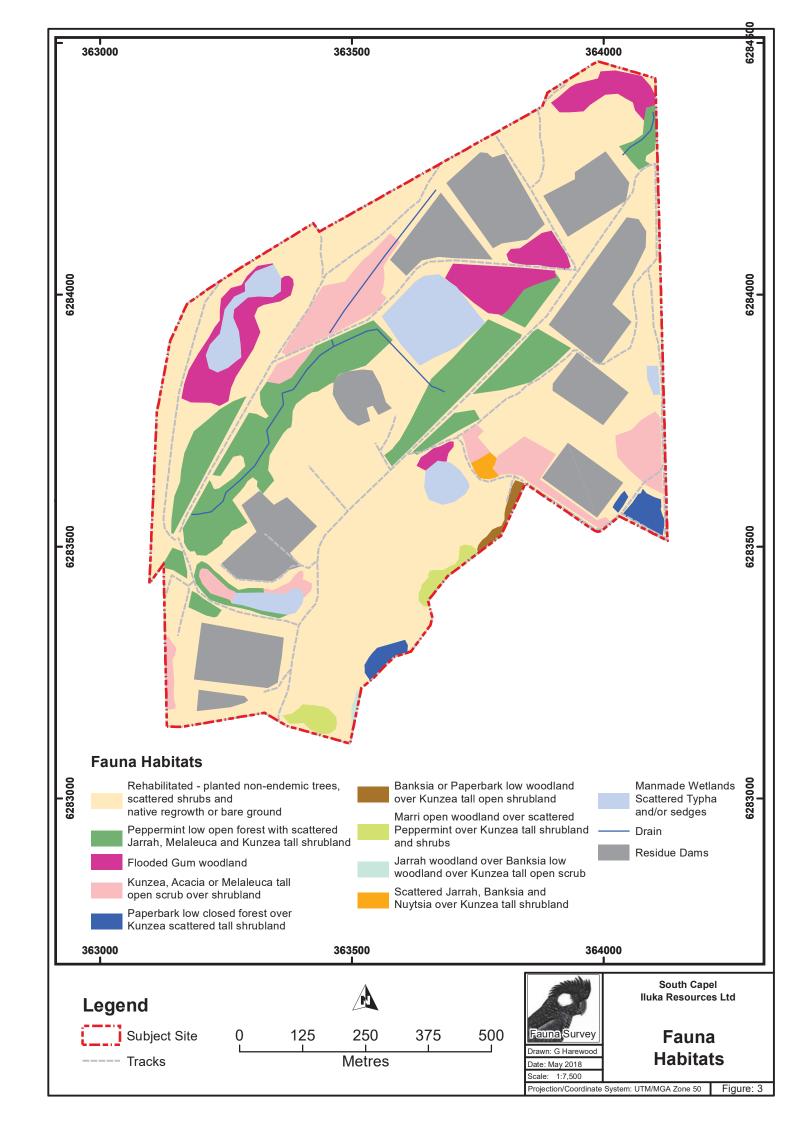


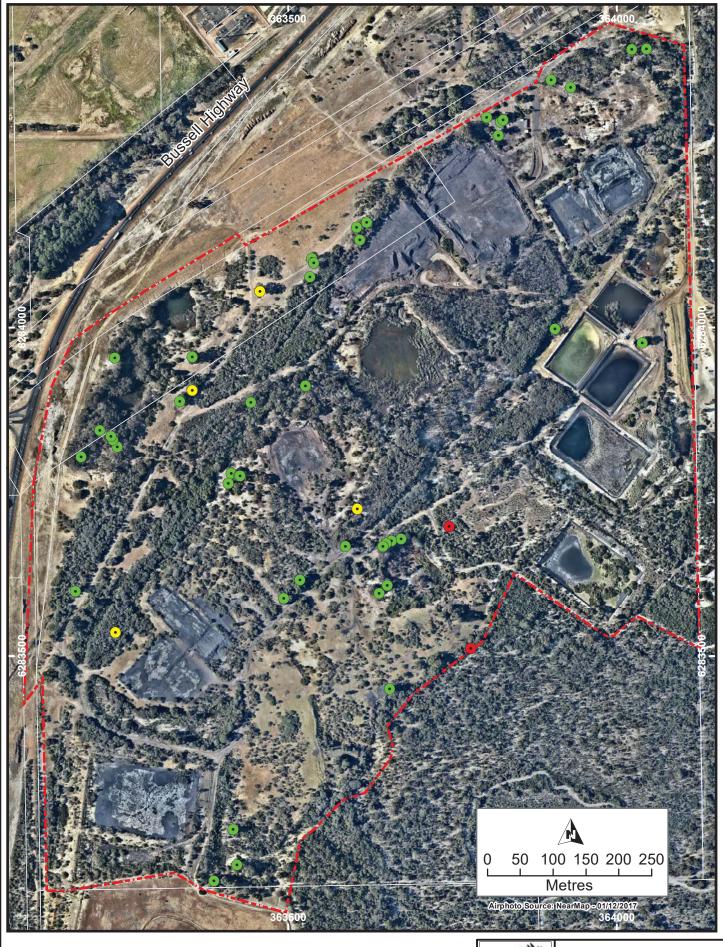


South Capel Iluka Resources Ltd

Subject Site **Air Photo**

Projection/Coordinate System: UTM/MGA Zone 50 Figure: 2





Legend



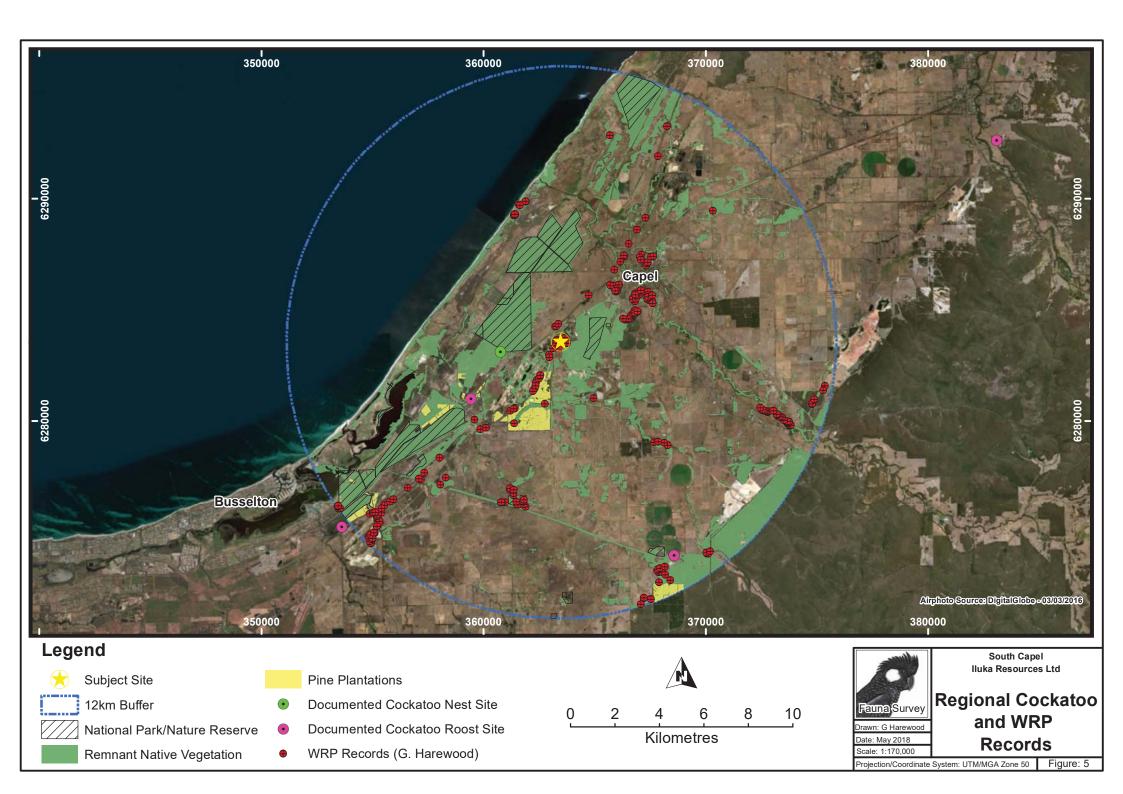
- Habitat Tree One or more large hollows possibly suitable for black cockatoos
- Habitat Tree One or more possible small/medium hollows
- Habitat Tree No hollows seen

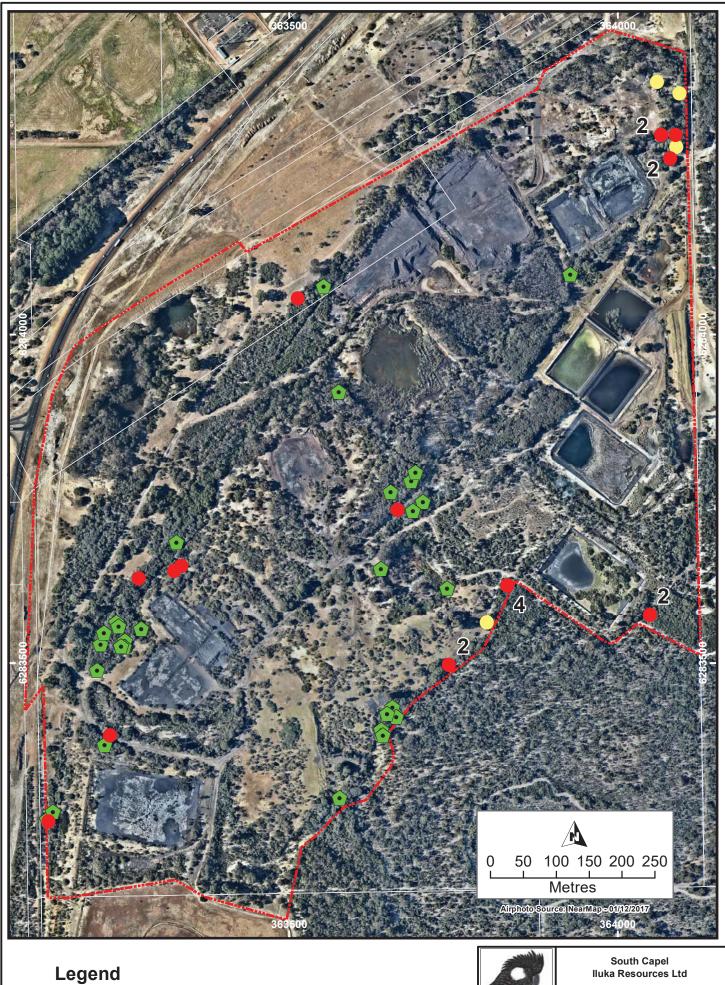


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Habitat Trees (DBH>50cm)

Projection/Coordinate System: UTM/MGA Zone 50 Figure: 4









Western Ringtail Possum Common Brushtail Possum



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Possum **Observations**

Projection/Coordinate System: UTM/MGA Zone 50 Figure: 6

APPENDIX A

CONSERVATION CATEGORIES

EPBC Act (1999) Threatened Fauna Categories

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

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

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

Wildlife Conservation (Specially Protected Fauna) Notice 2015 Categories

Published as Specially Protected under the *Wildlife Conservation Act 1950*, and listed under Schedules 1 to 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

Category	Code	Description
Schedule 1 Critically Endangered	CR	Threatened species considered to be facing an extremely high risk of extinction in the wild.
species Schedule 2		
Endangered species	EN	Threatened species considered to be facing a very high risk of extinction in the wild.
Schedule 3 Vulnerable species	VU	Threatened species considered to be facing a high risk of extinction in the wild.
Schedule 4 Presumed extinct species	EX	Species which have been adequately searched for and there is no reasonable doubt that the last individual has died.
Schedule 5 Migratory birds protected under an international agreement	IA	Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds.
Schedule 6 Fauna that is of special conservation need as conservation dependent fauna	CD	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
Schedule 7 Other specially protected fauna.	OS	Fauna otherwise in need of special protection to ensure their conservation.

Western Australian DBCA Priority Fauna Categories

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened flora or fauna.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

Category	Code	Description
Priority 1 Poorly Known Species.	P1	Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Priority 2 Poorly Known Species.	P2	Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
Priority 3 Poorly Known Species.	P3	Species that are known from several locations and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
Priority 4 Rare, Near Threatened and other species in need of monitoring.	P4	 (a) Rare: Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened: Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
		(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

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

IUCN Red List Threatened Species Categories

The *IUCN Red List of Threatened Species* $^{\text{TM}}$ is a checklist of taxa that have undergone an extinction risk assessment using the *IUCN Red List Categories and Criteria*.

Categories are summarized below.

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

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

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

APPENDIX B

OBSERVED AND POTENTIAL VERTEBRATE FAUNA LISTING

Observed and Potential Vertebrate Fauna Listing

South Capel, Capel -WA

Approx. centroid = 115.52887°E, 33.57899°S Compiled by Greg Harewood - March 2018 Recorded (Captured/Sighted/Heard/Signs) = X

A = Harewood, G (2018). Fauna Assessment South Capel. Unpublished report for Iluka Resources Ltd. May 2018.

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

Harewood, G (2017). Fauna Assessment Lot 3833 (Part) Hyder Road. Unpublished report for Iluka Resources Limited. February 2017

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

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

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

F = Harewood, G (2008). Fauna Assessment Survey - Lot 187 Stratham. Unpublished report for MBS Environnmental. January 2008.

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

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

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

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

K = DBCA (2017). NatureMap Database search. "By Circle" 115° 31' 44" E, 33° 34' 44" S (plus 20km buffer). 19/12/2017.

