

Fauna Assessment



Lot 101 Wallcliffe Road Prevelly

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Acronyms/Abbreviations:

ALA: Atlas of Living Australia www.ala.org.au

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

BC Act: Biodiversity Conservation Act 2016. WA Government.

°C: Degrees Celsius.

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

CAMBA: China Australia Migratory Bird Agreement 1998.

CBD: Central Business District.

DBH: Diametre at Breast Height – tree measurement.

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

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

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

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

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

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

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

DoP: Department of Planning, WA Government.

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

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

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

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

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

EPA: Environmental Protection Authority, WA Government.

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

ha: Hectare (10,000 square metres).

IBRA: Interim Biogeographic Regionalisation for Australia.

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

JAMBA: Japan Australia Migratory Bird Agreement 1981.

km: Kilometre.

m: Metre.

mm: Millimetre.

P: Priority - DPaW fauna conservation ranking.

POS: Public Open Space.

RAOU: Royal Australia Ornithologist Union.

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

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

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

SRE: Short Range Endemic.

SSC: Species Survival Commission, International.

WA: Western Australia.

WAM: Western Australian Museum, WA Government.

WAPC: Western Australian Planning Commission, WA Government.

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

WRP: Western Ringtail Possum

SUMMARY

This report details the results of a fauna assessment of Lot 101, Wallcliffe Road, Prevelly (referred to as “the site” or “Lot 101”). Lot 101 is approximately 5.31 ha in size. In order to provide contextual information for the wider area, areas in the surrounding reserves have also been included in the fauna assessment. The site and these surrounding areas are collectively referred to as the “survey area” and occupy about 11.26 ha (Figures 1 & 2).

Lot 101 is zoned ‘tourism’ under the Shires of Augusta Margaret River Local Planning Scheme (LPS) No 1 and it is understood that the landowners are proposing to redevelop the site for tourism purposes. The site contains Wallcliffe House, which was once one of the original farm and homesteads built by the Bussell family in the 1850s and contains large areas of cultivated gardens and turf. This redevelopment will require the removal/modification of some of the existing vegetation within the site, an action that has the potential to impact on current fauna habitat values.

The fauna assessment reported on here represents one of several technical reports that will be used to provide an understanding of the suite of environmental values present within the survey area which will then be used during the ongoing planning and approval process.

The scope of works was to conduct a level 1 fauna survey as defined by the EPA (EPA 2016). Because some listed threatened species (i.e. three species of black cockatoo (*Calyptorhynchus* sp.) and the western ringtail possum (WRP) (*Pseudocheirus occidentalis*)) 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. To fulfil the required scope of works the assessment has therefore included a literature review (“desktop study”) and a day and night survey carried out in April 2019.

With respect to native vertebrate fauna, 21 mammals (including nine bat species), 124 bird, 34 reptile, 10 frog and six fish species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the survey area at times. Thirteen species of introduced animals could also frequent the area.

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

Lot 101 is predominantly cleared of native vegetation with some parkland cleared native trees (mainly peppermint - *Agonis flexuosa*), managed grasses and gardens with planted non-endemic and exotic plant species remaining. Small sections of disturbed native vegetation subject to some plantings, ground disturbance and weed management occur mainly in central section of the site. The most intact vegetation is present along the west of the site adjacent to the Margaret River (a major, perennial watercourse) and to the south of the site bordering the Wallcliffe Nature Reserve. A small section of a high limestone cliff enters the site near its south west corner.

Overall the fauna habitat quality of Lot 101 can be regarded as being very low given most areas are highly degraded/modified. The fauna assemblage likely to persist in these areas is likely to be highly depauperate and would only be represented by a small subset of the predicted fauna species (Appendix B). The balance of the survey area, which generally contains larger expanses of a variety of good quality habitats can be expected to harbour a higher percentage of the predicted species. While the site itself has relatively low overall fauna habitat values it still retains some value for a range of species including some of conservation significance and this fact will need to be taken into consideration during ongoing planning and subsequent development.

The locations of various possum observations made during the day and night surveys are shown in Figure 4. Nine WRP dreys were observed during the day survey. WRP scats were also observed at three locations during the same period. Seven WRPs and five common brushtail possums were observed during the nocturnal survey. Most WRPs were seen in remnant native vegetation with one individual recorded with the grove of pine trees near the centre of Lot 101.

The results of the WRP assessment suggest that almost all the vegetation present with the survey area can be considered habitat of some type and therefore maybe used either continuously or at various times for refuge, foraging and/or dispersal.

The black cockatoo habitat assessment identified only three trees within the survey area with a DBH of ≥ 50 cm. None of the trees appeared to contain hollows of a size that would be suitable for black cockatoos to use for nesting purposes. Only one of the identified habitat trees is actually located within Lot 101.

Evidence of black cockatoos foraging was observed during the field survey in the form of chewed marri fruits and pine cones in two areas (Figure 5). This evidence was attributed to one or more of the three black cockatoo species depending on the plant species involved and the characteristics of the foraging activity (i.e. nature of remaining debris).

The overall extent of quality foraging habitat for black cockatoos within Lot 101 is very limited. Marri and red flowering gum, the most favoured native species present, are only represented by a few scattered specimens. A group of pine trees near the centre of the site appear to be a focal point of foraging activity with numerous chewed cones being observed under trees during the survey period. The total extent of quality foraging habitat within Lot 101 is difficult to estimate given that the favoured species (marri, red flowering gum and pine) are represented by only a small number of scattered trees or small groves of trees but would not amount to more than about 0.1 or 0.2 ha.

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

Besides the three black cockatoo species and the western ringtail possum, evidence of one additional fauna species of conservation significance was observed during the survey period, this being the eastern osprey (*Pandion cristatus*) (state and federally listed migratory species).

One individual of this species was observed roosting in a tree near Margaret River and on top of one of the buildings at a later time. What appears to be an osprey nest is also present in a tree near the north east boundary of Lot 101 (outside of the current development footprint).

Opportunistic fauna observations are listed in Appendix B. Including those species previously mentioned, a total of 11 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the survey area during the course of survey.

The assessment indicates that the best quality and widest range of fauna habitats within the survey area are located outside of Lot 101. As a consequence, these areas (including the reserve areas of which they form a part of) are most likely to be harbouring the greatest variety of fauna species. Any development undertaken in Lot 101 is therefore considered as unlikely to impact significantly on the current status of any fauna species presently utilising the area.

In summary five vertebrate fauna species of conservation significance were positively identified as utilising the survey area for some purpose, these being:

- Forest Red-tailed Black Cockatoo – Vulnerable;
- Baudin's Black Cockatoo – Endangered;
- Carnaby's Black Cockatoo – Endangered;
- Eastern Osprey – Migratory; and
- Western Ringtail Possum – Critically Endangered.

A number of additional vertebrate species of conservation significance may also utilise the survey area, though, as no evidence of these species' presence was identified during the field survey, the status of some in the area remains uncertain. These species are:

- Pouched Lamprey – Priority 3;
- Black Bittern – Priority 2;
- Australian Little - Priority 2;
- Masked Owl – Priority 3;
- Peregrine Falcon – Schedule 7;
- South-western Brush-tailed Phascogale - Schedule 6;
- Quenda – Priority 4;
- Western False Pipistrelle – Priority 4;
- Water Rat – Priority 4.

As indicated, most of these species would not actually utilise Lot 101 due to a lack of suitable habitats, though they may frequent nearby areas.

One invertebrate species of conservation significance has also been assessed as possibly occurring based on available information. The Cape Leeuwin freshwater snail (Vulnerable) has been collected in national park areas north and south of the survey area (DBCA 2019b) so it must be regarded as a potential species though it is considered unlikely to occur within Lot 101 itself given the disturbed nature of the site.

Overall Lot 101 has low biodiversity values and therefore impacts on fauna in general will be non-existent or negligible. Constraints on development within the subject site will largely be centred on the presence of habitat used or potentially used by threatened fauna species in particular the western ringtail possum.

The presence of this species should be taken into account during ongoing planning and subsequent development. To this end it is recommended that a fauna management plan be formulated for implementation prior to and during development. In particular the plan should define procedures for ensuring the retention and protection of existing WRP habitat wherever possible including protocols for ensuring western ringtail possums (and other fauna) are not injured or killed during site works.

It is also recommended that the tree containing the potential eastern osprey nest be specifically marked and fenced off during site works to minimise activity occurring nearby which may disturb nesting birds.

1. INTRODUCTION

This report details the results of a fauna assessment of Lot 101, Wallcliffe Road, Prevelly (referred to as “the site” or “Lot 101”). The site is located approximately 8 km south-east of Margaret River township within the Shire of Augusta-Margaret River (the Shire) (Figure 1).

Lot 101 is approximately 5.31 ha in size and is bounded by Wallcliffe Road to the east, rural residential lots to the north-east, the Margaret River to the north-west and the Wallcliffe Nature Reserve to the south (Figure 2).

In order to provide contextual information for the wider area, some areas in surrounding reserves have also been included in the fauna assessment. The site and these surrounding areas are collectively referred to as the “survey area” and occupy about 11.26 ha (Figure 2).

2. DEVELOPMENT PROPOSAL

Lot 101 is zoned ‘tourism’ under the Shires Local Planning Scheme (LPS) No 1 and it is understood that the landowners are proposing to redevelop the site for tourism purposes. The site contains Wallcliffe House, which was once one of the original farm and homesteads built by the Bussell family in the 1850s and contains large areas of cultivated gardens and turf. The redevelopment will require the removal/modification of some of the existing vegetation within the site, an action that has the potential to impact on current fauna habitat values.

The fauna assessment reported on here represents one of several technical reports that will be used to provide an understanding of the suite of environmental values present within the survey area which will then be used during the ongoing planning and approval process.

3. SCOPE OF WORKS

The scope of the fauna survey was to carry out a “desktop study” and a site reconnaissance survey consistent with a level 1 fauna survey as defined in EPA Guidance (2016), in addition to targeted surveys for western ringtail possums (WRP) and black cockatoo habitat. To fulfil this requirement the following has been undertaken:

- A literature review of ecological information pertaining to the survey area and surrounds, including database searches for conservation significant fauna species and locations.
- A ‘level 1’ (basic) fauna assessment, with additional targeted (detailed) survey for specific conservation significant fauna values, namely black cockatoos

(*Calyptorhynchus* sp.) and the western ringtail possum (*Pseudocheirus occidentalis*). As part of the survey the following sub tasks were undertaken.

- o A single day survey:
 - Opportunistically collect an inventory of fauna taxa present through visual observation and secondary evidence such as tracks, scats, skeletal remains, foraging evidence or calls if observed/heard.
 - Record the location and attributes of all potential black cockatoo habitat trees (large eucalypts with trunk diameter at breast height ≥ 50 cm, presence type and size of hollows, evidence of use, inspection to confirm use).
 - Record the location of any dreys, obvious tree hollows, scats, habitat characteristics and individual western ringtail possums. This will involve a series of close spaced traverses across vegetated sections of the survey area (concurrent with the black cockatoo habitat tree assessment).
 - Describe fauna habitat values with particular reference to black cockatoo habitat and habitat for other 'threatened' or 'priority' fauna species with potential to occur within the survey area.
- o For western ringtail possums, a single nocturnal (night) survey was undertaken in order to understand whether the possums were present within the survey area. This involved a nocturnal count to provide an estimate of the distribution and abundance of western ringtail possums.
- Documentation of fauna and fauna habitat information, field survey methods and results, into a report.

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

4. METHODS

4.1 POTENTIAL FAUNA INVENTORY - LITERATURE REVIEW

4.1.1 Database Searches

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

- DBCA's NatureMap Database Search (combined data from DBCA, ALA, WAM, BA and consultant's reports) (DBCA 2019b); and

- Protected Matters Search Tool (DotEE 2019).

It should be noted that lists produced during the abovementioned database searches contain observations/inferred distributions from a broader area than the survey area 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 survey area itself. The databases also often include or are based on very old records and in some cases certain species have become locally or regionally extinct.

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

4.1.2 Previous Fauna Surveys in the Area

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

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

- ATA Environmental (2005). Fauna Survey Riverslea Subdivision. Unpublished report for Greendene Development Corporation Ltd.
- ATA Environmental (2006). Location 413 Smiths Beach Fauna Assessment Survey. Unpublished report for Canal Rocks Properties.
- Beatty, S., Morgan, D., Jury, C. & Mitchell, J. (2006). Fish and freshwater crayfish in streams in the Cape Naturaliste region & Wilyabrup Brook. Report to the Cape to Cape Catchments Group and GeoCatch.
- Christensen, P., Annels, A., Liddelow, G. and Skinner, P. (1985). Vertebrate Fauna in The Southern Forests of Western Australia, A Survey. Forest Dept. of Western Australia, Bull. No. 94. Perth.
- Ecologia Environmental Consultants (2001). Location 413 Smiths Beach Fauna Assessment. Unpublished report for ATA Environmental.
- ENV Australia (2007). Busselton to Margaret River Transmission Line – Biological Assessment. Unpublished report for Western Power.
- GHD (2012). Flora and Fauna Assessment - Report for Margaret River Bypass. Unpublished report for MRWA.

- Green Iguana (2009). Vertebrate fauna of Lot 320 Higgins Road, Margaret River, and Shire of Augusta-Margaret River Reserves R27633 and R39081. Unpublished report for Strategen.
- Harewood (2009). Fauna Survey (Level 2). Gracetown. Unpublished report for Strategen.
- Harewood, G. (2012a). Western Ringtail Possum & Black Cockatoo Survey of Trinder Drive Precinct Margaret River. Unpublished report for Trinder Drive Landowners Group.
- Harewood, G. (2012b). Fauna Assessment - Bussell Highway Bramley Forest Section (90.62 – 93.77 SLK), Margaret River. Unpublished report for GHD/MRWA.
- Harewood, G. (2013). Western Ringtail Possum Survey of Lots 72 and 73 Kevill Road, Margaret River. Unpublished report for TME Town Planning Management Engineering Pty Ltd.
- Harewood, G. (2017). Fauna Assessment Lots 4, 5, 7, 8, 9, 10 & 11 Doyle Place Margaret River. Unpublished report for Halsall and Associates.
- Harewood, G. (2018). Fauna Assessment Lots 3, 4, 111 and 113 Brumby Place; Lots 101 and 102 Exmoor Drive; and Lots 103, 104, 107 and 108 Boodjidup Road, Margaret River. Unpublished report for Halsall and Associates.
- How, R.A., Dell, J., and Humphreys, W. F. (1987). The ground vertebrate fauna of coastal areas between Busselton and Albany, Western Australia. Records of the Western Australian Museum 13(4):553-574.
- Morgan, D. and Beatty, S. (2003). Fish fauna of Margaret River Western Australia. Report to the Margaret River Regional Environment Centre.
- Western Wildlife (2007). Gracetown Development - A Fauna Assessment. Unpublished report for Strategen.