Class Family Species	Common Name	Conservation Status	Α	В	С	D	E	F	G	Н	I	J	K
Amphibia													
Myobatrachidae Ground or Burrowing Frogs													
Crinia georgiana	Quacking Frog	LC					Х		Χ	Χ		Χ	X
Crinia glauerti	Clicking Frog	LC		Х		Х	Х		Χ			Χ	Χ
Crinia insignifera	Squelching Froglet	LC			Х	Х	Х	Х	Х	Χ	X	X	Χ
Geocrinia leai	Ticking Frog	LC											Χ
Heleioporus eyrei	Moaning Frog	LC		Х	Х	Х	Х	Х	Х	Χ	X	X	Χ
Limnodynastes dorsalis	Western Banjo Frog	LC	Х		Х	Х		Х		Х	X	Χ	Χ
Pseudophryne guentheri	Crawling Toadlet	LC					Х	Х				Х	Х

lass Family Species	Common Name	Conservation Status	А	В	С	D	E	F	G	Н	I	J	K
Hylidae Tree or Water-Holding Frogs													
Litoria adelaidensis	Slender Tree Frog	LC		Х		Χ	Х	X	Χ			Χ	X
Litoria moorei	Motorbike Frog	LC		Χ		Χ		Х					Χ
eptilia													
Gekkonidae Geckoes													
Christinus marmoratus	Marbled Gecko				Х	Х	Х	Х	X	Х	Х	Х	Χ
Pygopodidae Legless Lizards													
Aprasia repens	Sandplain Worm Lizard									Χ		Χ	Χ
Lialis burtonis	Burton's Legless Lizard						Х		X			Х	X
Pygopus lepidopodus	Common Scaly Foot												Χ
Agamidae Dragon Lizards													
Pogona minor	Western Bearded Dragon				Χ		Χ		Χ	Χ		Χ	Χ
Pogona minor minima	Dwarf Bearded Dragon												
Varanidae Monitor's or Goanna's													
Varanus gouldii	Sand Monitor							X			Χ		Χ
Varanus rosenbergi	Heath Monitor				Х		Х			Χ		Х	Х

Class Family Species	Common Name	Conservation Status	А	В	С	D	E	F	G	Н	1	J	K
Scincidae Skinks													
Acritoscincus trilineatum	Southwestern Cool Skink				Χ	Χ	Χ		Χ	Χ		Χ	
Cryptoblepharus buchananii	Fence Skink			Χ	Χ	Χ	Χ	Х	Х	Χ	Χ		Х
Ctenotus ora	Coastal Plains Skink	P3			Х		Χ		Х	X		Х	
Egernia kingii	King's Skink				Х		Χ	Х	Х			Х	Х
Egernia napoleonis	Salmon-bellied Skink				Х			Х		Χ			X
Hemiergis gracilipes	Southwestern Mulch Skink								Х				Х
Hemiergis peronii tridactyla	Three-toed Earless Skink				Х	Х	Х		Х		Х	Х	
Hemiergis quadrilineata	Two-toed Mulch Skink							Х					Х
Lerista elegans	West Coast Four-toed Lerista				Х	Х	Х	Х	Х	Х	Х		Х
Menetia greyii	Dwarf Skink				Х		Х	Х	Х	Х	Х	Х	Х
Morethia lineoocellata	West Coast Pale-flecked Morethi	а			Х		Х	Х	Х	Х	Х	Х	Х
Tiliqua rugosa	Bobtail			Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Typhlopidae Blind Snakes													
Anilos australis	Southern Blind Snake				Х	Χ	Χ		Х	X	Χ	Х	

Class Family Species	Common Name	Conservation Status	Α	В	С	D	Е	F	G	Н	I	J	K
Elapidae Elapid Snakes													
Notechis scutatus	Tiger Snake							Х	Х			Χ	Х
Pseudonaja affinis	Dugite				X	X		Х			Х	X	Х
Aves													
Casuariidae Emus, Cassowarries													
Dromaius novaehollandiae	Emu	Вр LC	Χ	Х	Χ		Х		Х	Х			Χ
Phasianidae Quails, Pheasants													
Coturnix pectoralis	Stubble Quail	LC		X	X	X							Х
Coturnix ypsilophora	Brown Quail	LC							Х				
Anatidae Geese, Swans, Ducks													
Anas gracilis	Grey Teal	LC		Χ		Χ			Χ			Χ	Χ
Anas superciliosa	Pacific Black Duck	LC	X	Х		X	Х		Х			Χ	X
Chenonetta jubata	Australian Wood Duck	LC		Х	Х	Х	Х		Х			Х	Х
Tadorna tadornoides	Australian Shelduck	LC		Х	Х	Х	Х				Х	Х	Х

lass Family Species	Common Name	Conservation Status	А	В	С	D	E	F	G	Н	I	J	K
Phalacrocoracidae Cormorants													
Phalacrocorax melanoleucos	Little Pied Cormorant	LC		X									
Phalacrocorax sulcirostris	Little Black Cormorant	LC					Χ						Х
Ardeidae Herons, Egrets, Bitterns													
Ardea alba	Great Egret	CA JA		Χ									
Ardea novaehollandiae	White-faced Heron	LC		Х	Х	Χ	Х		Χ			Χ	
Ardea pacifica	White-necked Heron	LC		Х		Х							Х
Threskiornithidae libises, Spoonbills													
Platalea flavipes	Yellow-billed Spoonbill	LC		Χ		Χ							Χ
Threskiornis molucca	Australian White Ibis	LC		Х	Х	Х						Х	
Threskiornis spinicollis	Straw-necked Ibis	LC		Х	Х	Х	Х		Х			Х	Χ

lass Family Species	Common Name	Conservation Status	А	В	С	D	E	F	G	Н	I	J	K
Accipitridae Kites, Goshawks, Eagles, Harriers													
Accipiter cirrocephalus	Collared Sparrowhawk	Bp LC			Х						Χ		X
Accipiter fasciatus	Brown Goshawk	Bp LC		Х				Х		Χ	Х		Х
Aquila audax	Wedge-tailed Eagle	Bp LC			Х	Х	Х	Х	Χ		Χ	Χ	Х
Aquila morphnoides	Little Eagle	Bp LC		Х							X		
Circus approximans	Swamp Harrier	LC		Х				Х	Х				Х
Circus assimilis	Spotted Harrier	LC											Х
Elanus caeruleus	Black-shouldered Kite	LC		Х									Х
Haliastur sphenurus	Whistling Kite	Bp LC		Х		Х	Х	Х			Х		X
Hamirostra isura	Square-tailed Kite	Bp LC											
Falconidae Falcons													
Falco berigora	Brown Falcon	Bp LC		Х							Χ		X
Falco cenchroides	Australian Kestrel	LC		Х	Х	Х		Х	Х				Х
Falco longipennis	Australian Hobby	LC						Х	Х				Х
Falco peregrinus	Peregrine Falcon	S7 Bp LC											X

lass Family Species	Common Name	Conservation Status	A	В	С	D	E	F	G	Н	ı	J	K
Rallidae Rails, Crakes, Swamphens, Coots													
Fulica atra	Eurasian Coot	LC		Х									Х
Gallinula tenebrosa	Dusky Moorhen	Bh LC							Х				Х
Gallirallus philippensis	Buff-banded Rail	LC											Х
Porphyrio porphyrio	Purple Swamphen	LC		Х									Х
Turnicidae Button-quails													
Turnix varia	Painted Button-quail	Bp LC											
Recurvirostridae Stilts, Avocets													
Himantopus himantopus	Black-winged Stilt	LC		Χ									X
Charadriidae Lapwings, Plovers, Dotterels													
Charadrius melanops	Black-fronted Dotterel	LC	X			Χ							
Erythrogonys cinctus	Red-kneed Dotterel	LC				Х							Х
Vanellus miles	Masked Lapwing	LC											Х
Vanellus tricolor	Banded Lapwing	LC		Х									Х

Class Family Species	Common Name	Conservation Status	A	В	С	D	E	F	G	Н	ı	J	K
			A	Ь				Г	<u> </u>		'	J	K
Columbidae Pigeons, Doves													
Columba livia	Domestic Pigeon	Introduced											X
Ocyphaps lophotes	Crested Pigeon	LC		Χ	Χ	Х	Х		Х			Χ	X
Phaps chalcoptera	Common Bronzewing	Bh LC	Х	Χ	Χ	Х	Х	Х	Х	Χ	Χ	Χ	X
Streptopelia senegalensis	Laughing Turtle-Dove	Introduced							Х				X
Psittacidae Parrots													
Cacatua roseicapilla	Galah	LC		Χ				Χ					X
Cacatua sanguinea	Little Corella	LC		Χ									Χ
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo	S3 VU Be		Х	X		Х	Х	Х	Χ		Χ	
Calyptorhynchus baudinii	Baudin's Black Cockatoo	S2 EN Bp EN A3cde	Х	Х	Х	Х	Х		Х			Χ	X
Calyptorhynchus latirostris	Carnaby's Black Cockatoo	S2 EN Bp EN A2bcde	Х	Х	Х	Х	Х	X	Х	Χ	Χ	Χ	X
Glossopsitta porphyrocephala	Purple-crowned Lorikeet	LC			Х					Χ			
Neophema elegans	Elegant Parrot	LC		Х	Х	Х	Х		Х	Χ			X
Platycercus icterotis icterotis	Western Rosella (western ssp)	Bp LC					Х		Х		Х		
Platycercus spurius	Red-capped Parrot	LC	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Platycercus zonarius	Australian Ringneck	LC	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Polytelis anthopeplus	Regent Parrot	LC				Х		Х	Х		Х	Х	X

lass Family Species	Common Name	Conservation Status	Α	В	С	D	E	F	G	Н	ı	J	K
Cuculidae Parasitic Cuckoos													
Cacomantis flabelliformis	Fan-tailed Cuckoo	LC					Χ	Х			Х	Х	Х
Chrysococcyx basalis	Horsfield's Bronze Cuckoo	LC					Х		Χ				Х
Chrysococcyx lucidus	Shining Bronze Cuckoo	LC			Х		Х		X		Х	Х	X
Cuculus pallidus	Pallid Cuckoo	LC		X			Х					Х	
Strigidae Hawk Owls													
Ninox novaeseelandiae	Boobook Owl	LC		Χ	Χ	Х	Χ				Х		
Tytonidae Barn Owls													
Tyto alba	Barn Owl	LC		Х									Χ
Podargidae Frogmouths													
Podargus strigoides	Tawny Frogmouth	LC		Х			Χ				Х		Х
Caprimulgidae Nightjars													
Eurostopodus argus	Spotted Nightjar	LC											Χ
Aegothelidae Owlet-nightjars													
Aegotheles cristatus	Australian Owlet-nightjar	LC											Χ

lass Family Species	Common Name	Conservation Status	А	В	С	D	E	F	G	Н	I	J	K
Halcyonidae Tree Kingfishers													
Dacelo novaeguineae	Laughing Kookaburra	Introduced	X	Χ	Х	Х	Χ	Х	Χ	Χ	Х	Х	Х
Todiramphus sanctus	Sacred Kingfisher	LC					Х				Х	Х	Х
Meropidae Bee-eaters													
Merops ornatus	Rainbow Bee-eater	JA LC	X	Χ	Χ	Χ	Χ	Χ	Х	Χ	Χ	Χ	X
Maluridae Fairy Wrens, GrassWrens													
Malurus splendens	Splendid Fairy-wren	Bh LC	X	Χ	Χ	Χ	Χ	Χ	Х	Χ	Χ	Χ	Х
Acanthizidae Thornbills, Geryones, Fieldwrens & Whitefaces													
Acanthiza apicalis	Broad-tailed Thornbill	Bh LC	X	Χ	X		Х	Х	Х	Χ	Х	Х	Х
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Bh LC		Х	X	Х	Х	Х	Χ		Х	Х	Х
Acanthiza inornata	Western Thornbill	Bh LC							Х	Х			Х
Gerygone fusca	Western Gerygone	LC	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Sericornis frontalis	White-browed Scrubwren	Bh LC			Х	Х	Х	Х	Х	Х	Х		Х
Smicrornis brevirostris	Weebill	Bh LC		Х	Х		Х	Х		Χ	Х		Х

Class Family Species	Common Name	Conservation Status	А	В	С	D	E	F	G	Н	I	J	K
Pardalotidae Pardalotes													
Pardalotus punctatus	Spotted Pardalote	LC					Х		Х		X		X
Pardalotus striatus	Striated Pardalote	LC		Х	X	Х	Х	Х	Х	Х	Х	Х	X
Meliphagidae Honeyeaters, Chats													
Acanthorhynchus superciliosus	Western Spinebill	LC			Χ		Χ		Χ	Χ	Χ	Χ	Χ
Anthochaera carunculata	Red Wattlebird	LC		Χ	Χ	Χ		Χ	X	Χ	X	Х	Χ
Anthochaera lunulata	Western Little Wattlebird	Bp LC		Χ									Χ
Epthianura albifrons	White-fronted Chat	LC							Х				Χ
Lichenostomus virescens	Singing Honeyeater	LC					Х			Х			
Lichmera indistincta	Brown Honeyeater	LC		X	X	X	Х		Х	Х	Х	Х	Χ
Phylidonyris nigra	White-cheeked Honeyeater	Bp LC							Х				
Phylidonyris novaehollandiae	New Holland Honeyeater	Bp LC		X	Χ	X	Х		Х	Х		Х	Χ
Petroicidae Australian Robins													
Eopsaltria georgiana	White-breasted Robin	Bh LC	X				Х		X				X
Eopsaltria griseogularis	Western Yellow Robin	Bh LC			X		Х	Х	Х				
Petroica multicolor	Scarlet Robin	Bh LC		X	Х	Х	Х	Х	Х	Х	Х		

Class Family Species	Common Name	Conservation Status	А	В	С	D	E	F	G	Н	I	J	K
Neosittidae Sitellas													
Daphoenositta chrysoptera	Varied Sittella	Bh LC			X		Х		Х		Х		Х
Pachycephalidae Crested Shrike-tit, Crested Bellbird, Shrike Thi	rushes, Whistlers												
Colluricincla harmonica	Grey Shrike-thrush	Bh LC		Χ	Χ		Χ	Χ	Χ	Χ	Χ		Χ
Pachycephala pectoralis	Golden Whistler	Bh LC		Χ	Χ	Х	Х	Х	Х	Χ	Х		
Pachycephala rufiventris	Rufous Whistler	LC	Х	Χ	Χ		Х	Х	Х		Х	Х	Х
Dicruridae Monarchs, Magpie Lark, Flycatchers, Fantails,	Drongo												
Grallina cyanoleuca	Magpie-lark	LC		Χ	Χ	Χ		Χ	Х			Х	Х
Rhipidura fuliginosa	Grey Fantail	LC	X	Х	X	Х	Х	Х	Х	Х	Х	Х	
Rhipidura leucophrys	Willie Wagtail	LC		Х	X	Х	Х	Х	Х	Х	Х	Х	Х
Campephagidae Cuckoo-shrikes, Trillers													
Coracina novaehollandiae	Black-faced Cuckoo-shrike	LC	X	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Х
Lalage tricolor	White-winged Triller	LC		Х									Х
Artamidae Woodswallows, Butcherbirds, Currawongs													
Artamus cinereus	Black-faced Woodswallow	Вр LC		Х				Х	Х		Х	Х	Х
Artamus cyanopterus	Dusky Woodswallow	Bp LC		Х			Х		Х	Х			Х

lass Family Species	Common Name	Conservation Status	А	В	С	D	E	F	G	Н	ı	J	K
Cracticidae Currawongs, Magpies & Butcherbirds													
Cracticus tibicen	Australian Magpie	LC	Х	Х	Χ	Χ	Х	Χ	Χ	Χ	Х	Χ	Х
Cracticus torquatus	Grey Butcherbird	LC		Х	Х	Х	Х	Х	Х		Х	Χ	X
Strepera versicolor	Grey Currawong	Bp LC			Х		Х						X
Corvidae Ravens, Crows													
Corvus coronoides	Australian Raven	LC	Х	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Х	Χ	X
Motacillidae Old World Pipits, Wagtails													
Anthus australis	Australian Pipit	LC		Х	Χ	Χ	Χ		Χ				
Dicaeidae Flowerpeckers													
Dicaeum hirundinaceum	Mistletoebird	LC											Х
Hirundinidae Swallows, Martins													
Hirundo ariel	Fairy Martin	LC		Х									
Hirundo neoxena	Welcome Swallow	LC		Х	Х	Х		Х	Х	Χ		Χ	X
Hirundo nigricans	Tree Martin	LC		Х	Х	Х	Х	Х	Х			Х	

Class Family Species	Common Name	Conservation Status	A	В	С	D	E	F	G	Н	ı	J	K
•								'		'''	'		IX
Sylviidae Old World Warblers													
Acrocephalus australis	Australian Reed Warbler	LC											Χ
Cincloramphus cruralis	Brown Songlark	LC			Х								
Cincloramphus mathewsi	Rufous Songlark	LC										Х	
Megalurus gramineus	Little Grassbird	LC											Х
Zosteropidae White-eyes													
Zosterops lateralis	Silvereye	LC	X	Х			Χ	Х	Χ	Χ	Х	Χ	X
Mammalia													
Tachyglossidae Echidnas													
Tachyglossus aculeatus	Echidna	LC		Χ			Χ	X		Χ			
Dasyuridae Carnivorous Marsupials													
Antechinus flavipes	Yellow-footed Antechinus, Mardo				Χ				Χ	Χ			
Phascogale tapoatafa wambenger	SW Brush-tailed Phascogale	S6			Х	Х		Х					
Peramelidae Bandicoots													
Isoodon fusciventer	Quenda	P4 LC		Х	Х		Χ		Х	Х	Χ	Х	

lass Family Species	Common Name	Conservation Status	А	В	С	D	E	F	G	Н	1	J	K
Phalangeridae Brushtail Possums, Cuscuses													
Trichosurus vulpecula	Common Brushtail Possum	LC	Χ	X	Х	Х	Х	X	Χ	Χ	X	Χ	X
Pseudocheiridae Ringtail Posssums													
Pseudocheirus occidentalis	Western Ringtail Possum	S1 VU CR A2bce+3bce	e+4b%	Χ		Χ	Χ	Χ			Χ		X
Macropodidae Kangaroos, Wallabies													
Macropus fuliginosus	Western Grey Kangaroo	LC	X	Χ	Χ	Х	Χ	Х	Х	Χ	Х	Χ	X
Macropus irma	Western Brush Wallaby	P4 LC			Х		Х			Χ			Х
Molossidae Freetail Bats													
Austronomus australis	White-striped Freetail-bat	LC		Χ	Χ	Χ			Χ	Χ	X		
Ozimops kitcheneri	South-western Freetail-bat	LC			Х	Х							

Class Family Species	Common Name	Conservation Status	A	В	С	D	E	F	G	Н	ı	J	K
Vespertilionidae								•		•••	•		
Ordinary Bats													
Chalinolobus gouldii	Gould's Wattled Bat	LC			Χ	Χ	Χ	Χ					Χ
Chalinolobus morio	Chocolate Wattled Bat	LC			Х	Х	Х			Х			
Falsistrellus mackenziei	Western False Pipistrelle	P4 NT						Х	Χ				Χ
Nyctophilus geoffroyi	Lesser Long-eared Bat	LC			Х	Х	Х	Х					
Nyctophilus gouldi	Gould's Long-eared Bat	LC				Х		Х		Х	Х		
Nyctophilus major	Western Long-eared Bat	LC									Х		
Vespadelus regulus	Southern Forest Bat	LC			Х	Х	Х	Х	Х	Х			Χ
Muridae Rats, Mice													
Mus musculus	House Mouse	Introduced			Χ	Х	Х		Х		Х	Χ	X
Rattus rattus	Black Rat	Introduced			Х	Х	Х	Х			Х		Χ
Canidae Dogs, Foxes													
Vulpes vulpes	Red Fox	Introduced		Χ	X	Х	Х	X			X	Χ	X
Felidae Cats													
Felis catus	Cat	Introduced		X		Х	Х	X			X		Х

Class Family Species	Common Name	Conservation Status	А	В	С	D	E	F	G	Н	I	J	K
Suidae Pigs													
Sus scrofa	Pig	Introduced		Х	Х								
Leporidae Rabbits, Hares													
Oryctolagus cuniculus	Rabbit	Introduced	Х	X	Х	Х	X	X	X	Χ	Х	Х	Х

APPENDIX C

DBCA & EPBC ACT DATABASE SEARCH RESULTS



Amphibian

NatureMap - South Capel

Created By Greg Harewood on 15/03/2018

Kingdom Animalia

Current Names Only Yes

Core Datasets Only Yes

Method 'By Circle'

Centre 115° 31' 44" E,33° 34' 44" S

Buffer 20km

Group By Species Group

Species Group	Species	Records
Amphibian	11	115
Bird	213	11982
Fish	87	192
Invertebrate	168	688
Mammal	38	1880
Reptile	43	284
TOTAL	560	15141

Name ID Species Name

Naturalised Conservation Code ¹Endemic To Query Area

1.	25398 Crinia georgiana (Quacking Frog)		
2.	25399 Crinia glauerti (Clicking Frog)		
3.	25400 Crinia insignifera (Squelching Froglet)		
4.	25401 Crinia pseudinsignifera (Bleating Froglet)		
5.	25404 Geocrinia leai (Ticking Frog)		
6.	25410 Heleioporus eyrei (Moaning Frog)		
7.	25415 Limnodynastes dorsalis (Western Banjo Frog)		
8.	25378 Litoria adelaidensis (Slender Tree Frog)		
9.	25388 Litoria moorei (Motorbike Frog)		
10.	25419 Metacrinia nichollsi (Forest Toadlet)		
11.	25433 Pseudophryne guentheri (Crawling Toadlet)		
Bird			
12.	24260 Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)		
13.	24261 Acanthiza apicalis (Broad-tailed Thornbill) 24261 Acanthiza chrysorrhoa (Yellow-rumped Thornbill)		
14.	24261 Acanthiza chrysonnoa (Tellow-lumped Thornbill)		
15.	24560 Acanthorhynchus superciliosus (Western Spinebill)		
16.	25535 Accipiter cirrocephalus (Collared Sparrowhawk)		
17.	24281 Accipiter cirrocephalus subsp. cirrocephalus (Collared Sparrowhawk)		
18.	25536 Accipiter fasciatus (Brown Goshawk)		
19.	25755 Acrocephalus australis (Australian Reed Warbler)		
20.	41323 Actitis hypoleucos (Common Sandpiper)	IA	
21.	25544 Aegotheles cristatus (Australian Owlet-nightjar)	IA	
22.	24310 Anas castanea (Chestnut Teal)		
23.	24312 Anas gracilis (Grey Teal)		
24.	24313 Anas platyrhynchos (Mallard)		
25.	24315 Anas rhynchotis (Australasian Shoveler)		
26.	24316 Anas superciliosa (Pacific Black Duck)		
27.	47414 Anhinga novaehollandiae (Australasian Darter)		
28.	24505 Anous stolidus subsp. pileatus (Common Noddy)	IA	
29.	24506 Anous tenuirostris subsp. melanops (Australian Lesser Noddy)	Т	
30.	24561 Anthochaera carunculata (Red Wattlebird)	·	
31.	24562 Anthochaera lunulata (Western Little Wattlebird)		
32.	24285 Aquila audax (Wedge-tailed Eagle)		
33.	25558 Ardea ibis (Cattle Egret)	IA	
34.	41324 Ardea modesta (great egret, white egret)	IA	
35.	24341 Ardea pacifica (White-necked Heron)		
36.	24610 Ardeotis australis (Australian Bustard)		
37.	25566 Artamus cinereus (Black-faced Woodswallow)		
38.	24353 Artamus cyanopterus (Dusky Woodswallow)		
39.	24318 Aythya australis (Hardhead)		
		Department of	*****

NatureMap is a collaborative project of the Department of Parks and Wildlife and the Western Australian Museum.







	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
40. 41.	2/310	Barnardius zonarius Piziura Johata (Musik Duck)			
41.		Biziura lobata (Musk Duck) Botaurus poiciloptilus (Australasian Bittern)		Т	
43.		Cacatua pastinator (Western Long-billed Corella)		'	
44.		Cacatua roseicapilla (Galah)			
45.	25716	Cacatua sanguinea (Little Corella)			
46.	25598	Cacomantis flabelliformis (Fan-tailed Cuckoo)			
47.		Cacomantis pallidus (Pallid Cuckoo)			
48. 49.		Calidris acuminata (Sharp-tailed Sandpiper) Calidris ferruginea (Curlew Sandpiper)		IA T	
50.		Calidris ruficollis (Red-necked Stint)		T IA	
51.		Calidris subminuta (Long-toed Stint)		IA	
52.	25717	Calyptorhynchus banksii (Red-tailed Black-Cockatoo)			
53.	24731	Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black-Cockatoo)		T	
54.	24733	Calyptorhynchus baudinii (Baudin's Cockatoo (long-billed black-cockatoo), Baudin's Cockatoo)		Т	
55.	24734	Calyptorhynchus latirostris (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)		Т	
56.	48400	Calyptorhynchus sp. (white-tailed black cockatoo)		Т	
57.		Charadrius leschenaultii (Greater Sand Plover)		IA	
58.		Characterius ruficapillus (Red-capped Plover)			
59. 60.		Chenonetta jubata (Australian Wood Duck, Wood Duck) Cheramoeca leucosterna (White-backed Swallow)			
61.	47303	Chroicocephalus novaehollandiae			
62.	24431	Chrysococcyx basalis (Horsfield's Bronze Cuckoo)			
63.	25601	Chrysococcyx lucidus (Shining Bronze Cuckoo)			
64.	24432	Chrysococcyx lucidus subsp. plagosus (Shining Bronze Cuckoo)			
65.		Circus aeruginosus			Υ
66.		Circus approximans (Swamp Harrier)			
67. 68.		Circus assimilis (Spotted Harrier) Cladorhynchus leucocephalus (Banded Stilt)			
69.		Colluricincla harmonica (Grey Shrike-thrush)			
70.		Columba livia (Domestic Pigeon)	Υ		
71.	25568	Coracina novaehollandiae (Black-faced Cuckoo-shrike)			
72.	25592	Corvus coronoides (Australian Raven)			
73.		Corvus coronoides subsp. perplexus (Australian Raven)			
74. 75.		Coturnix pectoralis (Stubble Quail) Cracticus nigrogularis (Pied Butcherbird)			
76.		Cracticus tibicen (Australian Magpie)			
77.		Cracticus torquatus (Grey Butcherbird)			
78.		Cygnus atratus (Black Swan)			
79.	30901	Dacelo novaeguineae (Laughing Kookaburra)	Υ		
80.		Dacelo novaeguineae subsp. novaeguineae (Laughing Kookaburra)	Υ		
81.		Daphoenositta chrysoptera (Varied Sittella)			
82. 83.		Daption capense (Cape Petrel) Dicaeum hirundinaceum (Mistletoebird)			
84.		Diomedea exulans (Wandering Albatross)		Т	
85.		Diomedea exulans subsp. exulans (Snowy Albatross)		Т	
86.	24470	Dromaius novaehollandiae (Emu)			
87.		Egretta garzetta			
88.		Egretta novaehollandiae			
89. 90.	24200	Elanus axillaris Elanus caeruleus subsp. axillaris (Australian Black-shouldered Kite)			
91.		Elseyornis melanops (Black-fronted Dotterel)			
92.		Eolophus roseicapillus			
93.	24651	Eopsaltria australis subsp. griseogularis (Western Yellow Robin)			
94.	24652	Eopsaltria georgiana (White-breasted Robin)			
95.		Epthianura albifrons (White-fronted Chat)			
96.		Erythrogonys cinctus (Red-kneed Dotterel)			
97. 98.		Eurostopodus argus (Spotted Nightjar) Falco berigora (Brown Falcon)			
99.		Falco cenchroides (Australian Kestrel, Nankeen Kestrel)			
100.		Falco cenchroides subsp. cenchroides (Australian Kestrel, Nankeen Kestrel)			
101.		Falco longipennis (Australian Hobby)			
102.	24474	Falco longipennis subsp. longipennis (Australian Hobby)			
103.		Falco peregrinus (Peregrine Falcon)		S	
104.		Fulica atra (Eurasian Coot)			
105. 106.		Gallinula tenebrosa (Dusky Moorhen) Gallirallus philippensis (Buff-banded Rail)			
107.		Gallirallus philippensis subsp. mellori (Buff-banded Rail)			