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

4.1.3 Existing Publications

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

- Anstis, M. (2013). Tadpoles and Frogs of Australia. New Holland Publishers, Sydney.

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

- Wilson, S. and Swan, G. (2017). A Complete Guide to Reptiles of Australia. Reed, New Holland, Sydney.
- Woinarski, J., Burbidge, A. & Harrison, P. (2014). The Action Plan for Australian Mammals 2012. CSIRO Publishing.

4.1.4 Fauna of Conservation Significance

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

- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. Administered by the Australian Government DoEE;
- *Wildlife Conservation Act 1950 (WC Act)*. Administered by the Western Australian DBCA (Govt. of WA 2018). Note: The Wildlife Conservation (Specially Protected Fauna) Notice 2018 has been transitioned under regulations 170, 171 and 172 of the Biodiversity Conservation Regulations 2018 to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the *Biodiversity Conservation Act 2016 (BC Act)*;
- Red List produced by the Species Survival Commission (SSC) of the World Conservation Union (also known as the IUCN Red List - the acronym derived from its former name of the International Union for Conservation of Nature and Natural Resources). The Red List has no legislative power in Australia but is used as a framework for State and Commonwealth categories and criteria; and the
- DBCA Priority Fauna list. A non-statutory list maintained by the DBCA for management purposes (DBCA 2019a).

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

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

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

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

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

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

4.1.5 Invertebrate Fauna of Conservation Significance

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

No assessment of the potential for short range endemic species (SREs) to be present has been made at this stage as it can be difficult to identify significant invertebrate species due to uncertainties in determining the range-restrictions of many species due to lack of surveys, lack of taxonomic resolutions within target taxa and problems in identifying certain life stages. Where invertebrates are collected during surveys, a high percentage are likely to be unknown, or for known species there can be limited knowledge or information on their distribution (Harvey 2002).

4.1.6 Likelihood of Occurrence – Fauna of Conservation Significance

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

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

- **Unlikely to Occur:** The survey area 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 survey area itself would not support a population or part population of the species.
- **Possibly Occurs:** The survey area 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 survey area. In some cases, while a species may be classified as possibly being present at times, habitat may be marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.
- **Known to Occur:** The species in question was positively identified as being present (for sedentary species) or as using the survey area as habitat for some other purpose (for non-sedentary/mobile species) during the field survey. This information may have been obtained by direct observation of individuals or by way of secondary evidence (e.g. foraging debris, tracks and scats). In some cases, while a species may be classified as known to occur, habitat may be marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.

4.1.7 Taxonomy and Nomenclature

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

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

4.2 SITE SURVEYS

Day and night field work within the survey area was carried out on the 1 April 2019. Survey work was done by Greg Harewood (consultant Zoologist), Kirsten Knox (Environmental Scientist – Emerge Associates) and Heidi Becker (Environmental Scientist – Emerge Associates).

4.2.1 Fauna Habitat Assessment

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

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

4.2.2 Western Ringtail Possum Assessment

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

- One daytime survey of the survey area which involved searching for dreys, obvious tree hollows (and other potential daytime refuge habitat), scats and individual WRPs. The day time survey was carried out using a GPS equipped PDA for guidance and as a data recorder;
- One night time survey to locate and record the distribution and abundance of WRPs. The nocturnal count involved the systematic searching of potential WRP habitats within the survey area on foot using a head torch. The nocturnal count was carried out using a GPS equipped PDA for guidance and as a data recorder.

It should be noted that vegetation with the Wallcliffe Nature Reserve (located south of the site), which forms part of the survey area, is extremely dense and it was not possible to survey this area for WRPs to the same degree as other sections of the survey area.

4.2.3 Black Cockatoo Habitat Assessment

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

- be done by a suitably qualified person with experience in vegetation or cockatoo surveys, depending on the type of survey being undertaken;
- maximise the chance of detecting the species' habitat and/or signs of use;
- determine the context of the site within the broader landscape—for example, the amount and quality of habitat nearby and in the local region (for example, within 12 km);

- account for uncertainty and error (false presence and absences); and
- include collation of existing data on known locations of breeding and feeding birds and night roost locations.

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

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

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

4.2.3.1 Black Cockatoo Breeding Habitat

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

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

The location of each tree identified as being over the threshold DBH was recorded with a GPS and details on tree species, number and size of hollows (if any) noted.

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

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

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

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

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

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

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

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

4.2.3.2 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.

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

4.2.3.3 Black Cockatoo Roosting Habitat

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

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

4.2.4 Other Species of Conservation Significance

Evidence of the presence or likely presence of other species of conservation significance (including suitable habitat) was searched for and recorded concurrent with other field work. The aim was to obtain sufficient information to make a definitive comment on the likely significance of the survey area to other species of conservation significance which may be present.

4.2.5 Opportunistic Fauna Observations

Opportunistic observations of all fauna species were made during the field survey. Secondary evidence of a species presence such as tracks, scats, skeletal remains, foraging evidence or calls were also noted if observed/heard.

5. SURVEY CONSTRAINTS

No seasonal sampling has been carried out as part of this fauna assessment. The conclusions presented are based upon field data and the environmental monitoring and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the survey area 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 survey area based on there being suitable habitat (quality and extent) within the survey area 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 survey area.

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 survey area. As a consequence of this limitation the potential fauna list produced is most likely an overestimation of those species that actually utilise the survey area for some purpose. Some

species may be present in the general area but may only use the survey area 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 survey area (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 survey area.

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

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

6. RESULTS

6.1 POTENTIAL FAUNA INVENTORY – LITERATURE REVIEW

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

The results of some previous fauna surveys carried out in the general area are summarised in this species listing as are the DBCA NatureMap database search results. Species considered unlikely to occur with the survey area but previously recorded in other surveys and/or which appear in the DBCA database search are not listed. The raw database search results from NatureMap (DBCA 2019b) and the Protected Matters Search Tool (DotEE 2019) are contained within Appendix C.

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

With respect to native vertebrate fauna, 21 mammals (includes nine bat species), 124 bird, 34 reptile, 10 frog and six fish species have previously been recorded in the general area, some

of which have the potential to occur in or utilise sections of the survey area at times. Thirteen species of introduced animals could also frequent the area.

Of the 196 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. In addition, one migratory and seven DBCA priority species have also been listed as potentially present. One invertebrate species of conservation significance also has the potential to be present in the survey area.

These species are discussed in further detail in the following sections.

6.2 SITE SURVEYS

6.2.1 Fauna Habitat Assessment

Descriptions and example images of the main fauna habitats/dominant vegetation present within the survey area are provided in Table 1. The location and extent of each of the identified habitat/vegetation units is shown in Figure 3 (data courtesy Emerge Associates 2019).

A review of publicly available historical images from 2004 onwards shows that the majority of the site was cleared of native vegetation prior to 2004 while in use for residential purposes (WALIA 2018). Currently Lot 101 remains predominantly cleared of native vegetation with some parkland cleared native trees (mainly peppermint - *Agonis flexuosa*), managed grasses and gardens with planted non-endemic and exotic plant species remaining. Small sections of disturbed native vegetation subject to some plantings, ground disturbance and weed management occur mainly in central section of the site. The most intact vegetation is present along the west of the site adjacent to the Margaret River (a major, perennial watercourse) and to the south of the site bordering the Wallcliffe Nature Reserve. A small section of a high limestone cliff enters the site near its south west corner.

Table 1: Main Fauna Habitats within the Survey area

Unit Code (see Figure 3)	Fauna Habitat Description	Example Image
AfW	Woodland of Peppermint over open shrubland over open mixed forbland and open to closed grassland of weeds. Lot 101 = ~0.63 ha Balance of Survey Area = ~0.21 ha	

Unit Code (see Figure 3)	Fauna Habitat Description	Example Image
AfSgHcW	Woodland of Peppermint over shrubland with vineland over low shrubland of over forbland. Lot 101 = ~0.33 ha Balance of Survey Area = ~2.45 ha	
CcAfW	Woodland of Marri and Peppermint over shrubland with vineland over weeds. Lot 101 = ~0.05 ha Balance of Survey Area = ~0.42 ha	
MhBvTrCS	Low open woodland of Peppermint with closed shrubland with vineland over open forbland and sparse sedgeland or grassland. Lot 101 = ~0.16 ha Balance of Survey Area = ~1.96 ha	

Unit Code (see Figure 3)	Fauna Habitat Description	Example Image
MrLOF	Low open forest of Paperbark over open to closed rush/sedgeland over sparse forbland bordering Margaret River. Lot 101 = ~0.13 ha Balance of Survey Area = ~0.79 ha	
Cleared/ Planted	Modified vegetation comprising grassland, weeds with occasional native trees and planted vegetation. Lot 101 = ~3.98 ha Balance of Survey Area = ~0.08 ha	

As indicated in Table 1 the majority of the site (3.98 ha ~75% of total area) contains modified vegetation with bare soil, scattered native trees over pasture grasses or planted vegetation (including buildings and roads). A sparse, generally degraded peppermint woodland makes up about 12% (0.63ha) of the site. The balance of Lot 101 contains small sections of remnant native vegetation that extends into the surrounding survey area and reserves (Figure 3).

Overall the fauna habitat quality of Lot 101 can be regarded as being very low given most areas are highly degraded/modified. The fauna assemblage likely to persist in these areas is likely to be highly depauperate and would only be represented by a small subset of the predicted fauna species (Appendix B). The balance of the survey area, which generally contains larger expanses of a variety of good quality habitats can be expected to harbour a higher percentage of the predicted species. While the site itself has relatively low overall fauna habitat values it still retains some value for a range of species including some of conservation significance and this fact will need to be taken into consideration during ongoing planning and subsequent development of the site.

Based on available vegetation mapping it is estimated that there is approximately 14,200 ha of native vegetation within 12 km the survey area (with large proportions of this protected in

national park or nature reserves). Remnant native vegetation (excluding scattered trees) present within Lot 101 (total ~1.33 ha) makes up ~0.009% of this total.

6.2.2 Western Ringtail Possum Assessment

The locations of various possum observations made during the day and night surveys are shown in Figure 4.

Nine WRP dreys were observed during the day survey. WRP scats were also observed at three locations during the same period.

The majority of dreys were found in dense vegetation bordering Margaret River. It should be noted that human structures (e.g. houses/sheds), forks in trees, subtle cavities in tree trunks, fallen hollow logs, rabbit burrows and dense ground cover are also used by WRPs for daytime refuge (to varying degrees) and therefore observations of dreys only provide a guide to WRP habitat use/quality as other opportunities for daytime refuge may exist.

Seven WRPs and five common brushtail possums were observed during the nocturnal survey. It should be noted that these observations represent the minimum number of WRPs present, as it is unlikely that all individuals were observed during the single nocturnal survey. Most WRPs were seen in remnant native vegetation with one individual recorded with the grove of pine trees near the centre of Lot 101.

The results of the WRP assessment suggest that almost all the vegetation present within the survey area can be considered habitat of some type and therefore may be used either continuously or at various times for refuge, foraging and/or dispersal. The quality is however highly variable depending on factors such as plant species, structure (e.g. midstorey component) and canopy connectivity. Much of the native vegetation within Lot 101 itself has been removed, with areas remaining being generally fragmented and with limited intact midstorey. Other areas have been planted as gardens with non-endemic and exotic species dominating.

6.2.3 Black Cockatoo Habitat Assessment

6.2.3.1 Black Cockatoo Breeding Habitat

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

- Marri – *Corymbia calophylla*.

A summary of the potential black cockatoo habitat trees observed within the survey area is provided in Table 2 below and their location shown in Figure 5.

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

Total Number of Habitat Trees Recorded	Number of Trees with <u>No Hollows</u> Observed	Number of Trees with Hollows Considered <u>Unsuitable</u> for Nesting Black Cockatoos	Number of Trees with Hollows Considered <u>Possibly</u> Suitable for Nesting Black Cockatoos
3	2	1	0

The assessment identified only three trees within the survey area with a DBH of $\geq$ 50cm. None of the trees appeared to contain hollows of a size that would be suitable for black cockatoos to use for nesting purposes. Only one of the identified habitat trees is actually located within Lot 101 (Figure 5).

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

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 14,200 ha of native vegetation within 12 km the subject site. A significant portion of this vegetation is located within the Leeuwin-Naturaliste and Bramley National Parks. These areas (in addition to areas of private and crown land) and in particular that further inland, are likely to contain “potential” breeding habitat (i.e. suitable tree species with a DBH $\geq$ 50cm).

6.2.3.2 Black Cockatoo Foraging Habitat

The following represents a list of native (including non-endemics) plant species recorded within the survey area by Emerge Associates (2019) which are known (or highly likely) to be used by one or more of the black cockatoo species as a food source (i.e. foraging habitat).

- Marri – *Corymbia calophylla* - flowers, seeds, nectar.
- Red Flowering Gum - *Corymbia ficifolia* - flowers, seeds, nectar.
- Parrot Bush - *Banksia sessilis* - flowers, seeds.
- Olive-leaved Hakea - *Hakea oleifolia* – seeds.
- Peppermint - *Agonis flexuosa* – bark, grubs/invertebrates.
- Orange Wattle - *Acacia saligna* – fresh bark/grubs/invertebrates.
- Sheoak – *Allocasuarina* spp. – seeds.

It should be noted that the degree to which the various plant species are utilised varies considerably. For example, marri is documented as being the primary food source for all three species, though jarrah and *banksia* make up a high proportion of some black cockatoo species in other areas where they proliferate. Jarrah is absent from the survey area and *banksia* was only represented by one single parrot bush specimen. Other more common plants such as orange wattle and peppermint (for example) are only foraged upon rarely.