1906. 46314 Control virus (Charle) Processor		Name ID	Species Name Na	aturalised	Conservation Code	¹ Endemic To Query Area
1910						
111						
11.2						
14.5 Automotion of Processing Conference (American)						
116. 4750. Manamaten microphomotes (Bind wings) 401 117. 22173 Manamaten microphomotes (Bind wings) 401 118. 22173 Manamaten microphomotes (Bind wings) 401 119. Manamaten Microphomotes (Manamaten) 401 119. Manamaten Microphomotes (Manamaten) 401 120. 20175 Manamaten Microphomotes (Manamaten) 401 121. 20207 League reclored (Webber wings) 417 Tider) 122. 20207 League reclored (Webber wings) 417 Tider) 123. 20207 League reclored (Webber wings) 417 Tider) 124. 20207 League reclored (Webber wings) 417 Tider) 125. 20207 League reclored (Webber wings) 417 Tider) 126. 20207 League reclored (Webber wings) 417 Tider) 127. 20207 League reclored (Webber wings) 417 Tider) 128. 20207 League reclored (Section) 417 Tider) 129. 20207 League reclored (Section) 417 Tider) 120. 20207 League reclored (Section) 417 Tider) 120. 20207 Machanamaten (Section) 417 Tider) 121. 20207 Machanamaten (Section) 417 Tider) 122. 20207 Machanamaten (Section) 417 Tider) 123. 20207 Machanamaten (Section) 417 Tider) 124. 20207 Machanamaten (Section) 417 Tider) 125. 20207 Machanamaten (Section) 417 Tider) 126. 20208 Machanamaten (Section) 417 Tider) 127. 20208 Machanamaten (Section) 417 Tider) 128. 20208 Machanamaten (Section) 417 Tider) 129. 20208 Machanamaten (Section) 417 Tider) 120. 20209 Machanamaten (Section) 417 Tider) 121. 20209 Machanamaten (Section) 417 Tider) 122. 20209 Machanamaten (Section) 417 Tider) 123. 20209 Machanamaten (Section) 417 Tider) 124. 20209 Machanamaten (Section) 417 Tider) 125. 20209 Machanamaten (Section) 417 Tider) 126. 20209 Machanamaten (Section) 417 Tider) 127. 20209 Machanamaten (Section) 417 Tider) 128. 20209 Machanamaten (Section) 417 Tider) 129. 20209 Machanamaten (Section) 417 Tider) 120. 20209 Machanamaten (Section) 417 Tider) 120. 20209 Machanamaten (Section) 417 Tider) 121. 20209 Mac	113.	24293	Haliaeetus leucogaster (White-bellied Sea-Eagle)			
116.	114.	24295	Haliastur sphenurus (Whistling Kite)			
117. 2477 Namanton process (Wescone) Selection (Palace Averaged State)	115.	47965	Hieraaetus morphnoides (Little Eagle)			
118. 24-401 Historio Incornant (Wilstonion Seatoria)						
19.						
24-31		24491				
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12.2			Bittern)		P1	
24.55 Deligna centime (Selenterland)						
124. 2898 Lichmora inclassificate Governor Foodward					-	
125. 2574 Limition Immost (Black ethilor Glowler) 126 Light Control Blazer 127 24609 Micromactines grapmans (Southern Glown Parell) 128 24525 Micromactines grapmans (Southern Glown Parell) 129 25659 Micromactines grapmans (Southern Glown Duck) 129 25659 Micromactines grapmans (Southern Glown Duck) 130 25654 Micromactines (Spied off Fairy-wrant) 131 25659 Micromactines (Spied off Fairy-wrant) 132 25758 Micromactines (Spied off Fairy-wrant) 133 25659 Micromactines (Spied off Fairy-wrant) 134 24659 Micromactines developed services (Spied off Fairy-wrant) 135 Micromactine Reviews (Spied off Fairy-wrant) 136 25642 Micromactines developed services (Spied off Fairy-wrant) 137 25650 Micromactine Reviews (Spied off Fairy-wrant) 138 24753 Micromactine Reviews (Spied off Fairy-wrant) 138 24753 Micromactine Reviews (Spied off Fairy-wrant) 140 25654 Myrelianus catedorius (Rudicus Nigher Herror) 141 24042 October parelly (Robert Spied off Fairy-wrant) 141 24044 October parelly (Robert Spied off Fairy-wrantines (Robert Spied off Fairy-wra					1	
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190, 25850 Mahrus silegams (Red-Winged Fairy-went)		24690	•		IA	
130. 25654 Malurus spinrotens (Spender Fairy-ware)	128.					
131	129.	25650	Malurus elegans (Red-winged Fairy-wren)			
132	130.	25654	Malurus splendens (Splendid Fairy-wren)			
133	131.	24552	Malurus splendens subsp. splendens (Splendid Fairy-wren)			
134. 2458 Meropa ornatus (Fainhow Bae-mater) 1,4	132.	25758	Megalurus gramineus (Little Grassbird)			
135. Microcarbo melanoleucos 136. 25542 Milvus migrans (Black Kita) 137. 25510 Milysigra inquises (Resibess Flycatcher) 138. 24738 Noophema delogans (Elegant Parrot) 139. 24739 Noophema delogans (Elegant Parrot) 140. 25544 Nyciscorax calesdonicus (Rutusus Night Henon) 141. 24407 Ozyphaga kinphotes (Crestaet Pigenor) 142. 24328 Ozyura australis (Blue-billed Duck) 143. 25669 Pachycephala infiventris (Rutious Whistler) 144. 26669 Pachycephala infiventris (Rutious Whistler) 145. Pachycephala infiventris (Rutious Whistler) 146. Pachycephala infiventris (Rutious Whistler) 147. 24693 Pachypita bachler (Stender-billed Prion) 148. 25707 Pachypitia davis (Stender-billed Prion) 149. 24693 Pachypitia davisi (Stender-billed Prion) 140. 24695 Pachypitia davisi (Stender-billed Prion) 140. 24695 Pachypitia davisi (Stender-billed Prion) 140. 24696 Pachypitia davisi (Salvin's Prion) 140. 24697 Pachypitia davisi (Salvin's Prion) 150. 24698 Pachypitia utalia (Randel-Billed Prion) 151. 24697 Pachypitia utalia (Randel-Billed Prion) 152. Pardion cristatus 153. 25691 Pardiotius suriatus (Sortiad Pardiotie) 154. 25692 Pardiotius suriatus (Sortiad Pardiotie) 155. 24630 Pardiotius suriatus (Sortiad Pardiotie) 156. 24630 Pardiotius suriatus (Sortiad Pardiotie) 157. 48061 Perocholidon ingircans (Treo Marin) 158. 48060 Perocholidon ingircans (Treo Marin) 159. 24631 Pheleomocra varia (Field Commonant) 161. 24667 Pheleomocra varia (Field Commonant) 162. 25697 Pheleomocra varia (Field Commonant) 163. 24632 Pheleomocra varia (Field Commonant) 164. 24409 Phaga chalcopteria (Light marid Albarouss) 165. 24442 Photechidon inscriber (New Holland Honeywater) 166. 24451 Phylidonyris niger (White-checked Honeywater) 167. 4807 Phylidonyris niger (White-checked Honeywater) 168. 24462 Photechiden inscriber (New Holland Honeywater) 169. 24461 Philosoprous varia (Field Commonant) 161. 24467 Phylidonyris niger (White-checked Honeywater) 169. 24461 Phylidonyris niger (White-checked Honeywater) 170. 24476 Pileycerous sentinis (National Rignerock Rignerock Parn			, , , , , , , , , , , , , , , , , , , ,			
138. 25542 Milvus migrans (Black Kite) 137. 2610 Mylegia inquiete (Resilless Plycatcher) 138. 24738 Noophama Jedgrans (Elegant Parrot) 139. 24739 Noophama Jedgrans (Elegant Parrot) 140. 25564 Mylocironx caledonious (Vidus Night Horon) 141. 24407 Ooyhaga Inquirents (Clusted Pigeon) 142. 24382 Oryuma austalis (Blue-billed Duck) 143. 25680 Pachycophalia rufiventris (Rufous Whistler) 144. 24624 Pachycophalia rufiventris (Rufous Whistler) 145. Pachycophalia rufiventris subsp. rufiventris (Rufous Whistler) 146. 24628 Pachycophalia rufiventris subsp. rufiventris (Rufous Whistler) 147. 24639 Pachypalia desolatia (Anterotic Prion) 148. 24692 Pachypalia desolatia (Anterotic Prion) 149. 24693 Pachypalia desolatia (Anterotic Prion) 140. 24695 Pachypalia salvini (Salvinia Prion) 151. 24697 Pachypalia valvini (Salvinia Prion) 152. 24698 Pachypalia turu (Prior) (Prior) 153. 25691 Pardiotious punctisus (Sprated Pardalote) 154. 25692 Pardatious straius using (Sirated Pardalote) 155. 24693 Pardatious straius (Straide Pardalote) 156. 24693 Pardatious straius (Straide Pardalote) 157. 4890 Petrolechidon riginama (Straide Pardalote) 158. 4800 Petrolechidon riginama (Paulara) 159. 24693 Phaethon rufivicaus (Ries Martin) 159. 24693 Phaethon rufivicaus (Ries Martin) 150. 24698 Phalecrocorax suckinstris (Little Black Commant) 161. 24607 Phalecrocorax varius subsp. hypoleuous (Pied Commant) 162. 25699 Phalecrocorax varius subsp. hypoleuous (Pied Commant) 163. 24690 Phylocoroxx varius subsp. hypoleuous (Pied Commant) 164. 24691 Phylocoroxx varius subsp. hypoleuous (Pied Commant) 165. 24649 Photeenion audicinal (Ries tended Albaross) 17 186. 24691 Phylocoroxx varius subsp. hypoleuous (Pied Commant) 187. 25720 Platycerous surius (Riesten Rosella) 171. 25720 Platycerous surius (Riesten Rosella) 172. 24745 Platycerous surius (Riesten Rosella) 173. 24747 Platycerous surius (Riesten Rosella) 174. 25721 Platycerous surius (Riesten Rosella) 175. 24750 Platycerous surius (Riesten Rosella) 176. 24760 Platycerous surius (Riesten Rosella)		24598			IA	
138. 2510 Myingria niquista (Restlass Flyachche) 139. 24738 Neophema elegans (Elegant Parrot) 140. 25568 Nyctocrax caledonicus (Rufusu Might Heron) 141. 24430 Oxytara australia (Blue-billed Duck) P4 142. 2432 Oxytara australia (Blue-billed Duck) P4 143. 25680 Pactypapha (aphresis (Poscethe Pigeon) 144. 24624 Pactypapha (aphresis (Rufusu Whistler) 145. Pachycophala ur, Rufusu (Rufusu Whistler) 146. Pachycophala va (Rufusu Rufusu Whistler) 147. 24693 Pachypala bacheria (Flored-billed Prion) 147. 24693 Pachypala bacheria (Flored-billed Prion) 148. Pachypala bacheria (Flored-billed Prion) 149. 24695 Pachypala salvin (Sandra-billed Prion) 149. 24696 Pachypala salvin (Sandra-billed Prion) 149. 24696 Pachypala salvin (Sandra-billed Prion) 149. 24696 Pachypala salvin (Sandra-billed Prion) 150. 24696 Pachypala salvin (Sandra-billed Prion) 151. 24697 Pachypala salvin (Sandra-billed Prion) 152. Pardion cristatus 153. 25681 Pardiolus striatus (Sotted Pardialote) 154. 25698 Pardiolus striatus (Spotted Pardialote) 155. 24690 Pachypala vitatus (Sinced Pardialote) 156. 24690 Pachypala vitatus (Sinced Pardialote) 157. 48901 Petro-bildion rigificans (Tree Martin) 158. 24690 Pachypala vitatus (Sotted Pardialote) 159. 24690 Pachypala vitatus (Sotted Pardialote) 159. 24690 Pachypala vitatus (Sotted Pardialote) 151. 24697 Pachiclous striatus (Sotted Pardialote) 151. 24697 Palabacrooxa vitatus (Sotted Pardialote) 158. 24690 Pardiolus striatus Subject Robin) 159. 24690 Palabacrooxa vitatus (Sotted Pardialote) 160. 24697 Phalacrooxa vitatus (Sotted Pardialote) 161. 24697 Phalacrooxa vitatus (Sotted Pardialote) 162. 25699 Phalacrooxa vitatus (Sotted Pardialote) 163. 24698 Phalacrooxa vitatus (Part Robin) 164. 24499 Phage Schotopeter (Cormonn Orneowing) 165. 24690 Phage Schotopeter (Sotten Cormonn) 166. 24491 Phage Schotopeter (Sotten Cormonn) 167. 48001 Phylidorynis novelholiandiae (New Holland Honeyester) 168. 24690 Phylidorynis novelholiandiae (New Holland Honeyester) 169. 24491 Phage Carus subchos by Spotchilli		25542				
138. 24738 Neophema elegans (Elegant Parvol) 139. 24739 Neophema petrophila (Rock Parvol) 140. 25564 Nyctorox caledronicor (Roffusia Night Heror) 141. 24497 Ocyphaps lophotas (Cristad Pigeon) 142. 24330 Oxythaps lophotas (Cristad Pigeon) 143. 25980 Pachycophala nutiventris (Rufous Whistler) 144. 24924 Pachycophala nutiventris (Rufous Whistler) 145. Pachycophala nutiventris subsp. rufiventris (Rufous Whistler) 146. 24992 Pachypiala desolvat Indiventris (Rufous Whistler) 147. 24993 Pachypiala desolvat (Indiventic Prion) 148. 25707 Pachypiala sahimi (Sahim's Prion) 149. 24995 Pachypiala sahimi (Sahim's Prion) 149. 24995 Pachypiala sahimi subsp. mengilivrayi (Sahim's Prion) 151. 24997 Pachypiala sahimi subsp. mengilivrayi (Sahim's Prion) 151. 24997 Pachypiala utrus (Frair Prion) 151. 24997 Pachypiala utrus (Frair Prion) 151. 24997 Pachypiala utrus (Sahim's Prion) 151. 24997 Pachypiala utrus (Frair Prion) 151. 24997 Pachypiala utrus (Sahim's Prion) 152. Pandon cristatus 153. 25981 Pardiolus punctatus (Spotted Pardiolre) 154. 25982 Pardiolus striatus (Striated Pardiolre) 155. 24993 Pardiolus striatus (Striated Pardiolre) 156. 24983 Pardiolus striatus (Striated Pardiolre) 157. 48981 Perdiochidion rigicians (Free Martin) 158. 4898 Perdiochidion rigicians (Free Martin) 159. 24983 Phaeliton rubricaudis (Red-failed Tropichid) 160. 25987 Phalacrocorax cario (Great Commonnt) 161. 24987 Phalacrocorax cario (Great Commonnt) 162. 25999 Phalacrocorax varius subsp. Neotheria palpebrara (Light-mantied Albaross) 17 180. 24989 Phalacrocorax varius subsp. Diocheuros (Pied Commonnt) 181. 24999 Phalacrocorax varius subsp. Diocheuros (Pied Commonnt) 182. 24999 Phalacrocorax varius subsp. Diocheuros (Pied Commonnt) 183. 24989 Phalacrocorax varius subsp. Diocheuros (Pied Commonnt) 184. 24499 Phospheria inscella (Roy of Scotobill) 177. 25720 Palycerus internities (Wastern Rosalia) 178. 24745 Platycerus spirate (Wastern Rosalia) 179. 24745 Platycerus spirate (Wastern Rosalia) 171. 25721 Palycerus spirate (Wastern Rosalia)						
139. 24738 Neophema petrophila (Rock Parrot) 140, 25564 Nycticorax caledoricus (Rufous Night Heron)						
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143. 25880 Pachycephala rufiventris (Rufous Whistler) 144. 24624 Pachycephala suriventris (Rufous Whistler) 145. Pachycephala Suriventris (Sender-billed Prion) 147. 24833 Pachyptila belcheri (Slender-billed Prion) 148. 25707 Pachyptila Salvini Subsp. macgillivrayi (Salvin's Prion) Y 149. 24895 Pachyptila Salvini Subsp. macgillivrayi (Salvin's Prion) Y 150. 24898 Pachyptila Vering Alleria (Rufous Alleria) Y 151. 24897 Pachyptila Vering Alleria (Rufous Alleria) Y 152. Pandion crisatus Y 153. 25681 Pardiolous punctatus (Stoted Pardatote) Y 154. 25682 Pardatous striatus subsp. westraliensis (Striated Pardatote) Y 155. 24630 Pardatous striatus (Australian Pelican) Y 157. 24848 Pelecanus conspicillatus (Australian Pelican) Y 158. 42806 Pertocka boodang (Scarler Robin) P4 159. 2483 Phalactrocorax varius (Tree Martin) Y	141.					
144. 24624 Pachycephala zufwentris subsp. ruffventris (Rufous Whistler) 145. Pachycephala sp. Y 146. 24692 Pachyppilla belchen (Slender-billed Prion) Y 147. 24838 Pachyptilla desolata (Antartic Prion) Y 149. 24695 Pachyptilis salvini (Salvin's Prion) Y 150. 24697 Pachyptilis utrur (Fairy Prion) Y 151. 24697 Paradiotus striatus (Spotted Pardalote) Y 152. Paradiotus striatus (Striated Pardalote) Y 153. 25681 Paradiotus striatus subsp. meastilensis (Striated Pardalote) Y 154. 25682 Paradiotus striatus subsp. meastilensis (Striated Pardalote) Y 155. 24630 Paradiotus striatus subsp. meastilensis (Striated Pardalote) Y 155. 24631 Pelacarus conspicilitus (Australian Pelican) Y 156. 24648 Pelacarus conspicilitus (Australian Pelican) P4 159. 24653 Phaelurocorva varius (Pela Commant) P4 160. 25697 Phaelurocorva varius (P	142.	24328	Oxyura australis (Blue-billed Duck)		P4	
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147. 24693 Pachypital desolata (Antarctic Prion) 148. 25707 Pachypital sahvin (Sahvins Prion) Y 150. 24696 Pachypital surtur (Fairy Prion) Y 151. 24697 Pachypital vittata (Broad-billed Prion) Y 152. Pandion cristatus Pardalotus punctatus (Spotted Pardalote) Y 153. 25881 Pardalotus striatus (Striated Pardalote) Y 155. 24630 Pardalotus striatus (Striated Pardalote) Y 155. 24630 Pardalotus striatus (Striated Pardalote) Y 156. 24648 Pelocanius conspicillatus (Australian Pelican) Y 157. 48061 Petrochelidon ingircans (Tree Martin) Y 158. 48066 Petrochelidon indigenas (Tree Martin) P4 159. 24653 Phaelorocorax carbo (Great Commont) P4 160. 25697 Phalecrocorax varius (Fed Commont) Y 161. 24667 Phalecrocorax varius subsp. hypoleucos (Pied Commant) Y 162. 25699 Phalecrocorax varius (Pied						Υ
148. 25707 Pachyptila salvini (Salvin's Prion) Y 149. 24695 Pachyptila salvini subsp. macgillivrayi (Salvin's Prion) Y 150. 24696 Pachyptila turtur (Fairy Prion) *** 151. 24697 Pachyptila turtur (Fairy Prion) *** 152. Pandion cristatus *** 153. 25681 Pardalotus punctatus (Spotted Pardalote) *** 154. 25682 Pardalotus striatus subsp. westraliensis (Striated Pardalote) *** 155. 24630 Pardalotus striatus subsp. westraliensis (Striated Pardalote) *** 156. 24648 Pelecanus conspicillatus (Australian Pelican) *** 157. 48001 Petroica boodang (Scarlet Robin) *** 159. 24663 Phalacrocorax cardinal (Australian Pelican) *** 160. 25697 Phalacrocorax varius (Fed-tailed Tropicbird) *** 161. 24667 Phalacrocorax varius (Fed-tailed Tropicbird) *** 162. 25699 Phalacrocorax varius subsp. hypoleucos (Pied Cormorant) *** 163.						
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18.8. 24777 Prosections (Secretary Charles)	186.	24769	Porzana fluminea (Australian Spotted Crake)			
190. 24733 Primitivania managorea (Carest-Vision Princip)	187.	25732	Porzana pusilla (Baillon's Crake)			
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200. 24/46 Suppringiver acutal (Ned-eared Firetal)	198.	24279	Sericornis frontalis subsp. maculatus (White-browed Scrubwren)			
201. 48118 Sercoranius antencinius (Brown Skaa) 14.	199.	30948	Smicrornis brevirostris (Weebill)			
2022						
203. 24309 Sictionette neerocia (Frechled Duck) 204. 2865 Sighturus malachurus ubspa, westernensis (Southern Emu-wern) 205. 24564 Sighturus malachurus ubspa, westernensis (Southern Emu-wern) 206. 25690 Stropturus variation (Frechled Lughing Turin-Dove) 207. 25690 Stropturus asregionets (Lughing Turin-Dove) 208. 25705 Tarbybaptus noveabnollandiae (Australasian Greba, Black-throated Grabe) 209. 24331 Takaran denorincies (Australasian Greba, Black-throated Grabe) 210. 24310 Tarbassarche carten (Indian Yallow-neoad Abatosis) 211. Tarbassarche aren (Indian Yallow-neoad Abatosis) 212. 44313 Tarbassarche aren (Indian Yallow-neoad Abatosis) 213. 24845 Trechmin sphricollis (Florave neoad Abatosis) 214. 25549 Todiramphus sanchus (Sacred Kingfishar) 215. 45117 Tibrary ventralis (Black-bland Yallow-harin) 216. 24800 Trings inchiedis (Common Greenstank) 217. 24800 Trings inchiedis (Common Greenstank) 218. 24800 Trings inchiedis (Common Greenstank) 219. 45117 Turix vanus (Palatied Sutton-quali) 220. 24805 Trings inchiedis (Common Greenstank) 221. 24805 Trings inchiedis (Grommon Greenstank) 222. 24805 Trings inchiedis (Grommon Greenstank) 223. 24305 Vanushus mooker (Banded Lapwing) 224. 24805 Trings inchiedis subapo (inchiedis (Bandow)) 225. 277 Acarthaluteres singer 226. Acarthaluteres singer 227. Acarthaluteres singer 228. Acarthaluteres singer 229. Anopogon ineppelli 231. Aseragodos haaksanas 232. Anterincoma pa. 233. Austrobinium sanchus 234. Bostockia porusa 235. Brachaluteres jankaonianus 236. Cambridosim subasus 237. Cambridosim subasus 238. Cambridosim subasus 239. Carabssa gurutus 241. Catodinium sanchus 242. Chentomas panchus 243. Chentomas panchus 244. Chentomas panchus						
204. 25655 Siphurus malachurus autop, westermensis (Southen Emu-weren)					IA	
2456						
205. 25597 Stepproe versicolor (Gery Currasonar) Y						
207. 2550 Steptpoplois amospialnesis (Laughing Turtie-Cove) Y						
209. 24331 Tadorna tadomoidos (Australian Shelduck, Mountain Duck)				Υ		
210. 34134 Thabassarche carter (Indian Yellow-nosed Albatross) T	208.	25705	Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)			
211. Thelesseus bergil 212. 48135 Thiromins unbinolitis (Hooded Plover, Hooded Dotterel) P4	209.	24331	Tadorna tadornoides (Australian Shelduck, Mountain Duck)			
212.	210.	34134	Thalassarche carteri (Indian Yellow-nosed Albatross)		Т	
213. 24845 Threskiomis spinicallis (Straw-necked bits) 214. 25549 Todiramphus senctus (Sacred Kinglisher) 215. 48141 Tribny ventrals (Slecked Kinglisher) 216. 24806 Tringa glareola (Wood Sandpiper) 217. 24808 Tringa glareola (Wood Sandpiper) 218. 24808 Tringa stepation (Common Greenshank, greenshank) 219. 48147 Trunix varius (Painted Button-quali) 220. 24852 Tyto novaehollandiae subsp. novaehollandiae (Masked Owl (southwest)) 221. 24855 Tyto novaehollandiae subsp. novaehollandiae (Masked Owl (southwest)) 222. 25577 Vanallus miles (Masked Lapwing) 223. 24380 Vanallus sinciae (Sanded Lapwing) 224. 25765 Zosterops lateralis (Grey-breasted White-eye, Silvereye) Fish 225. 7? 226. Acanthaluteras spinonelanuus 227. Acanthaluteras spinonelanuus 228. Acanthaluteras spinonelanuus 229. Anoplocapros robustus 230. Apogon nappelii 231. Aseragodes haackeanus 232. Atherinosama sp. 233. Austrolabrus maculatus 234. Bostockia porosa 235. Brachaluteres jacksonianus 236. Bram burma 237. Cantheschenia longipinnis 238. Caprichthys gurmura 249. Cacharhusus browlpina 240. Cacharhusus browlpina 241. Cetorhimus maximus 242. Cheatodomis penicilligera 243. Chelidonichtys kurnu 244. Chelmonops curiosus 245. Cirrimureena calamus	211.		Thalasseus bergii			
214. 25549 Todiramphus sanctus (Sacred Kingfisher) 215. 43141 Tibonyx ventralis (Black-tailed Mative-hen)					P4	
215.						
216. 24806 Tringa glareola (Wood Sandpiper) IA						
217. 24808 Tringa nebularia (Common Greenshank, greenshank) 218. 24809 Tringa stagnaliis (Marsh Sandpiper, little greenshank) 219. 48147 Truink varius (Fanter Button-quail) 220. 24852 Tyto novaehollandiae subsp. novaehollandiae (Masked Owl (southwest)) 221. 24855 Tyto novaehollandiae subsp. novaehollandiae (Masked Owl (southwest)) 222. 25577 Vanelius miles (Masked Lapwing) 223. 24386 Vanellius tricotor (Banded Lapwing) 224. 25765 Zosterops lateralis (Grey-breasted White-eye, Silvereye) Fish 225. ? ? 226. Acanthaluteres brownii 227. Acanthaluteres syliomelantrus 228. Acanthaluteres vittiger 229. Anoplo-zapros robustus 230. Apogon rueppellii 231. Aseraggodes haackeanus 232. Atherinosoma sp. 233. Austrolabrus maculatus 234. Bostockia porosa 235. Brachaluteres gicksonianus 236. Brama brama 237. Cantheschenia longipinnis 238. Caprichthys gymnura 239. Carassius suratus 240. Cerchantinus brevipinna 241. Cetothnus maximus 242. Chaetodemis pencilligera 243. Chelidonichthys kumu 244. Chelmonops curiosus 245. Cirrhimuraena calamus					IA	
218. 24809 Tringa stagnatilis (Marsh Sandpiper, little greenshank) IA 219. 48147 Turnix varius (Palinted Button-quail) 220. 24852 Tyto alba subsp. eleicatula (Bam Owl) 221. 24855 Tyto novaehollandiae subsp. novaehollandiae (Masked Owl (southwest)) 222. 25577 Vanellus miles (Masked Lapwing) 223. 24386 Vanellus tricolor (Banded Lapwing) 224. 25765 Zosterops lateralis (Grey-breasted White-eye, Silvereye) Fish 225. 7? 226. Acanthaluteres brownil 227. Acanthaluteres syllomelanurus 228. Acanthaluteres vittiger 229. Anoplocapros robustus 230. Apogon rueppellii 231. Aseraggodes haackeanus 232. Atherinosoma sp. 233. Austrolabrus maculatus 234. Bostocka porosa 235. Brachaluteres jacksonianus 236. Brama brama 237. Cantheschenia longipinnis 238. Caprichthys gymnura 239. Carassius auratus 240. Carcharinus brovipinna 241. Celorhinus maximus 242. Cheetodermis penicilligera 243. Cheldonichthys kumu 244. Chelmonops curiosus 245. Cirrhimuraena calamus						
219. 48147 Turnix varius (Painted Button-quail) 220. 24852 Tyto alta subsp. delicatula (Barn Owl) 221. 24855 Tyto novalenbliandiae subsp. novaehollandiae (Masked Owl (southwest)) 222. 25577 Vanellus miles (Masked Lapwing) 223. 24366 Vanellus tricolor (Banded Lapwing) 224. 25765 Zosterops lateralis (Grey-breasted White-eye, Silvereye) Fish 225. ?? 226. Acanthaluteres brownii 227. Acanthaluteres spllomelanurus 228. Acanthaluteres vittiger 229. Anoplocapros robustus 230. Apogon rueppellii 231. Aseraggodes haackeanus 232. Atherinosoma sp. 233. Austrolabrus maculatus 234. Bostockia porosa 235. Brachaluteres jacksonianus 236. Brama brama 237. Cantheschenia longipinnis 238. Caprichthys gymnura 239. Carassius auratus 240. Carcharhius brevipinna 241. Cetorhirus maximus 242. Cheatodermis peniciliigera 243. Chelidonichthys kumu 244. Chelmonops curiosus 245. Girthimuraena calamus						
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223. 24386 Vanellus tricolor (Banded Lapwing) 224. 25765 Zosterops lateralis (Grey-breasted White-eye, Silvereye) Fish 225. ?? 226. Acanthaluteres brownii 227. Acanthaluteres spilomelanurus 228. Acanthaluteres vittiger 229. Anoplocapros robustus 230. Apogon rueppellii 231. Aseraggodes haackeanus 232. Atherinosoma sp. 233. Austrolabrus maculatus 234. Bostockia porosa 235. Brachaluteres jacksonianus 236. Brama brama 237. Cantheschenia longipinnis 238. Caprichthys gymnure 239. Carassius auratus 239. Carassius auratus 240. Carcharhinus brevipinna 241. Cetorhinus maximus 242. Cheidooinchthys kumu 243. Chelidonichthys kumu 244. Chelmonops curiosus 245. Cirrhimuraena calamus	221.	24855	Tyto novaehollandiae subsp. novaehollandiae (Masked Owl (southwest))		P3	
Fish 225. ?? 226. Acanthaluteres brownii 227. Acanthaluteres spilomelanurus 228. Aanthaluteres vittiger 229. Anoplocapros robustus 230. Apogon rueppellii 231. Aseraggodes haackeanus 232. Atherinosoma sp. 233. Austrolabrus maculatus 234. Bostockia porosa 235. Brachaluteres jacksonianus 236. Brama brama 237. Cantheschenia longipinnis 238. Caprichitys gymnura 239. Carassius auratus 240. Carchathinus brevipinna 241. Cetorhinus maximus 242. Chaetodermis penicilligera 243. Chelidonichitys kumu 244. Chelmonops curiosus 245. Cirrhimuraena calamus		25577	Vanellus miles (Masked Lapwing)			
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226. Acanthaluteres brownii 227. Acanthaluteres spilomelanurus 228. Acanthaluteres vittiger 229. Anoplocapros robustus 230. Apogon rueppellii 231. Aseraggodes haackeanus 232. Atherinosoma sp. 233. Austrolabrus maculatus 234. Bostockia porosa 235. Brachaluteres jacksonianus 236. Brama brama 237. Cantheschenia longipinnis 238. Caprichthys gymnura 239. Carassius auratus 240. Carcharhinus brevipinna 241. Cetorhinus maximus 242. Chaetodermis penicilligera 243. Chelidonichthys kumu 244. Chelmonops curiosus 245. Cirrhimuraena calamus	Fish					
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229. Anoplocapros robustus 230. Apogon rueppellii 231. Aseraggodes haackeanus 232. Atherinosoma sp. 233. Austrolabrus maculatus 234. Bostockia porosa 235. Brachaluteres jacksonianus 236. Brama brama 237. Cantheschenia longipinnis 238. Caprichthys gymnura 239. Carassius auratus 240. Carcharhinus brevipinna 241. Cetorhinus maximus 242. Chaetodermis penicilligera 243. Chelidonichthys kumu 244. Chelmonops curiosus 245. Cirrhimuraena calamus						
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235. Brachaluteres jacksonianus 236. Brama brama 237. Cantheschenia longipinnis 238. Caprichthys gymnura 239. Carassius auratus 240. Carcharhinus brevipinna 241. Cetorhinus maximus 242. Chaetodermis penicilligera 243. Chelidonichthys kumu 244. Chelmonops curiosus 245. Cirrhimuraena calamus						
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238. Caprichthys gymnura 239. Carassius auratus 240. Carcharhinus brevipinna 241. Cetorhinus maximus 242. Chaetodermis penicilligera 243. Chelidonichthys kumu 244. Chelmonops curiosus 245. Cirrhimuraena calamus	236.		Brama brama			
239. Carassius auratus 240. Carcharhinus brevipinna 241. Cetorhinus maximus 242. Chaetodermis penicilligera 243. Chelidonichthys kumu 244. Chelmonops curiosus 245. Cirrhimuraena calamus	237.		Cantheschenia longipinnis			
240. Carcharhinus brevipinna 241. Cetorhinus maximus 242. Chaetodermis penicilligera 243. Chelidonichthys kumu 244. Chelmonops curiosus 245. Cirrhimuraena calamus						
241. Cetorhinus maximus 242. Chaetodermis penicilligera 243. Chelidonichthys kumu 244. Chelmonops curiosus 245. Cirrhimuraena calamus						
242. Chaetodermis penicilligera 243. Chelidonichthys kumu 244. Chelmonops curiosus 245. Cirrhimuraena calamus			·			
243. Chelidonichthys kumu 244. Chelmonops curiosus 245. Cirrhimuraena calamus						
244. Chelmonops curiosus 245. Cirrhimuraena calamus						
245. Cirrhimuraena calamus						
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	Name ID	Species Name N.	laturalised	Conservation Code	¹ Endemic To Query
246.		Cleidopus gloriamaris			Area
247.		Cochleoceps viridis			
248.		Coryphaena hippurus			
249.		Cristiceps aurantiacus			
250.		Cristiceps australis			
251.		Diodon nicthemerus			
252.		Dotalabrus aurantiacus			
253.		Echeneis naucrates			
254.		Edelia vittata			
255.		Elops hawaiensis			
256.					
	34028	Eubalichthys cyanoura Calavias accidentalis (Wastern Minnau)			
257. 258.	34026	Galaxias occidentalis (Western Minnow) Gambusia affinis			
259.					
		Gambusia holbrooki			
260.		Genypterus blacodes			
261.	24020	Genypterus tigerinus		D4	
262.	34030	Geotria australis (Pouched Lamprey)		P1	
263.		Gnathanodon speciosus			
264.		Gnathophis longicaudatus			
265.		Gonorynchus greyi			
266.		Gymnapistes marmoratus			
267.		Haletta semifasciata			
268.		Halichoeres brownfieldi			
269.		Helcogramma decurrens			
270.		Heteroclinus adelaidae			
271.		Heteroclinus sp.			
272.		Hypnos monopterygium			
273.		Ichthyscopus barbatus			
274.		Lactoria cornuta			
275.		Lagocephalus sceleratus			
276.		Lotella rhacinus			
277.		Meuschenia freycineti			
278.		Meuschenia galii			
279.		Nannoperca vittata			
280.		Omegophora cyanopunctata			
281.		Ophichthus melanochir			
282.		Ophisurus serpens			
283.		Pagrus auratus			
284.		Parablennius postoculomaculatus			
285.		Parablennius sp.			
286.		Parapercis haackei			
287.		Parascyllium variolatum			
288.		Perca fluviatilis			
289.		Phyllophryne scortea			
290.		Phyllopteryx taeniolatus			
291.		Posidonichthys hutchinsi			
292.		Pristiophorus nudipinnis			
293.		Pseudogobius olorum			
294.		Pterygotrigla polyommata			
295.		Rachycentron canadum			
296.		Ranzania laevis			
297.		Regalecus glesne			
298.		Sarda orientalis			
299.		Scobinichthys granulatus			
300.		Sillaginodes punctata			
301.		Siphamia cephalotes			
302.		Siphonognathus argyrophanes			
303.		Siphonognathus radiatus			
304.		Squatina australis			
305.		Stigmatopora argus			
306.		Tetrapturus audax			Υ
307.		Thunnus alalunga			
308.		Thunnus maccoyii			
309.		Trachinops noarlungae			
310.		Vanacampus poecilolaemus			
311.		Vincentia punctata			
Invertebrate	e				
312.		Acariformes sp.			
313.		Acarina sp.			
314.		Aeshnidae sp.			
		NatureMan is a collaborative project of the Department of Parks and Wildlife and the Western A		Department Parks and V	of wildlife muse