Evidence of black cockatoos foraging was observed during the field survey in the form of chewed marri fruits and pine cones in two areas (Figure 5). This evidence was attributed to one or more of the three black cockatoo species depending on the plant species involved and the characteristics of the foraging activity (i.e. nature of remaining debris). Representative examples of the foraging activity observed are shown in Table 3.

The overall extent of quality foraging habitat within Lot 101 is very limited. Marri and red flowering gum, the most favoured native species present, are only represented by a few scattered specimens. A group of pine trees near the centre of the site appear to be a focal point of foraging activity with numerous chewed cones being observed under trees during the survey period. However, the total extent of this resource is also quite small.

The total extent of quality foraging habitat within Lot 101 is difficult to estimate given that the favoured species (marri, red flowering gum and pine) are represented by only a small number of scattered trees or small groves of trees but would not amount to more than about 0.1 or 0.2 ha.

Table 3: Foraging Evidence Examples

Foraging Evidence Description	Example Image
Marri Fruits – foraging activity attributed to the forest red-tailed black-cockatoo.	

Foraging Evidence Description	Example Image
Marri Fruits – foraging activity attributed to the Baudin's black cockatoo.	
Marri Fruits – foraging activity attributed to Carnaby's black cockatoo.	
Pine Cones – foraging activity attributed to Carnaby's black-cockatoo or Baudin's black cockatoo.	

Based on available vegetation mapping it is estimated that there is approximately 14,200 ha of native vegetation within 12 km the subject site (~30% of the total area, though it should be noted that a high proportion of the 12 km buffer is ocean), much of which is very likely to represent potential black cockatoo foraging habitat of some type. There is also up to 480 ha of pine plantations within 12 km of the subject site, and these areas are likely to represent a significant foraging resource for Carnaby's and Baudin's black cockatoos in this area.

6.2.3.3 Black Cockatoo Roosting Habitat

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

A review of the 2018 Great Cocky Count database shows no documented roost sites within the survey area. There are 14 documented roost sites with 12 km of the survey area. Seven of these roost sites were monitored during the 2018 Great Cocky Count (April 2018) but none were found to be in use at the time (Peck *et al.* 2018). The results of the 2019 survey are pending.

6.2.4 Other Species of Conservation Significance

Besides the three black cockatoo species and the western ringtail possum, evidence of one additional fauna species of conservation significance was observed during the survey period, this being the eastern osprey (*Pandion cristatus*) (state and federally listed migratory species).

One individual of this species was observed roosting in a tree near Margaret River and on top of one of the buildings at a later time. What appears to be an osprey nest is also present in a tree near the north east boundary of Lot 101 (outside of the current development footprint). While listed under state and federal legislation as migratory the eastern osprey is not a threatened species, however the fact that it may breed in close proximity to the proposed development will need to be taken into consideration.

6.2.5 Opportunistic Fauna Observations

Opportunistic fauna observations are listed in Appendix B. Including those species previously mentioned, a total of 11 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the survey area during the course of survey. The low number of observations can be attributed to the small size of the survey area, its largely degraded state and the limited time (~ five hours over one day/night) spent on site.

6.3 FAUNA INVENTORY – SUMMARY

6.3.1 Vertebrate Fauna

Table 3 summarises the number of vertebrate fauna species potentially occurring within or utilising at times the survey area, 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 survey area is located in Appendix B.

As previously discussed, despite the omission of some species it should be noted that the list provided is still very likely an over estimation of the fauna species utilising the survey area (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 survey area.

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

Group	Total number of <u>Potential</u> species	Potential number of <u>Specially Protected</u> species	Potential number of <u>Migratory</u> species	Potential number of <u>Priority</u> species	Number of species <u>recorded</u> during field survey
Fish	7 ¹	0	0	1	0
Amphibians	10	0	0	0	0
Reptiles	34	0	0	0	0
Birds	130 ⁶	4	1	3	8
Non-Volant Mammals	18 ⁶	2	0	2	3
Volant Mammals (Bats)	9	0	0	1	0
Total	208¹³	6	1	7	11

Superscript = number of introduced species included in total.

6.3.2 Vertebrate Fauna of Conservation Significance

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

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

- Baudin's Black-Cockatoo *Calyptorhynchus baudinii* – S3 (*BC Act*), Endangered (*EPBC Act*)
Known to occur. Not seen during the survey period but some foraging evidence attributed to this species found within the survey area (chewed marri fruits and pine cones). Lot 101 contains a single potential breeding habitat tree (DBH ≥ 50 cm) but no suitable hollows are present. Extent of quality foraging habitat with Lot 101 is very limited and no evidence of roosting observed.

- Carnaby's Black-Cockatoo *Calyptorhynchus latirostris* – S2 (BC Act), Endangered (EPBC Act)
Known to occur. Not seen during the survey period but some foraging evidence attributed to this species found within the survey area (chewed marri fruits and pine cones). Lot 101 contains a single potential breeding habitat tree (DBH >50cm) but no suitable hollows are present. Extent of quality foraging habitat with Lot 101 is very limited and no evidence of roosting observed.
- Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* – S3 (BC Act), Vulnerable (EPBC Act)
Known to occur. Not seen during the survey period but some foraging evidence attributed to this species found within the survey area (chewed marri fruits and pine cones). Lot 101 contains a single potential breeding habitat tree (DBH >50cm) but no suitable hollows are present. Extent of quality foraging habitat with Lot 101 is very limited and no evidence of roosting observed.
- Eastern Osprey *Pandion haliaetus* – S5 (BC Act), Migratory (EPBC Act)
Recorded during survey period and a potential nest site is located near the northern most boundary of Lot 101.
- Western Ringtail Possum *Pseudocheirus occidentalis* – S1 (BC Act), Critically Endangered (EPBC Act)
Recorded during the survey period and potentially uses most vegetation in the survey area for some purpose at times.

Based on the habitats present and current documented distributions it is considered possible that several additional species may use the survey area for some purpose at times (but necessarily Lot 101). As no evidence of any was found their status within the survey area remains uncertain.

These species are:

- Pouched Lamprey *Geotria australis* – P3 (DBCA Priority Species)
Known to migrate up Margaret River where it breeds but Lot 101 itself does not contain any habitat that this species would utilise.
- Peregrine Falcon *Falco peregrinus* – S7 (BC Act)
Uncommon but this species potentially utilises the survey area as part of a much larger home range. Would not nest within Lot 101 and only likely to forage within this area very occasionally.
- Masked Owl (SW population) - *Tyto n. novaehollandiae* – P3 (DBCA Priority Species)
Relatively uncommon but may occur, if only occasionally. Would not nest within Lot 101 and only likely to forage within this area very occasionally.
-

- Black Bittern *Ixobrychus flavicollis* – P2 (DBCA Priority Species)
Riverside vegetation (mostly outside of Lot 101) appears suitable for this species. Not often recorded but must be considered a potential species.
- Australian Little Bittern *Ixobrychus dubius* – P4 (DBCA Priority Species)
Riverside vegetation (mostly outside of Lot 101) appears suitable for this species. Not often recorded but must be considered a potential species.
- South-western Brush-tailed Phascogale *Phascogale tapoatafa wambenger* – S6 (BC Act)
Possibly occurs though the majority of the habitats present appear marginal due to a lack of hollow bearing trees, especially within Lot 101 itself where it is least likely to occur.
- Quenda *Isoodon fusciventer* – P4 (DBCA Priority Species)
Required dense groundcover to persist so most of the survey area (and almost all of Lot 101) is unsuitable. May be present in riparian vegetation along Margaret River.
- Western False Pipistrelle *Falsistrellus mackenziei* – P4 (DBCA Priority Species)
Uncommon species but possibly forages along the Margaret River and in open areas on land. Unlikely to roost in the survey area due to a lack of suitable hollows especially within Lot 101 itself.
- Water Rat *Hydromys chrysogaster* – P4 (DBCA Priority Species)
Likely to forage within Margaret River and riverside vegetation (mostly outside of Lot 101) appears suitable for this species.

Note: Habitat for some of these species within the survey area, while considered possibly suitable, may be marginal in extent/quality and the species listed may only visit the area for short periods, or as rare/uncommon vagrants/transients.

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

6.3.3 Invertebrate Fauna of Conservation Significance

Several invertebrate species of conservation significance appeared in the DBCA database search (DBCA 2019b) however most have been assessed as being unlikely to be present especially within Lot 101 itself due to a lack of suitable habitat and/or likely local extinction.

The single species which may occur at least in the wider area is:

- Cape Leeuwin Freshwater Snail - *Austroassiminea letha*- S3 (BC Act)
There are no records of this species from along the Margaret River but it has been recorded north and south of Prevelly in the recent past (DBCA 2019b). Considered

unlikely to occur within Lot 101 as possible habitat (base of limestone cliff) limited in extent and no seepages noted – more likely to occur in the Wallcliffe Nature Reserve though actual status is unknown.

7. POTENTIAL IMPACTS

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

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

Based on the likely scale of habitat loss which the proposed development may result in (which is likely to be minimal based on the proposed retention of the majority of existing vegetation) and other factors such as the extent of similar vegetation in surrounding areas, its quality and degree of fragmentation, the possible impacts on species of conservation significance previously recorded in the general area has been assessed, a summary of which is provided in Table 4 below.

It should be noted that the best quality and widest range of fauna habitats within the survey area are located outside of Lot 101. As a consequence, these areas (including the reserve areas of which they form a part of) are most likely to harbour the greatest variety of fauna species. Any development undertaken in Lot 101 is therefore considered as unlikely to impact significantly on the current status of any fauna species presently utilising the area.

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

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments/Possible Impacts
	BC Act/ DBCA Priority	EPBC Act				
Western Pygmy Trapdoor Spider <i>Bertmainius opimus</i>	P3	-	Poorly documented - Lives in shallow burrows on eucalyptus bark or in topsoil.	?	Unlikely to Occur	Previously recorded in nearby Karri forest (DBCA 2019b). Considered unlikely to occur as habitat unlikely to be suitable. No impact on this species anticipated.
Cape Leeuwin Freshwater Snail <i>Austroassiminea lethra</i>	S3	-	Natural seepages from limestone or lime sands	Yes?	Possibly occurs? Wallcliffe Nature Reserve only.	No records from along the Margaret River (DBCA 2019b). Considered unlikely to occur within Lot 101 as possible habitat (base of limestone cliff) limited in extent and no seepages noted – more likely in Wallcliffe Nature Reserve though actual status unknown. No impact on this species anticipated.
Margaret River Hairy Marron <i>Cherax tenuimanus</i>	S1	CR	Upper reaches of Margaret River.	No	Would Not Occur.	Would not occur in lower reaches of Margaret River. No impact on this species will occur.
Margaret River Burrowing Crayfish <i>Engaewa pseudoreducta</i>	S1	CR	Narrow creek tributaries of the Margaret River which are densely vegetated on heavy grey/yellow clay soils.	No	Would Not Occur.	Would not occur in lower reaches of Margaret River. No impact on this species will occur.
Grey Vernal Katydid <i>Kawaniphila pachomai</i>	P1	-	Not documented.	?	Would Not Occur.	Given the lack of published records and apparent knowledge on this species, its status within the survey area is difficult to determine, however the probability of it being present can be regarded as being extremely low. No impact on this species will occur.
a ground beetle <i>Trichosternus relictus</i>	P3	-	Not documented.	?	Would Not Occur.	The only records of this species in NatureMap (5) are from 1959 and 1931 (DBCA 2109b). Considered very unlikely to occur. No impact on this species will occur.
Carter's Freshwater Mussel <i>Westralunio carteri</i>	S3	VU	Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots.	No	Would Not Occur.	Would not occur in lower reaches of Margaret River. No impact on this species will occur.
Pouched Lamprey <i>Geotria australis</i>	P3	-	This species lives in mud burrows in the upper reaches of coastal streams for the first 4 years of life until migrating to the sea. Adults migrate up to 60km upstream during spawning.	Yes	Possibly Occurs (Margaret River only).	Known to migrate up Margaret River. No impact on this species anticipated.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments/Possible Impacts
	BC Act/ DBCA Priority	EPBC Act				
Mud Minnow <i>Galaxiella munda</i>	S3	-	Typically found in small flowing streams near submerged vegetation, occasionally in still water of ponds, swamps and roadside drains. Water is usually darkly tannin stained and acidic (pH 3.0 – 6.0).	No	Would Not Occur.	Would not occur in lower reaches of Margaret River. No impact on this species will occur.
Balston's Pygmy Perch) <i>Nannatherina balstoni</i>	S3	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.	Would not occur in lower reaches of Margaret River. No impact on this species will occur.
White-bellied Frog <i>Geocrinia alba</i>	S1	EN	Occurs only in the Karradale-Witchcliffe area where it persists along creeklines within agricultural landscapes, provided suitable riparian habitat remains intact.	No	Would Not Occur.	This species does not occur along Margaret River. With all records being in the Karradale-Witchcliffe area (DBCA 2019b). No impact on this species will occur.
Malleefowl <i>Leipoa ocellata</i>	S3	VU	Mainly scrubs and thickets of mallee Eucalyptus spp., boree Melaleuca lanceolata and bowgada Acacia linophylla, also dense litter forming shrublands.	No	Would Not Occur.	This species is regionally extinct. No impact on this species will occur.
Migratory Shorebirds/Wetland Species/Marine Species (various reptiles, birds and mammals)	S5, Various	Ma, Mig, Various	Varies between species but includes open ocean, beaches and permanent/temporary wetlands varying from billabongs, swamps, lakes, floodplains, sewerage farms, saltwork ponds, estuaries, lagoons, mudflats sandbars, pastures, airfields, sports fields and lawns.	No	Would Not Occur.	There is no suitable habitat for any of these species within the survey area. No impact on any of these species will occur.
Hooded Plover <i>Thinornis rubricollis</i>	P4	-	Broad sandy ocean beaches and bays, coastal and inland salt lakes.	No	Would Not Occur.	There is no suitable habitat for this species in the survey area. No impact on any of these species will occur.
Eastern Osprey <i>Pandion haliaetus</i>	S5	Ma, Mig	Coasts, estuaries, bays, inlets, islands, and surrounding waters, coral atolls, reefs, lagoons, rock cliffs and stacks. Ascends larger rivers.	Yes	Known to Occur	Recorded during survey period and a potential nest site is located near the northern most boundary of Lot 101. This area is not subject to any current development plans and therefore no impact on this species is anticipated.
Peregrine Falcon <i>Falco peregrinus</i>	S7	-	Diverse from rainforest to arid shrublands, from coastal heath to alpine Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes.	Yes	Possibly Occurs.	Uncommon but the survey area may represent part of a larger home range used by individuals of this species. Would not breed within Lot 101. No impact on this species anticipated.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments/Possible Impacts
	BC Act/ DBCA Priority	EPBC Act				
Masked Owl (SW population) <i>Tyto n. novaehollandiae</i>	P3	-	Roosts and nests in heavy forest, hunts over open woodlands and farmlands.	Yes	Possibly Occurs.	Relatively uncommon but may occur, if only occasionally. Any proposed development is however unlikely to impact on this species.
Barking Owl (SW population) <i>Ninox connivens connivens</i>	P3	-	Dense vegetation, especially forest and thickets of waterside vegetation such as <i>melaleucas</i> . Roosts in tree hollows.	Yes	Unlikely to Occur	No suitable habitat within Lot 101 itself and only rarely recorded in the south west. Considered unlikely to occur. No impact on this species anticipated.
Australasian Bittern <i>Botaurus poiciloptilus</i>	S2	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.	Riverside vegetation (mostly outside of Lot 101) appears marginal for this species and therefore it is considered unlikely to occur. No impact on this species will occur.
Black Bittern <i>Ixobrychus flavicollis</i>	P2	-	Freshwater pools, swamps and lagoons well screened with trees. Shelters in dense waterside vegetation.	Yes	Possibly Occurs	Riverside vegetation (mostly outside of Lot 101) appears suitable for this species. Not often recorded but must be considered a potential species. Areas of preferred habitat are however not subject to any current development plans and therefore no impact on this species is anticipated.
Australian Little Bittern <i>Ixobrychus dubius</i>	P4	-	Dense vegetation surrounding/within freshwater pools, swamps and lagoons, well screened with trees. Shelters in dense beds of <i>Typha</i> , <i>Baumea</i> and tall rushes in freshwater swamps around lakes and along rivers.	Yes	Possibly Occurs	Riverside vegetation (mostly outside of Lot 101) appears suitable for this species. Not often recorded but must be considered a potential species. Areas of preferred habitat are however not subject to any current development plans and therefore no impact on this species is anticipated.
Noisy Scrub-bird <i>Atrichornis clamosus</i>	S2	EN	Areas of dense understorey or lower stratum of sedges and shrubs, a dense accumulation of leaf litter and an abundant population of litter-dwelling invertebrates.	No	Would Not Occur.	This species is regionally extinct. No impact on this species will occur.
Western Whipbird <i>Psophodes nigrogularis</i>	S2	EN	Dense shrubland with an open overstorey.	No	Would Not Occur.	This species is regionally extinct. No impact on this species will occur.
Carnaby's Black Cockatoo <i>Calyptorhynchus latirostris</i>	S2	EN	Forests, woodlands, heathlands, farms; feeds on <i>Banksia</i> , <i>Hakea</i> and Marri.	Yes	Known to Occur	The survey area contains a small amount of foraging habitat, but no actual breeding hollows and no evidence of roosting found. The proposed small-scale development will not significantly impact on this species.
Baudin's Black Cockatoo <i>Calyptorhynchus baudinii</i>	S2	EN	Mainly eucalypt forests where it feeds primarily on the marri seeds.	Yes	Known to Occur	The survey area contains a small amount of foraging habitat, but no actual breeding hollows and no evidence of roosting found. The proposed small-scale development will not significantly impact on this species.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments/Possible Impacts
	BC Act/ DBCA Priority	EPBC Act				
Forest Red-tailed Black Cockatoo <i>Calyptorhynchus 29enicil naso</i>	S3	VU	Eucalypt forests, feeds on marri, jarrah, blackbutt, karri, sheoak and snottygobble.	Yes	Known to Occur	The survey area contains a small amount of foraging habitat, but no actual breeding hollows and no evidence of roosting found. The proposed small-scale development will not significantly impact on this species.
Fork-tailed Swift <i>Apus pacificus</i>	S5	Ma, Mig	Low to very high airspace over varied habitat from rainforest to semi desert.	Yes	Unlikely to Occur, Flyover only on very rare occasions.	May occur very occasionally for brief periods. Entirely aerial. No impact on this species will occur.
Chuditch <i>Dasyurus geoffroii</i>	S3	VU	Forest, mallee shrublands, woodland and desert. The densest populations have been found in riparian jarrah forest.	Yes	Unlikely to Occur	Not recorded in recent times in the general area (DBCA 2019b) so considered as unlikely to occur. No impact on this species is anticipated.
South-western Brush-tailed Phascogale <i>Phascogale tapoatafa wambenger</i>	S6	-	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover.	Yes/Marginal	Possibly Occurs.	Possibly occurs though the majority of the habitats present appear marginal due to a lack of hollow bearing trees, especially within Lot 101 itself. The proposed small-scale development will not significantly impact on this species.
Numbat <i>Myrmecobius fasciatus</i>	S2	EN	Open Woodlands generally dominated by eucalypts that provide hollow logs and branches for shelter and termites for food.	No	Would Not Occur.	This species is regionally extinct. No impact on this species will occur.
Quenda <i>Isodon fusciventer</i>	P4	-	Dense scrubby, often swampy, vegetation with dense cover.	Yes	Possibly Occurs.	Requires dense groundcover to persist so most of the survey area (and almost all of Lot 101) is unsuitable. May be present in riparian vegetation along Margaret River. This area is not subject to any current development plans and therefore no impact on this species is anticipated.
Bilby <i>Macrotis lagotis</i>	S3	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.	This species is regionally extinct. No impact on this species will occur.
Western Ringtail Possum <i>Pseudocheirus occidentalis</i>	S1	CR	Coastal peppermint, coastal peppermint-tuart, jarrah-marri associations, sheoak woodland, and eucalypt woodland and mallee.	Yes	Known to Occur.	Recorded during the survey period and potentially uses most vegetation in the survey area for some purpose at times. The proposed small-scale development is considered as unlikely to significantly impact on the extent suitable habitat currently present. However, the potential for individuals to be injured or killed during any clearing operations will need to be managed.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments/Possible Impacts
	BC Act/ DBCA Priority	EPBC Act				
Quokka <i>Setonix brachyurus</i>	S3	VU	Currently restricted to densely vegetated coastal heaths, swamps, riverine habitats including tea-tree thickets on sandy soils along creek systems.	No	Would Not Occur.	This species appears to be locally extinct. No impact on this species will occur.
Woylie <i>Bettongia penicillate ogilbyi</i>	S1	EN	Open forest and woodland with a low, dense, understorey of tussock grasses or woody scrub. Formerly occurred in a wider range of habitats including spinifex hummock grasslands.	No	Would Not Occur.	This species is locally extinct. No impact on this species will occur.
Western Brush Wallaby <i>Notamacropus irma</i>	P4	-	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets.	Yes	Unlikely to Occur	Possibly occurs in larger remnants in nearby national park areas but not likely to frequent the survey area. No impact on this species will occur.
Tammar Wallaby <i>Notamacropus derbianus</i>	P4	-	Coastal scrub, heath, dry sclerophyll forest and thickets in mallee and woodland.	No	Would Not Occur.	This species is locally extinct. No impact on this species will occur.
Gilbert's Potoroo <i>Potorous gilbertii</i>	S1	CR	Long-unburnt, dense shrubland on the valley slopes.	No	Would Not Occur.	This species is regionally extinct. No impact on this species will occur.
Western False Pipistrelle <i>Falsistrellus mackenziei</i>	P4	-	Wet sclerophyll forest dominated by karri and in high rainfall zones of the jarrah and marri forest.	Yes	Possibly Occurs.	Uncommon species but possibly forages along the Margaret River and in open areas on land. Unlikely to roost in the survey area due to a lack of suitable hollows especially within Lot 101 itself. The proposed small-scale development will not significantly impact on this species.
Water Rat <i>Hydromys chrysogaster</i>	P4	-	Permanent water, fresh, brackish or marine.	Yes	Possibly Occurs	Likely to forage within Margaret River and riverside vegetation (mostly outside of Lot 101) appears suitable for this species. Areas of preferred habitat are however not subject to any current development plans and therefore no impact on this species is anticipated.

Note: see Appendix A for conservation codes

8. CONCLUSION

The fauna assessment within the survey area was undertaken for the purposes of delineating and characterising the fauna habitats and faunal assemblages present. Targeted searches for western ringtail possums and black cockatoo habitat was also carried out.

With respect to native vertebrate fauna, 21 mammals (including nine bat species), 124 bird, 35 reptile, 10 frog species and six fish species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the survey area at times, a conclusion largely based on the presence of apparently suitable habitat. Fauna habitat quality within Lot 101 is however low as a consequence of historical clearing and development and only a subset of the fauna species predicted to occur in the wider area are considered likely to occur.

The assessment identified the presence the western ringtail possum and it is considered to potentially utilise most areas of Lot 101 where suitable vegetation persists. Within Lot 101 black cockatoo habitat was found to be limited in extent and/or of low quality. A single migratory species, the eastern osprey was recorded during the survey period and a possible nest site is present near the boundary of Lot 101.

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 survey area wasn't detected during the survey period.

The best quality and widest range of fauna habitats within the survey area are located outside of Lot 101. As a consequence, these areas (including the reserve areas of which they form a part of) are most likely to harbour the greatest variety of fauna species. Any development undertaken in Lot 101 is therefore considered as unlikely to impact significantly on the current status of any fauna species presently utilising the area.

In summary five vertebrate fauna species of conservation significance were positively identified as utilising the survey area for some purpose, these being:

- Forest Red-tailed Black Cockatoo – Vulnerable;
- Baudin's Black Cockatoo – Endangered;
- Carnaby's Black Cockatoo – Endangered;
- Eastern Osprey – Migratory; and
- Western Ringtail Possum – Critically Endangered.

A number of additional vertebrate species of conservation significance may also utilise the survey area, though, as no evidence of these species' presence was identified during the field survey, the status of some in the area remains uncertain. These species are:

- Pouched Lamprey – Priority 3;
- Black Bittern – Priority 2;
- Australian Little - Priority 2;
- Masked Owl – Priority 3;
- Peregrine Falcon – Schedule 7;
- South-western Brush-tailed Phascogale - Schedule 6;
- Quenda – Priority 4;
- Western False Pipistrelle – Priority 4;
- Water Rat – Priority 4.

As described previously, most of these species would not actually utilise Lot 101 due to a lack of suitable habitats, though they may frequent nearby areas.

One invertebrate species of conservation significance has also been assessed as possibly occurring based on available information. The Cape Leeuwin freshwater snail (Vulnerable) has been collected in national park areas north and south of the survey area (DBCA 2019b) so it must be regarded as a potential species though it is considered unlikely to occur within Lot 101 itself.

Overall Lot 101 has low biodiversity values and therefore impacts on fauna in general will be non-existent or negligible. Constraints on development within the subject site will largely be centred on the presence of habitat used or potentially used by threatened fauna species in particular the western ringtail possum.

The presence of this species should be taken into account during ongoing planning and subsequent development. To this end it is recommended that a fauna management plan be formulated for implementation prior to and during development. In particular the plan should define procedures for ensuring the retention and protection of existing WRP habitat wherever possible including protocols for ensuring western ringtail possums (and other fauna) are not injured or killed during site works.

It is also recommended that the tree containing the potential eastern osprey nest be specifically marked and fenced off during site works to minimise activity occurring nearby which may disturb nesting birds.

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FIGURES



Legend

- Survey Area
- National Park



Drawn: G. Harewood
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Scale: 1:50,000

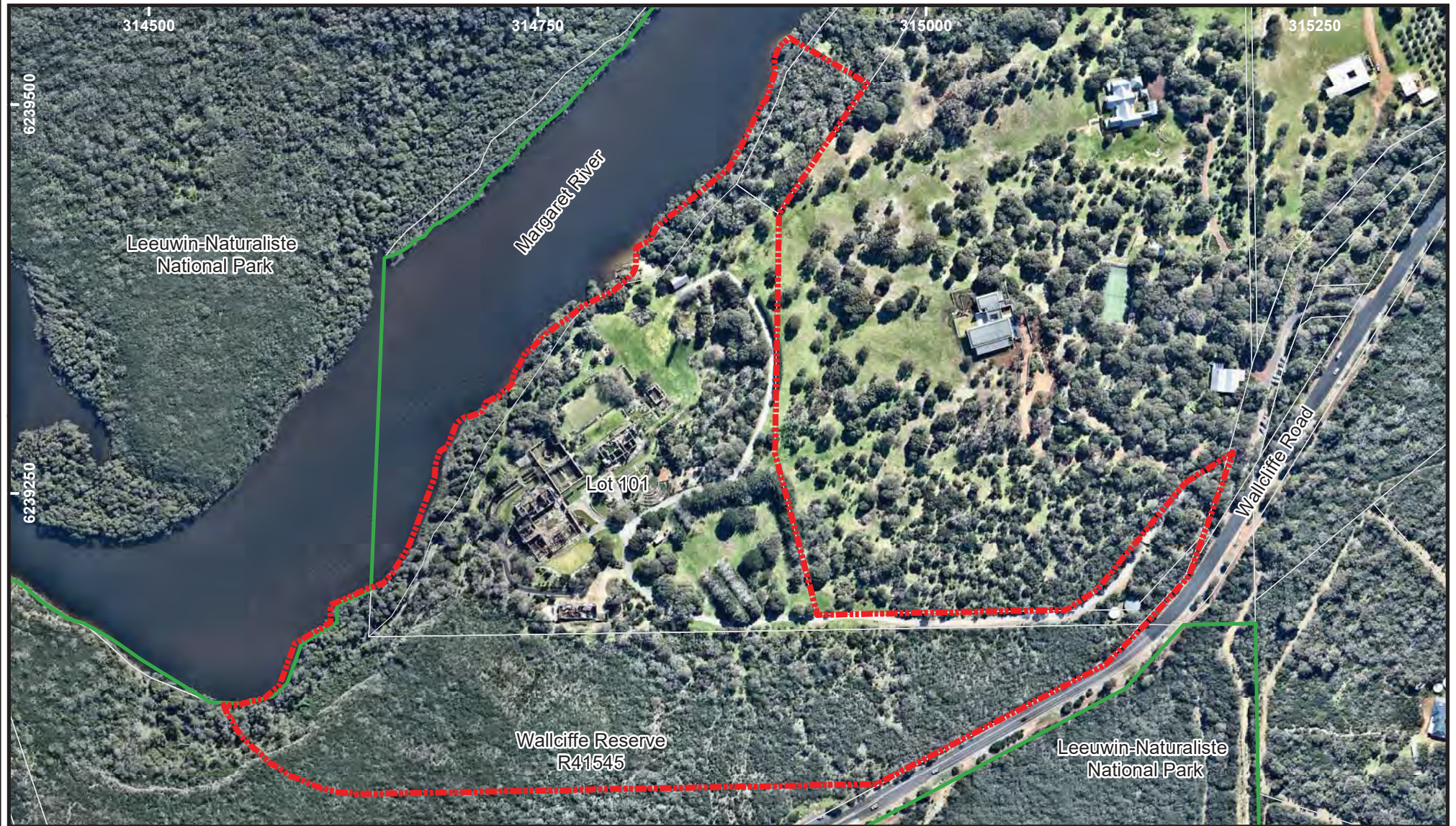
Projection/Coordinate System: UTM/MGA Zone 50