15.5 Aprilipor Implivation	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
316. Америкурили поливе 317. Алейонития изакатамам 318. Алейонития изакатамам 319. Алейонития Алейонития 320. Алейонития Алейонития 321. Алейонития Алейонития 322. Алейонития Алейонития 323. Алейонития Алейонития 324. Алейонития Алейонития 325. Алейонития Алейонития 326. Алейонития Алейонития 327. Алейонития Алейонития 328. Алейонития Алейонития 329. Алейонития Алейонития 329. Алейонития Алейонития 320. Алейонития Алейонития 321. Алейонития Алейонития 322. Алейонития Алейонития 323. Алейонития 334. Алейонития 335. Алейонития 346. Алейонития 347. Алейонития 348. Алейонития 349. Алейонития 340. Алейонития 341. Валичития Алейонития 342. Алейонития 343. Алейонития 344. Валичития Алейонития 345. Алейонития 346. Валичития Алейонития 347. Валичития Алейонития 348. Валичития Алейонития 349. Валичития Алейонития 340. Валичития Алейонития 341. Валичития Алейонития 342. Валичития Алейонития 343. Валичития Алейонития 344. Валичития Алейонития 345. Валичития Алейонития 346. Валичития Алейонития 347. Валичития Алейонития 348. Валичития Алейонития 349. Валичития Алейонития 340. Валичития Алейонития 341. Валичития Алейонития 342. Валичития Алейонития 343. Валичития Алейонития 344. Валичития Алейонития 345. Валичития Алейонития 346. Валичития Алейонития 347. Валичития Алейонития 348. Валичития Алейонития 349. Валичития Алейонития 340. Валичития Алейонития 341. Валичития Алейонития 342. Валичития Алейонития 343. Валичития Алейонития 344. Валичития Алейонития 345. Валичития Алейонития 346. Валичития Алейонития 347. Валичития Алейонития 348. Валичития Алейонития	315.	Aganippe rhaphiduca			
318	316.				
319	317.	Amblyomma albolimbatum			
20.0 Acey offices ap	318.	Aname mainae			
Sect. Analogue as	319.	Aname tepperi			
302. Antificioria (Incinoria)	320.	Ancylidae sp.			
323. Antiponos formorals 324. Antiponos formorals 325. Antiponos formorals 326. Antiponos formorals 327. Antiponos formorals 328. Antiponos formorals 329. Antiponos formorals 320. Antiponos formorals 330. Antiponos formorals 331. Antiponos formorals 331. Antiponos formorals 332. Antiponos formorals 333. Antiponos formorals 334. Antiponos formorals 335. Antiponos formorals 336. Antiponos formorals 337. Antiponos formorals 338. Antiponos formorals 339. Antiponos formorals 330. Antiponos formorals 331. Antiponos formorals 332. Antiponos formorals 333. Antiponos formorals 334. Antiponos formorals 335. Antiponos formorals 336. Antiponos formorals 337. Antiponos formorals 338. Antiponos formorals 340. Gastrocouris formorals 341. Genous municiponos 342. Genous municiponos 343. Genous municiponos 344. Genous municiponos 345. Centrologo genomica	321.	Anisops sp.			
326. Anipotous agus	322.	Antichiropus nanus			
395. Amontonia Registrat	323.	Antiporus femoralis			
256. Animose acquirementals	324.	Antiporus sp.			
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349. Ceratopogonidae sp. 350. Cercophonius suicatus 351. Cherax destructor 352. Cherax priessii 353. Cherax quimquecarinatus 354. Chironominae sp. 355. Chironomus aff. alternans (V24) (CB) 356. Chironomus aff. alternans (V24) (CB) 357. Chrysomelidae sp. 358. Cyroits severus 359. Coenagrionidea sp. 360. Copepoda sp. 361. Cortiliidae sp. 362. Cerixidea sp. 363. Cormocephalus aurantiipes 364. Corynoneura sp. (V49) (SAP) 365. Ciclotopus [articintus' 366. Culax (Culex) australicus 367. Culicidae sp. 368. Cyrlosa triobata 370. Cyrlosa triobata 371. Directerdijees sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biagicata 375. Eriophora permasie </td <td>347.</td> <td>Caenidae sp.</td> <td></td> <td></td> <td></td>	347.	Caenidae sp.			
350. Cercophonius sulcatus 351. Cherax destructor 352. Cherax preissii 353. Cherax quinquearinatus 354. Chironominae sp. 355. Chironomus aff. alternas (V24) (CB) 356. Chironomus spperi 357. Chryonelidae sp. 358. Clynois severus 359. Coenagrionidae sp. 360. Corpoda sp. 361. Cortulidae sp. 362. Corhidae sp. 363. Cornocephalus aurantiipes 364. Coryoneura sp. (V49) (SAP) 365. Critootpus particularus 366. Cidlex (Culex) australicus 367. Cidicidae sp. 368. Cyclosa trilobata 369. Cyclosa trilobata 360. Cyclosa inlobata 361. Cortucidae sp. 362. Corhidae sp. 363. Cidlex (Culex) australicus 364. Coryoneura sp. (V49) (SAP) 365. Critootpus particularus 366. Cyclosa rilobata 367. Culicidae sp. 370. Cyclosa inlobata 370. Cyclosa inlobata 371. Dicrotendipes sp. A (V47) (SAP) 372. Dyriscidae sp. 373. Ecnomidae sp. 374. Eiophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarpus taylori 378. Gengarpus taylori 378. Gengarpus taylori 379. Girjopterygidee sp. 379. Girjopterygidee sp. 379. Girjopterygidee sp. 381. Harrisius sp. (SFM) Helochares terulistriatus	348.	Ceinidae sp.			
351. Cherax destructor 352. Cherax priesisi 353. Charax quinquecarinatus 354. Chironomus esp. 355. Chironomus etaperi 357. Chysomelidae sp. 358. Clyrotis severus 359. Coenagrionidee sp. 360. Copepoda sp. 361. Cortuliidee sp. 362. Corrividee sp. 363. Cormocephalus aurantiipes 364. Corproneura sp. (V49) (SAP) 365. Cricotopus 'parlicincus' 366. Culox (Culex) Jaustralicus 367. Culicidae sp. 368. Cyclosa trilobata 369. Cyrtophora parmasia 370. Cytostethum tasmaniense Y 371. Dicrotendpes sp. 4 (V47) (SAP) 372. Dytiscidae sp. 373. Eromidee sp. 375. Eriophora biapicata 375. Eriophora pisuliosa 376. Gelastocoridae sp. 377. Geogarypus taylori	349.	Ceratopogonidae sp.			
352. Cherax priessii 353. Cherax quinquearinatus 354. Chironomisa sp. 355. Chironomisa sp. 356. Chironomis aff. alternans (V24) (CB) 356. Chironomis tepperi 357. Chysomelidae sp. 358. Clynotis severus 359. Coenagrionidae sp. 360. Copepoda sp. 361. Cordulidae sp. 362. Corividae sp. 362. Corividae sp. 363. Cormocephalus aurantiipes 364. Corproneura sp. (V49) (SAP) 365. Cricotopus particinicus' 366. Culex (Culex) australicus 367. Culicidae sp. 368. Cyclosa trilotata 369. Cyrtophora parnasia 370. Cytostethum tasmaniense y 371. Dicrotendipes sp. A (V47) (SAP) 372. Dyfiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora biapicata 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Genphylidae sp. 379. Gripoplerygidae sp. 379. Harrislus sp. B(SFM) 379. Helochares tenuistriatus	350.	Cercophonius sulcatus			
353. Cherax quinquecarinatus 354. Chironomina sp. 355. Chironomia sf. alemans (V24) (CB) 356. Chironomia sf. alemans (V24) (CB) 357. Chysomelidae sp. 358. Chynois severus 359. Coanagrionidae sp. 360. Copepoda sp. 361. Corduidae sp. 362. Corixidae sp. 363. Comocephalus aurantiipes 364. Corynoneura sp. (V49) (SAP) 365. Cricotopus 'particinctus' 366. Culex (Culex) australicus 367. Culicidae sp. 368. Cyclosa trilobata 369. Cyrtophora parasia 369. Cyrtophora parasia 370. Cylostethum tamaniense 371. Dicrotendipas sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Eononidae sp. 374. Eriophora biapicata 375. Eriophora biapicata 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gengheidee sp. 379. Gippoterygidae sp. 370. Geogarypus taylori 371. Harrisius sp. (SFM) 372. Helochares teruistriatus	351.	Cherax destructor			
354. Chironominae sp. 355. Chironomus tepperi 357. Chrysomelidae sp. 358. Clynois severus 359. Coanagrionidae sp. 360. Copepoda sp. 361. Cordulidae sp. 362. Corividae sp. 363. Cormoephalus aurantiipes 364. Coryoneura sp. (V49) (SAP) 365. Cricotopus parbicinctus' 366. Culex (Culex) australicus 367. Culicidae sp. 368. Cyclosa tribabata 370. Cytostethum tasmaniense 371. Dicrotendijees sp. A (V47) (SAP) 372. Dytiscidee sp. 373. Ecnomidee sp. 374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarpust tarylori 378. Gomphidae sp. 379. Gripoptergijdee sp. 380. Gyrinidae sp. 381. Harrisius sp. 8 (SFM) 382. Harrisius sp. 8 (SFM)	352.	Cherax preissii			
355. Chironomus aff. alternans (V24) (CB) 356. Chironomus tepperi 357. Chrysomelidae sp. 358. Clynotis severus 359. Coenagrionidae sp. 360. Copepoda sp. 361. Cordillidae sp. 362. Corividae sp. 363. Cormocephalus aurantilipes 364. Corynoneura sp. (V49) (SAP) 365. Cricotopus 'parhicinctus' 366. Culex (Culex) australicus 367. Cullicidae sp. 368. Cyclosa trilobata 369. Cyrtophora parnasia 370. Cytostethum tasmaniense 371. Dicrotendipes sp. A (V47) (SAP) 372. Dyriscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora biapicata 376. Gelastocoridae sp. 377. Geogarpus taylori 378. Gomphidae sp. 379. Gripotergidae sp. 370. Gripotergidae sp. 371. Gerpotrapistulosa 372. Printing a completae sp. 373. Ending a completae sp. 374. Eriophora pistulosa 375. Eriophora pistulosa 376. Gelastocoridae sp. 377. Geogarpus taylori 378. Gomphidae sp. 379. Gripotergidae sp. 380. Gyrinidae sp. 381. Harrisius sp. B(SFM) 382. Harrisius sp. B(SFM) 383. Helocheres tenuistriatus	353.	Cherax quinquecarinatus			
356. Chironomus tepperi 357. Chrysomelidae sp. 358. Cyrnois severus 359. Coenagrionidae sp. 360. Copepoda sp. 361. Cordulidae sp. 362. Corixidee sp. 363. Cormocephalus aurantiipes 364. Corynoneura sp. (V49) (SAP) 365. Criotopus 'particinetus' 366. Culex (Culex) australicus 367. Culicidae sp. 388. Cyclosa trilobata 369. Cyrtophora pamasia 370. Cytostethum tasmaniense Y 371. Dicrotendipes sp. A (V47) (SAP) 372. Dyiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora biapicata 376. Gelastocoridae sp. 377. Geogaryus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harristus sp. B(SFM)	354.	Chironominae sp.			
357. Chrysomelidae sp. 358. Clynotis severus 359. Coenagrionidae sp. 360. Copepoda sp. 361. Cordullidae sp. 362. Corixidae sp. 363. Cormocephalus aurantiipes 364. Corynoneura sp. (V49) (SAP) 365. Cricotopus 'parbicinctus' 366. Culex (Culex) australicus 367. Culicidae sp. 368. Oyclosa trilobata 369. Cyrtophora parmasia 370. Cyrtostehum tasmaniense y 371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora piapicata 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gonphidae sp. 379. Gripopterygidae sp. 379. Gripopterygidae sp. 379. Gripopterygidae sp. 379. Gripopterygidae sp. 371. Harrisius sp. 381. Harrisius sp. 382. Harrisius sp. (SFM) 383. Helochares tenuistriatus	355.	Chironomus aff. alternans (V24) (CB)			
358. Clynotis severus 359. Coenagrionidae sp. 360. Copepoda sp. 361. Cordulidae sp. 362. Corixidae sp. 363. Cormocephalus aurantiipes 364. Corynoneura sp. (V49) (SAP) 365. Cricotopus 'parbicinctus' 366. Culex (Culex) australicus 367. Culicidae sp. 368. Cyclosa trilobata 369. Cyrtophora parnasia 370. Cytostethum tasmaniense 370. Cytostethum tasmaniense 371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora biapicata 376. Gelastocoridae sp. 377. Geogapyus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. B (SFM) 382. Harrisius sp. B (SFM)	356.	Chironomus tepperi			
359. Coenagrionidae sp. 360. Copepoda sp. 361. Cordulliidae sp. 362. Corixidae sp. 363. Cormocephalus aurantiipes 364. Corynoneura sp. (V49) (SAP) 365. Cricotopus 'parbicinctus' 366. Culex (Culex) australicus 367. Culicidae sp. 368. Cyclosa trilobata 369. Cyrtophora parnasia 370. Cytostethum tasmaniense 371. Dicrotendipes sp. A (V47) (SAP) 372. Dyfiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gripoptenygidae sp. 379. Gripoptenygidae sp. 379. Gripoptenygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	357.	Chrysomelidae sp.			
360. Copepoda sp. 361. Cordulidae sp. 362. Corixidae sp. 363. Cormocephalus aurantiipes 364. Corynoneura sp. (V49) (SAP) 365. Cricotopus 'parbicinctus' 366. Culex (Culex) australicus 367. Culicidae sp. 368. Cyclosa trilobata 369. Cyrtophora parnasia 370. Cytostethum tasmaniense 371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Girjopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	358.	Clynotis severus			
361. Cordulidae sp. 362. Corixidae sp. 363. Cormocephalus aurantiipes 364. Corynoneura sp. (V49) (SAP) 365. Cricotopus 'parbicinctus' 366. Culex (Culex) australicus 367. Culicidae sp. 368. Cyclosa trilobata 369. Cyrtophora parnasia 370. Cytostethum tasmaniense 371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora biapicata 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gorphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	359.	Coenagrionidae sp.			
362. Corixidae sp. 363. Cormocephalus aurantiipes 364. Corynoneura sp. (V49) (SAP) 365. Cricotopus 'parbicinctus' 366. Culex (Culex) australicus 367. Culicidae sp. 368. Cyclosa trilobata 369. Cytrophora parnasia 370. Cytostethum tasmaniense 371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora piapicata 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gipopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. B (SFM) 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	360.	Copepoda sp.			
363. Cormocephalus aurantiipes 364. Corynoneura sp. (V49) (SAP) 365. Cricotopus 'parbicinctus' 366. Culex (Culex) australicus 367. Culicidae sp. 368. Cyclosa trilobata 369. Cyrtophora parnasia 370. Cytostethum tasmaniense Y 371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora biapicata 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. B (SFM) 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	361.	Corduliidae sp.			
364. Corynoneura sp. (V49) (SAP) 365. Cricotopus 'parbicinctus' 366. Culex (Culex) australicus 367. Culicidae sp. 368. Cyclosa trilobata 369. Cyrtophora parnasia 370. Cytostethum tasmaniense Y 371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. (SFM) 383. Helochares tenuistriatus	362.	Corixidae sp.			
365. Cricotopus 'parbicinctus' 366. Culex (Culex) australicus 367. Culicidae sp. 368. Cyclosa trilobata 369. Cyrtophora parnasia 370. Cytostethum tasmaniense y 371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gonphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	363.	Cormocephalus aurantiipes			
366. Culex (Culex) australicus 367. Culicidae sp. 368. Cyclosa trilobata 369. Cyrtophora parnasia 370. Cytostethum tasmaniense Y 371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geograpyus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	364.	Corynoneura sp. (V49) (SAP)			
367. Culicidae sp. 368. Cyclosa trilobata 369. Cyrtophora parnasia 370. Cytostethum tasmaniense y 371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	365.	Cricotopus 'parbicinctus'			
368. Cyclosa trilobata 369. Cyrtophora parnasia 370. Cytostethum tasmaniense Y 371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	366.	Culex (Culex) australicus			
369. Cyrtophora parnasia 370. Cytostethum tasmaniense Y 371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	367.	Culicidae sp.			
370. Cytostethum tasmaniense Y 371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	368.	Cyclosa trilobata			
371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	369.	Cyrtophora parnasia			
371. Dicrotendipes sp. A (V47) (SAP) 372. Dytiscidae sp. 373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	370.	Cytostethum tasmaniense			Υ
373. Ecnomidae sp. 374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	371.	Dicrotendipes sp. A (V47) (SAP)			
374. Eriophora biapicata 375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	372.	Dytiscidae sp.			
375. Eriophora pustulosa 376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	373.	Ecnomidae sp.			
376. Gelastocoridae sp. 377. Geogarypus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	374.	Eriophora biapicata			
377. Geogarypus taylori 378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	375.	Eriophora pustulosa			
378. Gomphidae sp. 379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	376.	Gelastocoridae sp.			
379. Gripopterygidae sp. 380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	377.	Geogarypus taylori			
380. Gyrinidae sp. 381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	378.	Gomphidae sp.			
381. Harrisius sp. 382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	379.	Gripopterygidae sp.			
382. Harrisius sp. B (SFM) 383. Helochares tenuistriatus	380.	Gyrinidae sp.			
383. Helochares tenuistriatus	381.	Harrisius sp.			
	382.	Harrisius sp. B (SFM)			
384. Helpis minitabunda	383.	Helochares tenuistriatus			
· · · · · · · · · · · · · · · · · · ·	384.	Helpis minitabunda			







Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
385.	Hemicorduliidae sp.			
386.	Henicops dentatus			
387.	Heurodes turritus			
388.	Hydraenidae sp.			
389.	Hydrobiosidae sp.			
390.	Hydrophilidae sp.			
391.	Hydroptilidae sp.			
392.	Hyriidae sp.			
393.	Insulodrilus bifidus			
394.	Isopeda leishmanni			
395.	Isopedella cana			
396.	Kiefferulus intertinctus			
397.	Lampona cylindrata			
398.	Lampona punctigera			
399.	Lancetes lanceolatus			
400.	Latrodectus hasseltii			
401.	Leptoceridae sp.			
402.	Leptoperla australica			
403.	Leptophlebiid genus S sp. AV1			
404.	Leptophlebiidae sp.			
405.	Lestidae sp.			
406.	Libellulidae sp.			
407.	Limbodessus inornatus			
408.	Limnophyes vestitus (V41)			
409.	Limnoxenus zelandicus			
410.	Maratus pavonis			
411.	Megapodagrionidae sp.			
412.	Micronecta robusta			
413.	Microvelia sp.			
414.	Missulena granulosa			
415.	Missulena occatoria			
416.	Mituliodon tarantulinus			
417.	Nephila edulis			
418.	Newmanoperla exigua			
419.	Notonectidae sp.			
420.	Nousia sp. AV16			
421.	Nunciella aspera			
422.	Ocrisiona parmeliae			
423.	Oligochaeta sp.			
424.	Ommatoiulus moreletii			
425.	Opisthopora sp.			
426.	Oratemnus curtus			
427.	Orthocladiinae sp.			
428.	Ostracoda (unident.)			
429.	Palaemonidae sp.			
430.	Paracymus sp.			
431.	Paracymus spenceri			
432.	Parakiefferiella variegatus			
433.	Paralimnophyes pullulus (V42)			
434.	Paramerina levidensis			
435.	Parastacidae sp.			
436.	Pentaneurini genus V20			
437.	Perthiidae sp.			
438.	Philopotamidae sp.			
439.	Phreatoicidae sp.			
440.	Phreodrilidae sp.			
441.	Planorbidae sp.			
442.	Platynectes decempuntatus var polygrammus			
443.	Platynectes sp.			
444.	Polypedilum nr. convexum (SAP)			
445.	Polypedilum watsoni			
446.	Protoneuridae sp.			
447.	Pyralidae sp.			
448.	Raveniella peckorum			
449.	Rhantus sp.			
450.	Rhantus suturalis			
451.	Richardsonianidae sp.			
452.	Riethia v5			
453.	Scirtidae sp.			
454.	Simuliidae sp.			
			Department	of molecular