Lot 101 Wallcliffe Road
Prevelly

Survey Area and Surrounds

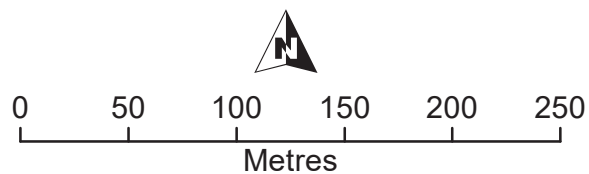
Figure: 1

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Survey Area
-  National Park



Drawn: G. Harewood
Date: April 2019
Scale: 1:3,500

Lot 101 Wallcliffe Road
Prevelly

Survey Area Aerial Photograph

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

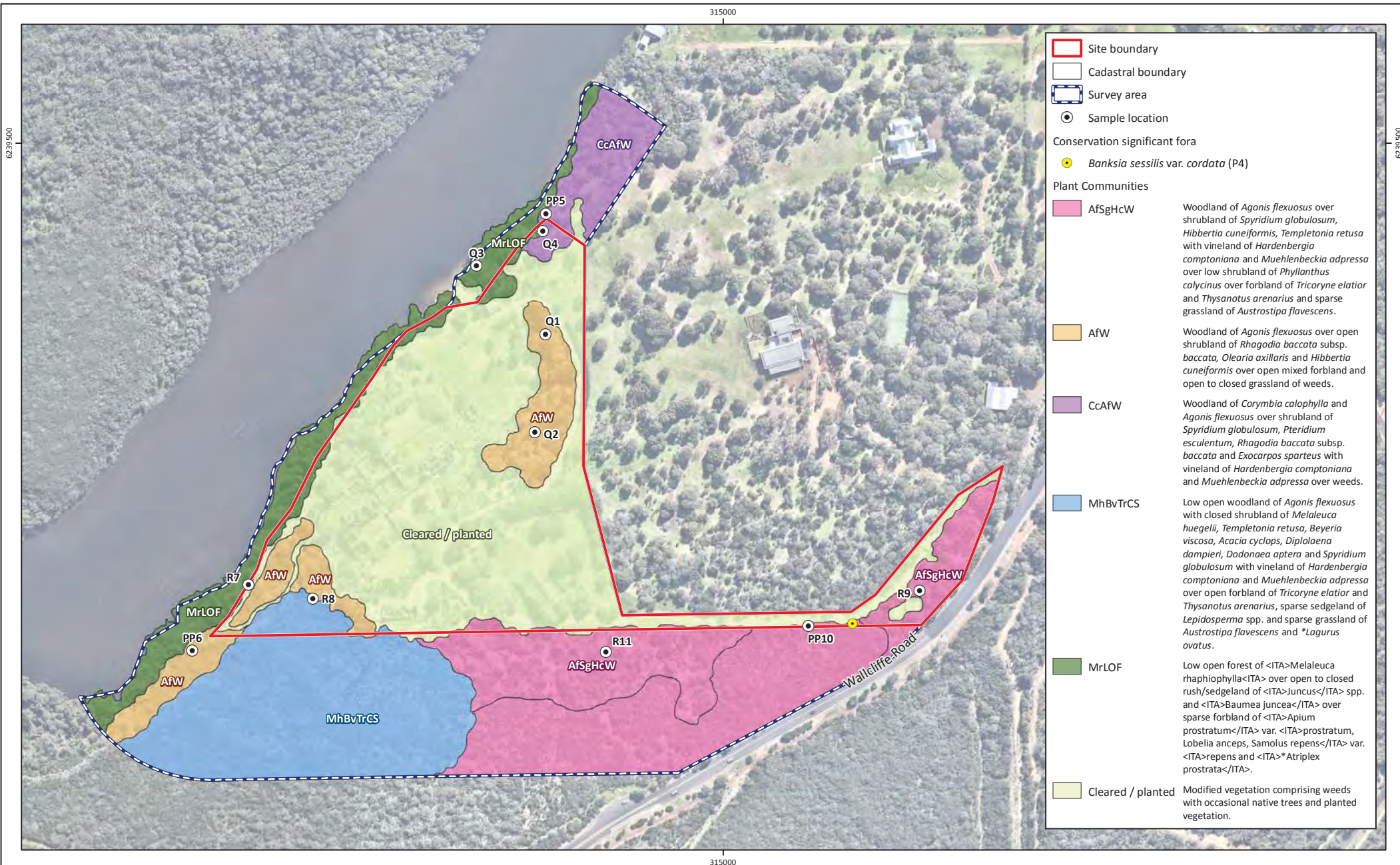


Figure 3: Plant Communities

Project: Spring Flora and Vegetation Assessment
Lot 101 Wallcliffe Road Amendment Support

Client: Wallcliffe House Pty Ltd

Plan Number:
EP18-128(01)-F03

Drawn: KNM

Date: 23/01/2019

Checked: SKP

Approved: TAA

Date: 11/02/2019

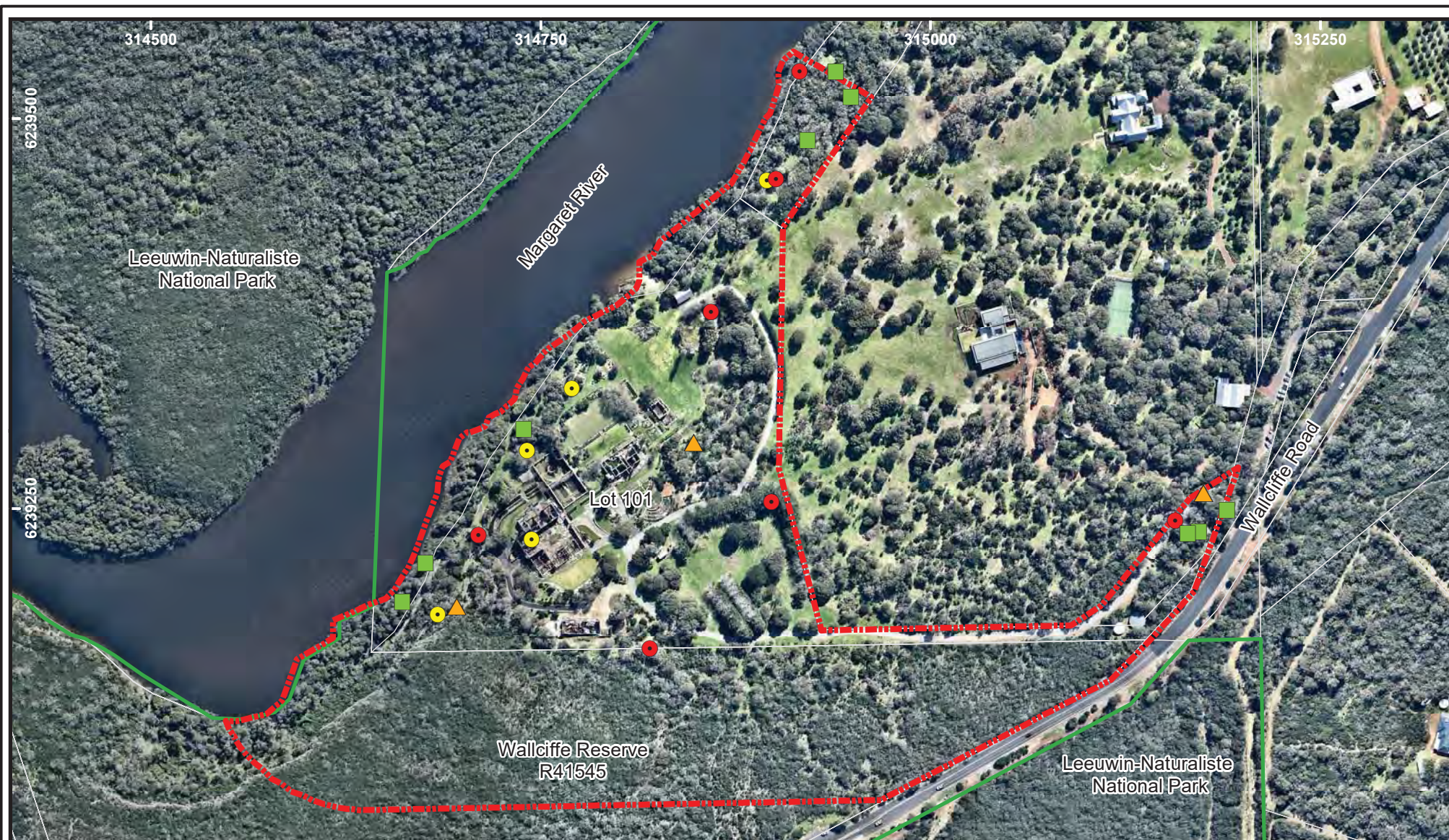


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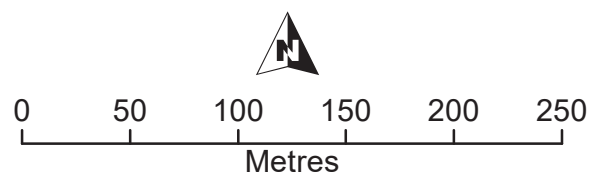
GDA 1994 MGA Zone 50

emerge
ASSOCIATES



Legend

- | | | | |
|---|---------------|---|-------------------------------|
|  | Survey Area |  | Western Ringtail Possum Drey |
|  | National Park |  | Western Ringtail Possum Scats |
| | |  | Western Ringtail Possum |
| | |  | Common Brushtail Possum |



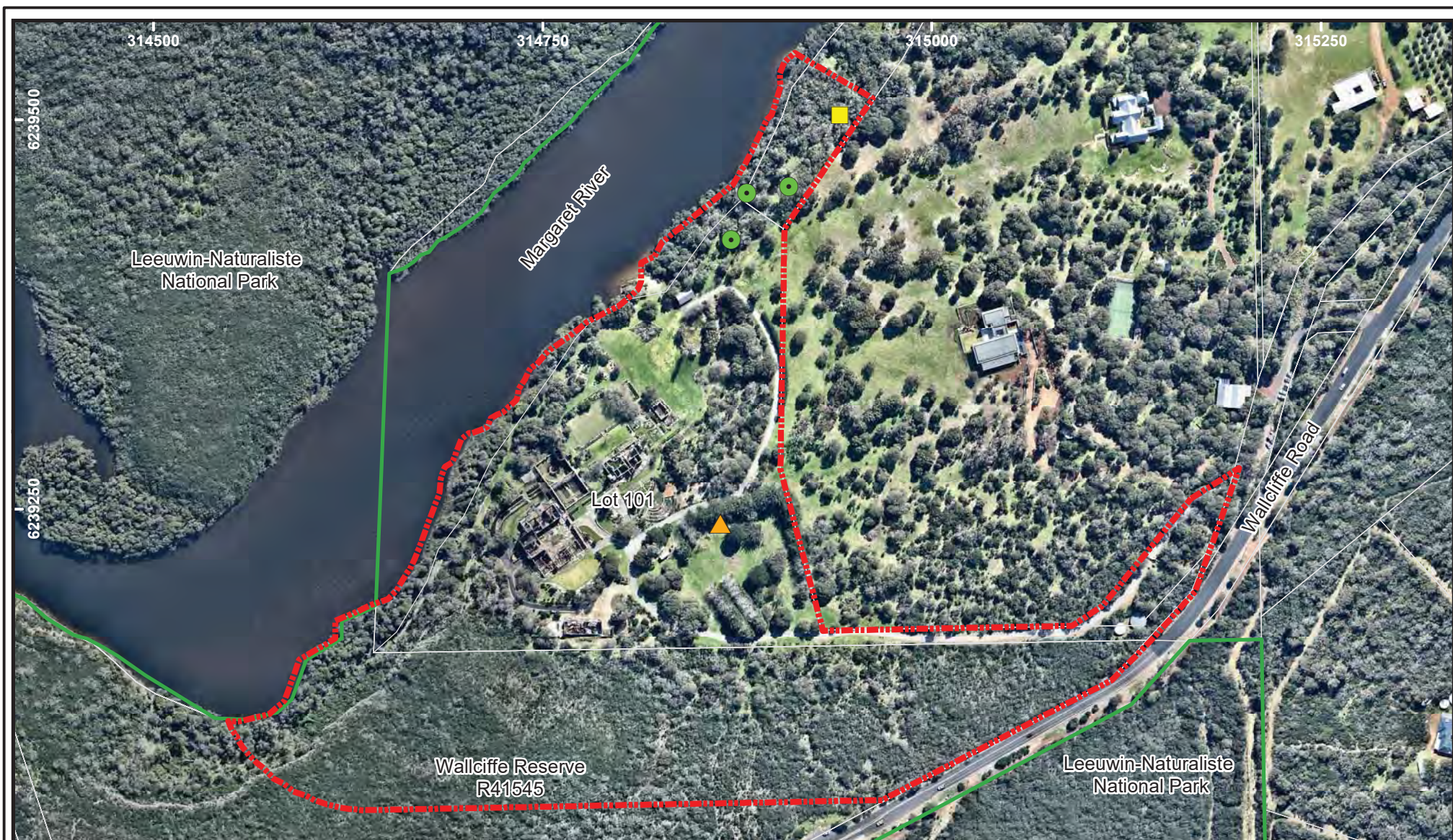
Drawn: G. Harewood
Date: April 2019
Scale: 1:3,500

Projection/Coordinate System: UTM/MGA Zone 50

Lot 101 Wallcliffe Road
Prevelly

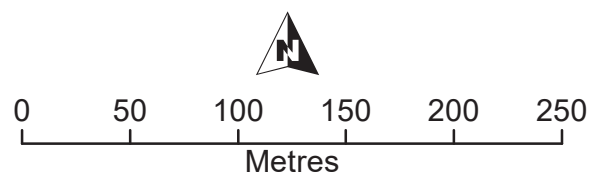
Possum Observations

Figure: 4



Legend

- Survey Area
- National Park
- Habitat Tree (DBH > 50cm)
- Foraging Evidence (Marri Fruits)
- ▲ Foraging Evidence (Pine Cones)



Drawn: G. Harewood
Date: April 2019
Scale: 1:3,500

Projection/Coordinate System: UTM/MGA Zone 50

Lot 101 Wallcliffe Road
Prevelly

Black Cockatoo Observations

Figure: 5

APPENDIX A

CONSERVATION CATEGORIES

EPBC Act (1999) Threatened Fauna Categories

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

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

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

Wildlife Conservation (Specially Protected Fauna) Notice 2018 Categories

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

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

Category	Code	Description
Schedule 1 (S1) Critically Endangered species	CR	Threatened species considered to be facing an extremely high risk of extinction in the wild in the immediate future.
Schedule 2 (S2) Endangered species	EN	Threatened species considered to be facing a very high risk of extinction in the wild in the near future.
Schedule 3 (S3) Vulnerable species	VU	Threatened species considered to be facing a high risk of extinction in the wild in the medium-term future.
Schedule 4 (S4) Presumed extinct species	EX	Species which have been adequately searched for and there is no reasonable doubt that the last member of the species has died.
Schedule 5 (S5) Migratory birds protected under an international agreement	MI	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds.
Schedule 6 (S6) Fauna that is of special conservation need as conservation dependent fauna	CD	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
Schedule 7 (S7) Other specially protected fauna.	OS	Fauna otherwise in need of special protection to ensure their conservation.

Western Australian DBCA Priority Fauna Categories

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

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

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

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

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

IUCN Red List Threatened Species Categories

The *IUCN Red List of Threatened Species*[™] 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

VERTEBRATE FAUNA OBSERVED OR POTENTIALLY PRESENT

Vertebrate Fauna Observed or Potentially Present

Lot 101 Wallcliffe Road, Prevelly

Compiled by Greg Harewood - April 2019
Recorded (Trapped/Sighted/Heard/Signs) = X

Harewood, G (2019). Fauna Assessment – Lot 101 Wallcliffe Road Prevelly Unpublished report for Emerge Associates.

Harewood, G. (2017): Fauna Assessment - Gracetown Fire Access Road. Unpublished report for MRWA.

Harewood (2009). Fauna Survey (Level 2). Gracetown. Unpublished report for Strategen.

ATA/ecologia ('01/06) - ecologia Environmental Consultants (2001) Location 413 Smiths Beach Fauna Assessment Survey, Unpublished report for ATA Environmental, ATA Environmental (2006) Location 413 Smiths Beach Fauna Assessment Survey, Unpublished report for Canal Rocks Properties.

ENV Australia (2007). Busselton to Margaret River Transmission Line – Biological Assessment. Unpublished report for Western Power.

Christensen, P., Annels, A., Liddelow, G. and Skinner,P. (1985). Vertebrate Fauna in The Southern Forests of Western Australia, A Survey. Forest Dept. of Western Australia, Bull. No. 94. Perth.

How, R.A., Dell, J. and Humphreys, W.F. (1987). The Ground Vertebrate Fauna of Coastal Areas between Busselton and Albany, Western Australia, Records of the WAM 13, 553-574.

DBCA (2019). NatureMap Database search. “By Circle” Centre = 114° 59' 43" E, 33° 58' 16" S (plus 20km buffer). Accessed 15 April 2019.

Class	Common	Conservation	Harewood	Harewood	Harewood	ATA/ecologia	ENV ('07)	Christensen	How ('87)	DBCA
Family	Name	Status	('19)	('17)	('09)	('01/06)	Busselton to	('85)	~7km NW	('19)
Species			Wallcliffe	Gracetown	Gracetown	Smith's Beach	Margaret River	Boranup	Margaret River	Nature Map

Fish

Atherinidae
Hardyheads or Silversides

Leptatherina wallacei Western Hardyhead

Gobiidae
Gobies

Pseudogobius olurum Swan River Goby

Percichthyidae
Basses and Cods

Bostockia porosa Nightfish

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

Class Family <i>Species</i>	Common Name	Conservation Status	Harewood (^{'19}) Wallcliffe	Harewood (^{'17}) Gracetown	Harewood (^{'09}) Gracetown	ATA/ecologia (^{'01/06}) Smith's Beach	ENV (^{'07}) Busselton to Margaret River	Christensen (^{'85}) Boranup	How (^{'87}) ~7km NW Margaret River	DBCA (^{'19}) Nature Map
Galaxiidae Galaxiids										
<i>Galaxias occidentalis</i>	Western Minnow									X
Geotriidae Pouched Lampreys										
<i>Geotria australis</i>	Pouched Lamprey	P3 DD								X
Nannopercidae Pygmy Perches										
<i>Edelia vittata</i>	Western Pygmy Perch									X
Poeciliidae Livebearers										
<i>Gambusia holbrooki</i>	Mosquito Fish	Introduced								

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Class Family Species	Common Name	Conservation Status	Harewood (^{'19}) Wallcliffe	Harewood (^{'17}) Gracetown	Harewood (^{'09}) Gracetown	ATA/ecologia (^{'01/06}) Smith's Beach	ENV (^{'07}) Busselton to Margaret River	Christensen (^{'85}) Boranup	How (^{'87}) ~7km NW Margaret River	DBCA (^{'19}) Nature Map
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Amphibians

Myobatrachidae

Ground or Burrowing Frogs

<i>Crinia georgiana</i>	Quacking Frog	LC					X			X
<i>Crinia glauerti</i>	Glauert`s Froglet	LC					X			X
<i>Crinia pseudinsignifera</i>	Bleating Froglet	LC		X						X
<i>Geocrinia leai</i>	Lea`s Frog	LC		X			X			X
<i>Heleioporus eyrei</i>	Moaning Frog	LC		X		X	X	X	X	X
<i>Heleioporus inornatus</i>	Whooping Frog	LC					X			X
<i>Limnodynastes dorsalis</i>	Banjo Frog	LC			X	X	X	X	X	X
<i>Metacrinia nichollsi</i>	Nicholls` Toadlet	LC					X			X

Hylidae

Tree or Water-Holding Frogs

<i>Litoria adelaidensis</i>	Slender Tree Frog	LC					X			X
<i>Litoria moorei</i>	Motorbike Frog	LC					X			X

Reptiles

Chelidae

Side-necked Tortoises

<i>Chelodina colliei</i>	SW Snake-necked Turtle	LC								X
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Gekkonidae Geckoes										
<i>Christinus marmoratus</i>	Marbled Gecko	LC			X	X	X	X	X	X
Pygopodidae Legless Lizards										
<i>Aprasia pulchella</i>	Pretty Worm Lizard	LC				X			X	X
<i>Delma australis</i>	Marbel-faced Delma	LC				X				
<i>Lialis burtonis</i>	Common Snake Lizard	LC								X
<i>Pygopus lepidopodus</i>	Southern Scalefoot	LC			X			X		X
Agamidae Dragon Lizards										
<i>Pogona minor</i>	Western Bearded Dragon	LC			X	X			X	
Varanidae Monitor's or Goanna's										
<i>Varanus rosenbergi</i>	Heath Monitor	LC			X	X	X			X

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Scincidae Skinks										
<i>Acritoscincus trilineatus</i>	South-western Cool Skink	LC			X	X	X		X	X
<i>Cryptoblepharus buchananii</i>	Fence Skink	LC				X		X		X
<i>Ctenotus catenifer</i>	Chain-striped Heath Ctenotus	LC								X
<i>Ctenotus impar</i>	SW Odd-striped Ctenotus	LC				X		X	X	X
<i>Ctenotus labillardieri</i>	Red-legged Skink	LC				X	X	X	X	X
<i>Egernia kingii</i>	King's Skink	LC				X	X			X
<i>Egernia luctuosa</i>	Mourning Skink	LC					X			
<i>Egernia napoleonis</i>	Salmon-bellied Skink	LC			X	X	X	X	X	X
<i>Hemiergis gracilipes</i>	SW Mulch Skink	LC								X
<i>Hemiergis peronii tridactyla</i>	Three-toed Mulch Skink	LC			X	X	X		X	
<i>Lerista distinguenda</i>	SW Four-toed Lerista	LC				X				X
<i>Lerista elegans</i>	West Coast Four-toed Lerista	LC			X				X	X
<i>Lerista microtis</i>	SW Five-toed Lerista	LC					X			X
<i>Menetia greyii</i>	Dwarf Skink	LC			X	X		X		X
<i>Morethia lineoocellata</i>	Western Pale-flecked Morethia	LC			X	X	X		X	X

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<i>Morethia obscura</i>	Dusky Morethia	LC								X
<i>Tiliqua rugosa rugosa</i>	Western Bobtail	LC			X	X	X	X	X	
Typhlopidae Blind Snakes										
<i>Anilius australis</i>	Southern Blind Snake	LC				X	X			
Boidae Pythons, Boas										
<i>Morelia spilota imbricata</i>	Southern Carpet Python	LC			X	X				
Elapidae Elapid Snakes										
<i>Echiopsis curta</i>	Bardick	LC				X			X	X
<i>Elapognathus coronatus</i>	Crowned Snake	LC			X	X		X		X
<i>Notechis scutatus</i>	Tiger Snake	LC								X
<i>Parasuta gouldii</i>	Gould's Hooded Snake	LC								X
<i>Parasuta nigriceps</i>	Black-backed Snake	LC								X
<i>Pseudonaja affinis</i>	Dugite	LC			X		X	X	X	X
<i>Rhinoplocephalus bicolor</i>	Square-nosed Snake	LC								X

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Birds										
Phasianidae Quails, Pheasants										
<i>Coturnix pectoralis</i>	Stubble Quail	LC								
<i>Coturnix ypsilophora</i>	Brown Quail	LC								
Anatidae Geese, Swans, Ducks										
<i>Anas castanea</i>	Chestnut Teal	LC								
<i>Anas gracilis</i>	Grey Teal	LC					X			X
<i>Anas platyrhynchos</i>	Mallard	Introduced								X
<i>Anas rhynchotis</i>	Australasian Shoveler	Bh LC								
<i>Anas superciliosa</i>	Pacific Black Duck	LC					X			X
<i>Aythya australis</i>	Hardhead	Bh LC								
<i>Biziura lobata</i>	Musk Duck	Bh LC								X
<i>Chenonetta jubata</i>	Australian Wood Duck	LC					X			X
<i>Cygnus atratus</i>	Black Swan	LC								
<i>Malacorhynchus membranaceus</i>	Pink-eared Duck	Bh LC								
<i>Tadorna tadornoides</i>	Australian Shelduck	LC					X			X

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Podicipedidae Grebes										
<i>Poliocephalus poliocephalus</i>	Hoary-headed Grebe	LC								
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe	LC								X
Anhingidae Darters										
<i>Anhinga novaehollandiae</i>	Australian Darter	LC								
Phalacrocoracidae Cormorants										
<i>Phalacrocorax carbo</i>	Great Cormorant	LC								X
<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant	LC								
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	LC								X
<i>Phalacrocorax varius</i>	Pied Cormorant	LC								X
Pelecanidae Pelicans										
<i>Pelecanus conspicillatus</i>	Australian Pelican	LC								X

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Ardeidae Herons, Egrets, Bitterns										
<i>Ardea alba</i>	Great Egret	CA JA LC								
<i>Ardea pacifica</i>	White-necked Heron	LC								
<i>Egretta novaehollandiae</i>	White-faced Heron	LC					X			X
<i>Ixobrychus flavicollis</i>	Black Bittern (SW pop.)	P2 Bp LC								X
<i>Ixobrychus minutus</i>	Australian Little Bittern	P4 Bp LC								
<i>Nycticorax caledonicus</i>	Rufous Night Heron	Bp LC								X
Threskiornithidae Ibises, Spoonbills										
<i>Platalea flavipes</i>	Yellow-billed Spoonbill	LC								
<i>Threskiornis molucca</i>	Australian White Ibis	LC					X			
<i>Threskiornis spinicollis</i>	Straw-necked Ibis	LC					X			X

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Accipitridae Kites, Goshawks, Eagles, Harriers										
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	LC								X
<i>Accipiter fasciatus</i>	Brown Goshawk	LC								X
<i>Aquila audax</i>	Wedge-tailed Eagle	LC								X
<i>Aquila morphnoides</i>	Little Eagle	LC			X					
<i>Circus approximans</i>	Swamp Harrier	LC								X
<i>Elanus caeruleus</i>	Black-shouldered Kite	LC					X			
<i>Haliastur sphenurus</i>	Whistling Kite	LC				X		X		X
<i>Hamirostra isura</i>	Square-tailed Kite	LC			X					X
<i>Pandion cristatus</i>	Eastern Osprey	S5 Mig LC	X							X
Falconidae Falcons										
<i>Falco berigora</i>	Brown Falcon	LC				X		X		X
<i>Falco cenchroides</i>	Australian Kestrel	LC				X	X	X		X
<i>Falco longipennis</i>	Australian Hobby	LC					X			X
<i>Falco peregrinus</i>	Peregrine Falcon	S7 LC								X