	Name ID	Species Name	Naturalised	Conservation Code	Endemic To Que Area
455.		Staphylinidae sp.			
456.		Sternopriscus browni			
457.		Sternopriscus sp.			
458.		Synsphyronus magnus			
459.		Synthemistidae sp.			
460.		Tabanidae sp.			
461.		Tamopsis distinguenda			
462.		Tamopsis perthensis			
463.		Tanypodinae sp.			
464.		Tanytarsus nr K5			
465.		Tanytarsus palmatus			
466.		Tanytarsus sp.			
467.		Tasmanicosa leuckartii			
468.		Telephlebiidae sp.			
469.		Temnocephalidea sp.			
470.		Tetragnatha demissa			
471.		Tipulidae sp.			
472.		Triplectides sp. AV21 (SFM)			
473.		Trombidioidea sp.			
474.		Urodacus novaehollandiae			
475.		Uvarus pictipes			
476.		Venator immansueta			
477.	04440	Venatrix pullastra		_	
478.	34113	Westralunio carteri (Carter's Freshwater Mussel)		Т	
479.		Zachria flavicoma			
lammal					
480.	24209	Arctocephalus tropicalis (Subantarctic fur-seal)		T	
481.	24046	Balaenoptera borealis (Sei Whale)		T	
482.	24162	Bettongia penicillata subsp. ogilbyi (Woylie, Brush-tailed Bettong)		Т	
483.	24251	Bos taurus (European Cattle)	Υ		
484.	30883	Canis lupus subsp. familiaris (Dog)	Υ		
485.	24072	Caperea marginata (Pygmy Right Whale)			
486.	24086	Cercartetus concinnus (Western Pygmy-possum, Mundarda)			
487.	24186	Chalinolobus gouldii (Gould's Wattled Bat)			
488.	24092	Dasyurus geoffroii (Chuditch, Western Quoll)		Т	
489.	24052	Delphinus delphis (Common Dolphin)			
490.	24189	Falsistrellus mackenziei (Western False Pipistrelle, Western Falsistrelle)		P4	
491.	24041	Felis catus (Cat)	Υ		
492.	24055	Globicephala melas (Long-finned Pilot Whale)			
493.	24056	Grampus griseus (Risso's Dolphin)			
494.	24215	Hydromys chrysogaster (Water-rat, Rakali)		P4	
495.	25478	Isoodon obesulus (Southern Brown Bandicoot)		P4	
496.	24153	Isoodon obesulus subsp. fusciventer (Quenda, Southern Brown Bandicoot)		P4	
497.	24132	Macropus fuliginosus (Western Grey Kangaroo)			
498.		Macropus irma (Western Brush Wallaby)		P4	
499.		Macrotis lagotis (Bilby, Dalgyte)		Т	
500.		Mesoplodon bowdoini (Andrew's Beaked Whale)			
501.		Mesoplodon grayi (Gray's Beaked Whale)			
502.		Mus musculus (House Mouse)	Υ		
503.		Oryctolagus cuniculus (Rabbit)	Y		
504.		Phascogale tapoatafa (Brush-tailed Phascogale)	•		
505.		Phascogale tapoatafa subsp. wambenger (South-western Brush-tailed Phascogale,			
		Wambenger)		Т	
506.	24166	Pseudocheirus occidentalis (Western Ringtail Possum, ngwayir)		Т	
507.		Pseudomys occidentalis (Western Mouse)		P4	
508.		Pseudorca crassidens (False Killer Whale)			
509.		Rattus rattus (Black Rat)	Υ		
510.		Setonix brachyurus (Quokka)		Т	
511.		Tarsipes rostratus (Honey Possum, Noolbenger)		·	
512.		Trichosurus vulpecula (Common Brushtail Possum)			
513.		Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)			
514.		Tursiops aduncus (Indo-Pacific Bottlenose Dolphin)			
515.		Tursiops truncatus (Indu-racine Bollenose Dolphin) Tursiops truncatus (Bottlenose Dolphin)			
516.		Vespadelus regulus (Southern Forest Bat)			
517.		Vulpes vulpes (Red Fox)	Υ		
	27040	· alped · alped (red r ox)	1		
la máile					
teptile	12368	Acritoscincus trilineatus (Western Three-lined Skink)			
Reptile 518.	42300				
-	44629	Anilios australis Aprasia pulchella (Granite Worm-lizard)			





	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
521.	24991	Aprasia repens (Sand-plain Worm-lizard)			
522.	25335	Caretta caretta (Loggerhead Turtle)		Т	
523.	43380	Chelodina colliei (South-western Snake-necked Turtle)			
524.	25336	Chelonia mydas (Green Turtle)		Т	
525.	24980	Christinus marmoratus (Marbled Gecko)			
526.	30893	Cryptoblepharus buchananii			
527.	25020	Cryptoblepharus plagiocephalus			
528.	25047	Ctenotus impar			
529.	25049	Ctenotus labillardieri			
530.	25346	Dermochelys coriacea (Leatherback Turtle)		T	
531.	25251	Echiopsis curta (Bardick)			
532.	25096	Egernia kingii (King's Skink)			
533.	25100	Egernia napoleonis			
534.	25250	Elapognathus coronatus (Crowned Snake)			
535.	30919	Hemiergis gracilipes			
536.	25475	Hemiergis peronii			
537.	25117	Hemiergis peronii subsp. peronii			
538.	25118	Hemiergis peronii subsp. tridactyla			
539.	25119	Hemiergis quadrilineata			
540.	25366	Hydrophis elegans (Elegant Seasnake, Bar-bellied Seasnake)			
541.	42410	Hydrophis ornatus (Ornate Reef Seasnake, Sea Snake)			
542.	43384	Hydrophis platurus (Yellow-bellied Seasnake)			
543.	25131	Lerista distinguenda			
544.	25133	Lerista elegans			
545.	25147	Lerista lineata (Perth Slider, Lined Skink)		P3	
546.	25005	Lialis burtonis			
547.	42413	Lissolepis luctuosa (Western Swamp Skink)			
548.	25184	Menetia greyii			
549.		Morelia spilota subsp. imbricata (Carpet Python)			
550.	25191	Morethia lineoocellata			
551.	25252	Notechis scutatus (Tiger Snake)			
552.	25255	Parasuta nigriceps			
553.		Pogona minor subsp. minor (Dwarf Bearded Dragon)			
554.		Pseudonaja affinis (Dugite)			
555.		Pseudonaja affinis subsp. affinis (Dugite)			
556.		Pygopus lepidopodus (Common Scaly Foot)			
557.		Tiliqua rugosa			
558.		Tiliqua rugosa subsp. rugosa			
559.		Varanus gouldii (Bungarra or Sand Monitor)			
560.	25225	Varanus rosenbergi (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 2
 4 Priority 4
 5 Priority 5





¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholely 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 <u>Environment Assessments</u> and the EPBC Act including significance guidelines, forms and application process details.

Report created: 15/03/18 12:55:46

Summary

Details

Matters of NES
Other Matters Protected by the EPBC Act

Caveat

Acknowledgements

Extra Information



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

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 <u>Administrative Guidelines on Significance</u>.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
<u>Listed Threatened Species:</u>	25
Listed Migratory Species:	10

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	15
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	21
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Plants

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Vasse-wonnerup system	Within 10km of Ramsar

vasse-wormerup system		William Tokim of Ivalisar
Listed Threatened Ecological Communities		[Resource Information]
For threatened ecological communities where the distriplans, State vegetation maps, remote sensing imagery community distributions are less well known, existing v produce indicative distribution maps.	and other sources. Where	threatened ecological
Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain	Endangered	Community likely to occur
ecological community Clay Pans of the Swan Coastal Plain	Critically Endangered	within area Community likely to occur within area
Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
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 likely to occur within area
Calyptorhynchus banksii naso		
Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area
Calyptorhynchus baudinii		
Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Endangered	Breeding known to occur within area
Calyptorhynchus latirostris		
Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may 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, Ngoor, Ngoolangit [25911]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Plants		

Name	Status	Type of Presence
Andersonia gracilis		
Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
Banksia nivea subsp. uliginosa		
Swamp Honeypot [82766]	Endangered	Species or species habitat likely to occur within area
Banksia squarrosa subsp. argillacea		
Whicher Range Dryandra [82769]	Vulnerable	Species or species habitat may occur within area
Brachyscias verecundus		
Ironstone Brachyscias [81321]	Critically Endangered	Species or species habitat may occur within area
Caladenia busselliana		
Bussell's Spider-orchid [24369]	Endangered	Species or species habitat likely to occur within area
Caladenia huegelii		
King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat may occur within area
Chamelaucium sp. S coastal plain (R.D.Royce 4872)		
Royce's Waxflower [87814]	Vulnerable	Species or species habitat likely to occur within area
<u>Darwinia whicherensis</u>		
Abba Bell [83193]	Endangered	Species or species habitat may occur within area
<u>Diuris micrantha</u>		
Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
Drakaea elastica		
Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat known to occur within area
<u>Drakaea micrantha</u>		
Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area
Gastrolobium papilio		
Butterfly-leaved Gastrolobium [78415]	Endangered	Species or species habitat may occur within area
Lambertia echinata subsp. occidentalis		
Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat may occur within area
Petrophile latericola		
Laterite Petrophile [64532]	Endangered	Species or species habitat may occur within area
Verticordia densiflora var. pedunculata		
Long-stalked Featherflower [55689]	Endangered	Species or species habitat likely to occur within area
Verticordia plumosa var. vassensis		
Vasse Featherflower [55804]	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	
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		Openies sesential to the first
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
		, .s eccar maint aroa

Name	Threatened	Type of Presence
Migratory Terrestrial Species		31
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat likely to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat likely 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 likely to occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat likely to occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

<u> </u>		
Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on	the EPBC Act - Threatened	d Species list.
Name	Threatened	Type of Presence
Birds		* .
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat likely to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis		William Grod
Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris canutus		
Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Merops ornatus		Oni
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat likely to occur within area
Thinornis rubricollis		
Hooded Plover [59510]		Species or species habitat may occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

Invasive Species [Resource Information]

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

Name	Status	Type of Presence
Birds		
Anas platyrhynchos		
Mallard [974]		Species or species habitat likely to occur within area
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia senegalensis		
Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area

Name	Status Type of Presence
Sturnus vulgaris Common Starling [389]	Species or species habitat likely to occur within area
Mammals	
Bos taurus Domestic Cattle [16]	Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]	Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]	Species or species habitat likely to occur within area
Mus musculus House Mouse [120]	Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]	Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]	Species or species habitat likely to occur within area
Sus scrofa Pig [6]	Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]	Species or species habitat likely to occur within area
Plants	
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]	Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]	Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]	Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]	Species or species habitat may occur within area
Genista sp. X Genista monspessulana Broom [67538]	Species or species habitat may occur within area
Olea europaea Olive, Common Olive [9160]	Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]	Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]	Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x Willows except Weeping Willow, Pussy Willow and	reichardtii

Name Status Type of Presence 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

-33.57899 115.52887

Acknowledgements

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

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

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

Please feel free to provide feedback via the Contact Us page.

APPENDIX D

BLACK COCKATOO HABITAT TREE DETAILS

Habitat Trees DBH >50cm Datum - GDA94

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

Entrance Siz	ze Ran	ges - Sm	iall = >5cn	n, Medium = 5, 10cm,	Large = >1	0cm					
Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows		Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt004					0-5	1	Large	No Signs	No Signs	No	Spout - too low and shallow
wpt041			6283182		15-20	0		No Signs	No Signs	No	
wpt042	50H	363387	6283157	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt043	50H	363605	6283724	Dead Unknown	15-20	2+	Small-Medium	No Signs	No Signs	No	Depth of hollows unknown
wpt045	50H	363416	6283236	Unknown Euc	20+	0		No Signs	No Signs	No	Planted
wpt046	50H	363587	6283667	Flooded Gum	20+	0		No Signs	No Signs	No	
wpt049	50H	363745	6283697	Dead Unknown	15-20	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Depth of hollows unknown
wpt052	50H	363638	6283595	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt053	50H	363672	6283678	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt054	50H	363657	6283675	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt055	50H	363649	6283671	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt056	50H	363644	6283667	Flooded Gum	15-20	0			No Signs	No	
wpt058	50H	363651	6283607	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt059	50H	363654	6283450	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt065	50H	363518	6283616	Unknown Euc	20+	0		No Signs	No Signs	No	
wpt066	50H	363493	6283587	Marri	15-20	0		No Signs	No Signs	No	
wpt067	50H	363409	6283763	Unknown Euc	20+	0		No Signs	No Signs	No	Planted
wpt068	50H	363413	6283778	Unknown Euc	20+	0		No Signs	No Signs	No	Planted
wpt069	50H	363425	6283774	Unknown Euc	20+	0		No Signs	No Signs	No	Planted
wpt070	50H	363427	6283774	Unknown Euc	20+	0			No Signs	No	Planted
wpt078	50H	363443	6283886	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt079	50H	363526	6283911	Flooded Gum	20+	0		No Signs	No Signs	No	
wpt135	50H	363900	6284377	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt136	50H	363930	6284365	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt137	50H	364045	6284424	Dead Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt138	50H	364023	6284423	Unknown Euc	15-20	0			No Signs	No	Planted
wpt139	50H	363802	6284320	Unknown Euc	15-20	0		No Signs	No Signs	No	Planted
wpt140	50H	363820	6284292	Unknown Euc	15-20	0		No Signs	No Signs	No	Planted
wpt141	50H	363823	6284313	Unknown Euc	15-20	0		No Signs	No Signs	No	Planted
wpt142	50H	363827	6284316	Unknown Euc	15-20	0		No Signs	No Signs	No	Planted
wpt144	50H	363619	6284160	Unknown Euc	15-20	0		No Signs	No Signs	No	Planted
wpt145	50H	363604	6284152	Unknown Euc	15-20	0		No Signs	No Signs	No	Planted
wpt146	50H	363609	6284133	Unknown Euc	15-20	0		No Signs	No Signs	No	Planted
	50H	363536	6284105	Flooded Gum	20+	0			No Signs	No	
wpt148	50H	363539	6284098	Flooded Gum	20+	0		No Signs	No Signs	No	
wpt149	50H	363533	6284077	Flooded Gum	20+	0			No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Estimated Hollow Entrance Sizes	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt150	50H	363457	6284055	Flooded Gum	20+	2+	Small	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt152	50H	363236	6283953	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt153	50H	363176	6283598	Flooded Gum	20+	0		No Signs	No Signs	No	
wpt154	50H	363240	6283818	Flooded Gum	20+	0		No Signs	No Signs	No	
wpt155	50H	363233	6283829	Flooded Gum	20+	0		No Signs	No Signs	No	
wpt156	50H	363230	6283834	Flooded Gum	20+	0		No Signs	No Signs	No	
wpt157	50H	363213	6283843	Flooded Gum	20+	0		No Signs	No Signs	No	
wpt158	50H	363185	6283803	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt159	50H	363335	6283887	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt160	50H	363354	6283955	Flooded Gum	20+	0		No Signs	No Signs	No	
wpt161	50H	363354	6283904	Flooded Gum	15-20	2+	Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt163	50H	364039	6283976	Flooded Gum	15-20	0		No Signs	No Signs	No	
wpt165	50H	363778	6283511	Dead Unknown	5-10	2+	Medium-Large (cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollows unknown

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