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Rallidae Rails, Crakes, Swamphens, Coots										
<i>Fulica atra</i>	Eurasian Coot	LC	X							X
<i>Gallinula tenebrosa</i>	Dusky Moorhen	Bh LC								
<i>Gallirallus philippensis</i>	Buff-banded Rail	LC								
<i>Porphyrio porphyrio</i>	Purple Swamphen	LC								X
<i>Porzana fluminea</i>	Australian Spotted Crake	LC								
<i>Porzana pusilla</i>	Baillon`s Crake	LC								
<i>Porzana tabuensis</i>	Spotless Crake	LC								X
Turnicidae Button-quails										
<i>Turnix varia</i>	Painted Button-quail	LC			X					
Laridae Gulls, Terns										
<i>Larus novaehollandiae</i>	Silver Gull	LC			X	X				X

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Columbidae Pigeons, Doves										
<i>Columba livia</i>	Domestic Pigeon	Introduced								X
<i>Ocyphaps lophotes</i>	Crested Pigeon	LC								X
<i>Phaps chalcoptera</i>	Common Bronzewing	LC		X	X			X		X
<i>Phaps elegans</i>	Brush Bronzewing	LC		X	X	X		X		X
<i>Streptopelia senegalensis</i>	Laughing Turtle-Dove	Introduced								
Cacatuidae Cockatoos, Corellas										
<i>Cacatua sanguinea gymnopsis</i>	Little Corella	Introduced					X			X
<i>Cacatua tenuirostris</i>	Eastern Long-billed Corella	Introduced								
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black Cockatoo	S3 VU	X				X			X
<i>Calyptorhynchus baudinii</i>	Baudin`s Black Cockatoo	S2 EN EN	X	X	X	X	X	X		X
<i>Calyptorhynchus latirostris</i>	Carnaby`s Black Cockatoo	S2 EN EN	X							X
<i>Eolophus roseicapilla</i>	Galah	LC		X			X			

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Psittacidae Parrots										
<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet	LC					X			
<i>Neophema elegans</i>	Elegant Parrot	LC			X	X				X
<i>Neophema petrophila</i>	Rock Parrot	Bh LC						X		X
<i>Platycercus icterotis icterotis</i>	Western Rosella (Western ssp)	LC		X	X	X	X	X		
<i>Platycercus spurius</i>	Red-capped Parrot	LC			X	X	X			X
<i>Platycercus zonarius</i>	Australian Ringneck Parrot	LC	X	X	X	X	X	X		X
<i>Polytelis anthopeplus</i>	Regent Parrot	LC								X
Cuculidae Parasitic Cuckoos										
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo	LC		X	X		X	X		X
<i>Chrysococcyx basalís</i>	Horsfield`s Bronze Cuckoo	LC			X			X		
<i>Chrysococcyx lucidus</i>	Shining Bronze Cuckoo	LC			X					X
<i>Cuculus pallidus</i>	Pallid Cuckoo	LC								
Strigidae Hawk Owls										
<i>Ninox novaeseelandiae</i>	Boobook Owl	LC			X	X		X		

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Tytonidae Barn Owls										
<i>Tyto alba</i>	Barn Owl	LC						X		
<i>Tyto n. novaehollandiae</i>	Masked Owl (SW pop.)	P3								
Podargidae Frogmouths										
<i>Podargus strigoides</i>	Tawny Frogmouth	LC		X		X		X		X
Caprimulgidae Nightjars										
<i>Eurostopodus argus</i>	Spotted Nightjar	LC								
Aegothelidae Owlet-nightjars										
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	LC								X
Halcyonidae Tree Kingfishers										
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Introduced		X	X	X	X	X		X
<i>Todiramphus sanctus</i>	Sacred Kingfisher	LC						X		X
Meropidae Bee-eaters										
<i>Merops ornatus</i>	Rainbow Bee-eater	JA LC			X		X			X

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Maluridae Fairy Wrens, GrassWrens										
<i>Malurus elegans</i>	Red-winged Fairy-wren	LC					X	X		X
<i>Malurus splendens</i>	Splendid Fairy-wren	LC		X	X	X	X	X		X
<i>Stipiturus malachurus</i>	Southern Emu-wren	Bh LC			X	X		X		X
Pardalotidae Pardalotes, Bristlebirds, Scrubwrens, Gerygones, Thornbills										
<i>Acanthiza apicalis</i>	Broad-tailed Thornbill	LC		X	X	X	X	X		X
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	LC		X			X			X
<i>Acanthiza inornata</i>	Western Thornbill	LC				X				X
<i>Gerygone fusca</i>	Western Gerygone	LC			X		X			X
<i>Pardalotus punctatus</i>	Spotted Pardalote	LC								X
<i>Pardalotus striatus</i>	Striated Pardalote	LC					X			X
<i>Sericornis maculatus</i>	Spotted Scrubwren	LC		X	X	X	X	X		X
<i>Smicrornis brevirostris</i>	Weebill	LC					X			X

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Meliphagidae Honeyeaters, Chats										
<i>Acanthorhynchus superciliosus</i>	Western Spinebill	LC				X				X
<i>Anthochaera carunculata</i>	Red Wattlebird	LC	X	X	X	X	X	X		X
<i>Anthochaera lunulata</i>	Western Little Wattlebird	LC								X
<i>Lichenostomus virescens</i>	Singing Honeyeater	LC				X				
<i>Lichmera indistincta</i>	Brown Honeyeater	LC				X				X
<i>Melithreptus chloropsis</i>	Gilbert's Honeyeater	LC						X		X
<i>Phylidonyris nigra</i>	White-cheeked Honeyeater	LC								
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	LC			X	X		X		X
Petroicidae Australian Robins										
<i>Eopsaltria australis</i>	Western Yellow Robin	LC					X			X
<i>Eopsaltria georgiana</i>	White-breasted Robin	LC		X	X	X	X	X		X
<i>Petroica multicolor</i>	Scarlet Robin	LC				X	X	X		
Neosittidae Sitellas										
<i>Daphoenositta chrysoptera</i>	Varied Sittella	LC					X			X

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Pachycephalidae Crested Shrike-tit, Crested Bellbird, Shrike Thrushes, Whistlers										
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	LC		X	X		X			X
<i>Falcunculus frontatus</i>	Western Shrike-tit	LC								X
<i>Pachycephala occidentalis</i>	Western Whistler	LC		X	X	X	X	X		
<i>Pachycephala rufiventris</i>	Rufous Whistler	LC		X				X		X
Dicruridae Monarchs, Magpie Lark, Flycatchers, Fantails, Drongo										
<i>Grallina cyanoleuca</i>	Magpie-lark	LC		X			X	X		X
<i>Myiagra inquieta</i>	Restless Flycatcher	Bh LC						X		X
<i>Rhipidura fuliginosa</i>	Grey Fantail	LC		X	X	X	X	X		
<i>Rhipidura leucophrys</i>	Willie Wagtail	LC		X	X	X	X	X		X
Campephagidae Cuckoo-shrikes, Trillers										
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	LC			X	X	X	X		X
<i>Lalage sueurii</i>	White-winged Triller	LC								

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Artamidae Woodswallows, Butcherbirds, Currawongs										
<i>Artamus cinereus</i>	Black-faced Woodswallow	LC					X			X
<i>Artamus cyanopterus</i>	Dusky Woodswallow	LC			X			X		X
<i>Cracticus tibicen</i>	Australian Magpie	LC		X	X	X	X	X		X
<i>Cracticus torquatus</i>	Grey Butcherbird	LC		X		X	X			X
<i>Strepera versicolor</i>	Grey Currawong	LC						X		X
Corvidae Ravens, Crows										
<i>Corvus coronoides</i>	Australian Raven	LC	X	X	X	X	X	X		X
Motacillidae Old World Pipits, Wagtails										
<i>Anthus novaeseelandiae</i>	Australian Pipit	LC			X		X	X		
Passeridae Grass Finches, Mannikins, Sparrows										
<i>Stagonopleura oculata</i>	Red-eared Firetail	LC								X
Dicaeidae Flowerpeckers										
<i>Dicaeum hirundinaceum</i>	Mistletoebird	LC								

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Hirundinidae Swallows, Martins										
<i>Hirundo neoxena</i>	Welcome Swallow	LC		X	X	X	X			X
<i>Hirundo nigricans</i>	Tree Martin	LC					X			
Sylviidae Old World Warblers										
<i>Cincloramphus cruralis</i>	Brown Songlark	LC								
<i>Cincloramphus mathewsi</i>	Rufous Songlark	LC								
Zosteropidae White-eyes										
<i>Zosterops lateralis</i>	Silvereye	LC		X	X	X	X	X		X
Mammals										
Tachyglossidae Echidnas										
<i>Tachyglossus aculeatus</i>	Echidna	LC								
Dasyuridae Carnivorous Marsupials										
<i>Antechinus flavipes</i>	Yellow-footed Antechinus	LC								X
<i>Phascogale tapoatafa wambenger</i>	SW Brush-tailed Phascogale	S6								X
<i>Sminthopsis griseoventer</i>	Grey-bellied Dunnart	LC		X	X		X	X		

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Peramelidae Bandicoots										
<i>Isoodon fusciventer</i>	Quenda	P4 LC		X	X		X	X		X
Phalangeridae Brushtail Possums, Cuscuses										
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	LC	X	X		X	X	X		X
Burramyidae Pygmy Possums										
<i>Cercartetus concinnus</i>	Western Pygmy-possum	LC				X				X
Tarsipedidae Honey Possum										
<i>Tarsipes rostratus</i>	Honey Possum	LC			X	X				X
Pseudocheiridae Ringtail Possums										
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	S1 CR CR	X	X	X	X				X
Macropodidae Kangaroos, Wallabies										
<i>Macropus fuliginosus</i>	Western Grey Kangaroo	LC	X	X	X	X	X	X		X
Molossidae Freetail Bats										
<i>Austronomus australis</i>	White-striped Freetail-bat	LC				X	X			
<i>Ozimops kitcheneri</i>	Western Freetail Bat	LC				X	X			

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Vespertilionidae Ordinary Bats										
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	LC				X	X	X		X
<i>Chalinolobus morio</i>	Chocolate Wattled Bat	LC			X	X	X		X	X
<i>Falsistrellus mackenziei</i>	Western False Pipistrelle	P4 NT			X		X	X		X
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	LC			X		X			X
<i>Nyctophilus gouldi</i>	Gould's Long-eared Bat	LC								
<i>Nyctophilus major major</i>	Western Long-eared Bat	DD					X			
<i>Vespadelus regulus</i>	Southern Forest Bat	LC			X	X	X	X		X
Muridae Rats, Mice										
<i>Hydromys chrysogaster</i>	Water Rat	P4 LC					X			X
<i>Mus musculus</i>	House Mouse	Introduced			X	X		X		
<i>Rattus fuscipes</i>	Western Bush Rat	LC		X	X	X	X	X	X	X
<i>Rattus rattus</i>	Black Rat	Introduced		X			X	X		X
Canidae Dogs, Foxes										
<i>Canis lupus</i>	Dog	Introduced			X	X				
<i>Vulpes vulpes</i>	Red Fox	Introduced		X		X	X	X		X

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Felidae Cats										
<i>Felis catus</i>	Cat	Introduced		X	X	X		X		X
Leporidae Rabbits, Hares										
<i>Oryctolagus cuniculus</i>	Rabbit	Introduced		X	X	X	X	X		

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APPENDIX C

DBCA & EPBC DATABASE SEARCH RESULTS

NatureMap - Wallcliffe House

Created By Greg Harewood on 15/04/2019

Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 114° 59' 43" E, 33° 58' 16" S
Buffer 20km
Group By Species Group

Species Group	Species	Records
Amphibian	11	416
Bird	151	7603
Fish	46	94
Invertebrate	215	1934
Mammal	44	917
Reptile	37	275
TOTAL	504	11239

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Amphibian				
1.	25398 <i>Crinia georgiana</i> (Quacking Frog)			
2.	25399 <i>Crinia glauerti</i> (Clicking Frog)			
3.	25401 <i>Crinia pseudinsignifera</i> (Bleating Froglet)			
4.	25403 <i>Geocrinia alba</i> (White-bellied Frog)		T	
5.	25404 <i>Geocrinia leai</i> (Ticking Frog)			
6.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
7.	25411 <i>Heleioporus inornatus</i> (Whooping Frog)			
8.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
9.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
10.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
11.	25419 <i>Metacrinia nichollsi</i> (Forest Toadlet)			
Bird				
12.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
13.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
14.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
15.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
16.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
17.	24281 <i>Accipiter cirrocephalus</i> subsp. <i>cirrocephalus</i> (Collared Sparrowhawk)			
18.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
19.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
20.	25544 <i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
21.	24301 <i>Aegotheles cristatus</i> subsp. <i>cristatus</i> (Australian Owlet-nightjar)			
22.	24312 <i>Anas gracilis</i> (Grey Teal)			
23.	24313 <i>Anas platyrhynchos</i> (Mallard)			
24.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
25.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
26.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
27.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
28.	24599 <i>Anthus australis</i> subsp. <i>australis</i> (Australian Pipit)			
29.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
30.	41326 <i>Ardenna carneipes</i> (Flesh-footed Shearwater, Fleshy-footed Shearwater)		T	
31.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
32.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
33.	24358 <i>Atrichornis clamosus</i> (Noisy Scrub-bird, tjimiluk)		T	
34.	<i>Barnardius zonarius</i>			
35.	24319 <i>Biziura lobata</i> (Musk Duck)			
36.	24359 <i>Burhinus grallarius</i> (Bush Stone-curlew)			
37.	25713 <i>Cacatua galerita</i> (Sulphur-crested Cockatoo)			
38.	24723 <i>Cacatua pastinator</i> subsp. <i>butleri</i> (Butler's Corella)			
39.	25716 <i>Cacatua sanguinea</i> (Little Corella)			

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40.	25598	<i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
41.	24427	<i>Cacomantis flabelliformis</i> subsp. <i>flabelliformis</i> (Fan-tailed Cuckoo)			
42.	42307	<i>Cacomantis pallidus</i> (Pallid Cuckoo)			
43.	24780	<i>Calidris alba</i> (Sanderling)		IA	
44.	24788	<i>Calidris ruficollis</i> (Red-necked Stint)		IA	
45.	25717	<i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
46.	24731	<i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black Cockatoo)		T	
47.	24733	<i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)		T	
48.	24734	<i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)		T	
49.	48400	<i>Calyptorhynchus</i> sp. (white-tailed black cockatoo)		T	
50.	25575	<i>Charadrius leschenaultii</i> (Greater Sand Plover)		T	
51.	24377	<i>Charadrius ruficapillus</i> (Red-capped Plover)			
52.	24321	<i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
53.		<i>Chroicocephalus novaehollandiae</i>			
54.	24432	<i>Chrysococcyx lucidus</i> subsp. <i>plagusus</i> (Shining Bronze Cuckoo)			
55.	24288	<i>Circus approximans</i> (Swamp Harrier)			
56.	25675	<i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
57.	24399	<i>Columba livia</i> (Domestic Pigeon)	Y		
58.	25568	<i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
59.	25592	<i>Corvus coronoides</i> (Australian Raven)			
60.	24417	<i>Corvus coronoides</i> subsp. <i>perplexus</i> (Australian Raven)			
61.	25595	<i>Cracticus tibicen</i> (Australian Magpie)			
62.	25596	<i>Cracticus torquatus</i> (Grey Butcherbird)			
63.	30901	<i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
64.	25673	<i>Daphoenositta chrysoptera</i> (Varied Sittella)			
65.	24439	<i>Dasyornis broadbenti</i> subsp. <i>litoralis</i> (Rufous Bristlebird, Rufous Bristlebird (SW WA))		□	
66.	24470	<i>Dromaius novaehollandiae</i> (Emu)			
67.		<i>Egretta novaehollandiae</i>			
68.		<i>Elanus axillaris</i>			
69.	47937	<i>Elseornis melanops</i> (Black-fronted Dotterel)			
70.		<i>Eolophus roseicapillus</i>			
71.	24651	<i>Eopsaltria australis</i> subsp. <i>griseogularis</i> (Western Yellow Robin)			
72.	24652	<i>Eopsaltria georgiana</i> (White-breasted Robin)			
73.	24567	<i>Epthianura albifrons</i> (White-fronted Chat)			
74.	25744	<i>Eudyptes chrysocome</i> (Rockhopper Penguin)			
75.	25621	<i>Falco berigora</i> (Brown Falcon)			
76.	24471	<i>Falco berigora</i> subsp. <i>berigora</i> (Brown Falcon)			
77.	25622	<i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
78.	25623	<i>Falco longipennis</i> (Australian Hobby)			
79.	25624	<i>Falco peregrinus</i> (Peregrine Falcon)		S	
80.	24475	<i>Falco peregrinus</i> subsp. <i>macropus</i> (Australian Peregrine Falcon)		S	
81.	25677	<i>Falcunculus frontatus</i> (Crested Shrike-tit)			
82.	25727	<i>Fulica atra</i> (Eurasian Coot)			
83.	25530	<i>Gerygone fusca</i> (Western Gerygone)			
84.	24443	<i>Grallina cyanoleuca</i> (Magpie-lark)			
85.	25627	<i>Haematopus fuliginosus</i> (Sooty Oystercatcher)			
86.	24487	<i>Haematopus longirostris</i> (Pied Oystercatcher)			
87.	24295	<i>Haliastur sphenurus</i> (Whistling Kite)			
88.	24296	<i>Hamirostra isura</i> (Square-tailed Kite)			
89.	47965	<i>Hieraaetus morphnoides</i> (Little Eagle)			
90.	24491	<i>Hirundo neoxena</i> (Welcome Swallow)			
91.	48587	<i>Hydroprogne caspia</i> (Caspian Tern)		IA	
92.	25562	<i>Ixobrychus flavicollis</i> (Black Bittern)			
93.	24511	<i>Larus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Silver Gull)			
94.	25638	<i>Larus pacificus</i> (Pacific Gull)			
95.	24557	<i>Leipoa ocellata</i> (Malleefowl)		T	
96.	25661	<i>Lichmera indistincta</i> (Brown Honeyeater)			
97.	24582	<i>Lichmera indistincta</i> subsp. <i>indistincta</i> (Brown Honeyeater)			
98.		<i>Lophocincla isura</i>			
99.	25650	<i>Malurus elegans</i> (Red-winged Fairy-wren)			
100.	25654	<i>Malurus splendens</i> (Splendid Fairy-wren)			
101.	25663	<i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
102.	24587	<i>Melithreptus chloropsis</i> (Western White-naped Honeyeater)			
103.	24598	<i>Merops ornatus</i> (Rainbow Bee-eater)			
104.		<i>Microcarbo melanoleucos</i>			
105.	48008	<i>Morus serrator</i> (Australasian Gannet)			
106.	25610	<i>Myiagra inquieta</i> (Restless Flycatcher)			
107.	24738	<i>Neophema elegans</i> (Elegant Parrot)			

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108.	24739	<i>Neophema petrophila</i> (Rock Parrot)			
109.	25564	<i>Nycticorax caledonicus</i> (Rufous Night Heron)			
110.	24407	<i>Ocyphaps lophotes</i> (Crested Pigeon)			
111.	25680	<i>Pachycephala rufiventris</i> (Rufous Whistler)			
112.	48591	<i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
113.	25681	<i>Pardalotus punctatus</i> (Spotted Pardalote)			
114.	25682	<i>Pardalotus striatus</i> (Striated Pardalote)			
115.	24630	<i>Pardalotus striatus</i> subsp. <i>westraliensis</i> (Striated Pardalote)			
116.	24674	<i>Pavo cristatus</i> (Common Peafowl, Indian Peafowl)	Y		
117.	24648	<i>Pelecanus conspicillatus</i> (Australian Pelican)			
118.	48061	<i>Petrochelidon nigricans</i> (Tree Martin)			
119.	48066	<i>Petroica boodang</i> (Scarlet Robin)			
120.	25697	<i>Phalacrocorax carbo</i> (Great Cormorant)			
121.	24667	<i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
122.	25699	<i>Phalacrocorax varius</i> (Pied Cormorant)			
123.	24409	<i>Phaps chalcoptera</i> (Common Bronzewing)			
124.	25587	<i>Phaps elegans</i> (Brush Bronzewing)			
125.	48071	<i>Phylidonyris niger</i> (White-cheeked Honeyeater)			
126.	24596	<i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
127.	25720	<i>Platycercus icterotis</i> (Western Rosella)			
128.	24745	<i>Platycercus icterotis</i> subsp. <i>icterotis</i> (Western Rosella)			
129.	24747	<i>Platycercus spurius</i> (Red-capped Parrot)			
130.	24750	<i>Platycercus zonarius</i> subsp. <i>semitorquatus</i> (Twenty-eight Parrot)			
131.	25703	<i>Podargus strigoides</i> (Tawny Frogmouth)			
132.	25722	<i>Polytelis anthopeplus</i> (Regent Parrot)			
133.	25731	<i>Porphyrio porphyrio</i> (Purple Swamphen)			
134.	24771	<i>Porzana tabuensis</i> (Spotless Crane)			
135.	25579	<i>Psophodes nigrogularis</i> (Western Whipbird)		T	
136.	24388	<i>Psophodes nigrogularis</i> subsp. <i>nigrogularis</i> (Western Whipbird (western heath))		T	
137.	24711	<i>Puffinus assimilis</i> subsp. <i>assimilis</i> (Little Shearwater)			
138.		<i>Purpureicephalus spurius</i>			
139.	48096	<i>Rhipidura albiscapa</i> (Grey Fantail)			
140.	25614	<i>Rhipidura leucophrys</i> (Willie Wagtail)			
141.	25534	<i>Sericornis frontalis</i> (White-browed Scrubwren)			
142.	24279	<i>Sericornis frontalis</i> subsp. <i>maculatus</i> (White-browed Scrubwren)			
143.	30948	<i>Smicromis brevirostris</i> (Weebill)			
144.	24645	<i>Stagonopleura oculata</i> (Red-eared Firetail)			
145.	24522	<i>Sterna bergii</i> (Crested Tern)			
146.	25655	<i>Stipiturus malachurus</i> (Southern Emu-wren)			
147.	24554	<i>Stipiturus malachurus</i> subsp. <i>westernensis</i> (Southern Emu-wren)			
148.	25597	<i>Strepera versicolor</i> (Grey Currawong)			
149.	25705	<i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
150.	24331	<i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
151.	34135	<i>Thalassarche cauta</i> (Shy Albatross)		T	
152.	34007	<i>Thalassarche chlororhynchos</i> (Atlantic Yellow-nosed Albatross)		T	
153.	44607	<i>Thalassarche melanophris</i> (Black-browed Albatross)		T	
154.	48597	<i>Thalasseus bergii</i> (Crested Tern)		IA	
155.	48135	<i>Thinornis rubricollis</i> (Hooded Plover, Hooded Dotterel)		P4	
156.	24845	<i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
157.	25549	<i>Todiramphus sanctus</i> (Sacred Kingfisher)			
158.	25723	<i>Trichoglossus haematodus</i> (Rainbow Lorikeet)			
159.	48147	<i>Turnix varius</i> (Painted Button-quail)			
160.	25764	<i>Tyto novaehollandiae</i> (Masked Owl)			
161.	24855	<i>Tyto novaehollandiae</i> subsp. <i>novaehollandiae</i> (Masked Owl (southwest))		P3	
162.	25765	<i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			
ish					
163.		? ?			
164.		<i>Acanthaluteres vittiger</i>			
165.		<i>Acanthistius pardalotus</i>			
166.		<i>Aetapcus maculatus</i>			
167.		<i>Afurcagobius suppositus</i>			
168.		<i>Alabes brevis</i>			
169.		<i>Aracana aurita</i>			
170.		<i>Arripis georgiana</i>			
171.		<i>Arripis truttacea</i>			
172.		<i>Atherinosoma wallacei</i>			
173.		<i>Carassius auratus</i>			
174.		<i>Coris auricularis</i>			
175.		<i>Cristiceps australis</i>			
176.		<i>Dactylophora nigricans</i>			

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177.	<i>Edelia vittata</i>			
178.	34028 <i>Galaxias occidentalis</i> (Western Minnow)			
179.	34026 <i>Galaxiella munda</i> (mud minnow, western dwarf galaxias)		T	
180.	34030 <i>Geotria australis</i> (Pouched Lamprey)		P3	
181.	<i>Halichoeres brownfieldi</i>			
182.	<i>Helcogramma decurrens</i>			
183.	<i>Heteroclinus</i> sp.			
184.	<i>Heterodontus portusjacksoni</i>			
185.	<i>Hippocampus</i> sp.			
186.	<i>Histiophryne cryptacanthus</i>			
187.	<i>Lepidoblennius marmoratus</i>			
188.	<i>Lepidoperca occidentalis</i>			
189.	<i>Lissocampus runa</i>			
190.	<i>Meuschenia flavolineata</i>			
191.	<i>Meuschenia galii</i>			
192.	<i>Meuschenia hippocrepis</i>			
193.	34033 <i>Nannatherina balstoni</i> (Balston's Pygmy Perch)		T	
194.	<i>Nannoperca vittata</i>			
195.	<i>Naucrates ductor</i>			
196.	<i>Neopataecus waterhousii</i>			
197.	<i>Odax acroptilus</i>			
198.	<i>Oplegnathus woodwardi</i>			
199.	<i>Pelsartia humeralis</i>			
200.	<i>Pictilabrus laticlavus</i>			
201.	<i>Platycephalus</i> sp.			
202.	<i>Plectranthias alleni</i>			
203.	<i>Pseudogobius olorum</i>			
204.	<i>Pseudolabrus</i> sp.			
205.	<i>Pterygotrigla polyommata</i>			
206.	<i>Schuettea woodwardi</i>			
207.	<i>Scobinichthys granulatus</i>			
208.	<i>Siphonognathus beddomei</i>			

Invertebrate

209.	<i>Acariformes</i> sp.			
210.	<i>Acritoptila globosa</i>			
211.	<i>Aeshnidae</i> sp.			
212.	<i>Akamptogonus novarae</i>			
213.	<i>Akamptogonus novarae?</i>			Y
214.	<i>Allothreua maculata</i>			
215.	<i>Alotanyus dalyupensis</i>			
216.	<i>Amphisopodidae</i> sp.			
217.	<i>Aname mainae</i>			
218.	<i>Aname tepperi</i>			
219.	<i>Ancylidae</i> sp.			
220.	<i>Arachnura higginsi</i>			
221.	<i>Araneus cyphoxis</i>			
222.	<i>Araneus eburneiventris</i>			
223.	<i>Araneus eburnus</i>			
224.	<i>Araneus senicaudatus</i>			
225.	<i>Archaeosynthemis leachii</i>			
226.	<i>Archaeosynthemis occidentalis</i>			
227.	<i>Archaeosynthemis spiniger</i>			
228.	<i>Archichauliodes</i> sp.			
229.	<i>Argiope trifasciata</i>			
230.	<i>Arkys walckenaeri</i>			
231.	<i>Arrenuridae</i> sp.			
232.	<i>Artoria cingulipes</i>			
233.	<i>Artoria flavimana</i>			
234.	<i>Artoria linnaei</i>			
235.	<i>Artoria taeniifera</i>			
236.	<i>Asadipus kunderang</i>			
237.	<i>Athericidae</i> sp.			
238.	<i>Aturidae</i> sp.			
239.	<i>Austracantha minax</i>			
240.	<i>Australomimetes diabolicus</i>			
241.	<i>Australomimetes tasmaniensis</i>			
242.	<i>Austroaeschna anacantha</i>			
243.	34110 <i>Austroassiminea lethra</i> (Cape Leeuwin Freshwater Snail)		T	
244.	<i>Austrochiltonia</i> sp.			
245.	<i>Badumna microps</i>			

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246.	<i>Baetidae</i> sp.			
247.	<i>Baiami tegearioides</i>			
248.	<i>Baiami volucris</i>			
249.	<i>Ballarra longipalpus</i>			
250.	47873 <i>Bertmainius opimus</i> (western pygmy trapdoor spider)		P3	
251.	<i>Bibulmena kadjina</i>			
252.	<i>Bithyniidae</i> sp.			
253.	<i>Botryocladus freemani</i>			
254.	<i>Caenidae</i> sp.			
255.	<i>Calymmachernes angulatus</i>			
256.	<i>Carabidae</i> sp.			
257.	<i>Ceratopogonidae</i> sp.			
258.	<i>Cercophonius granulatus</i>			
259.	<i>Cercophonius sulcatus</i>			
260.	<i>Chaussieria warregense</i>			
261.	33939 <i>Cherax cainii</i> (Marron)			
262.	<i>Cherax crassimanus</i>			
263.	<i>Cherax destructor</i>			
264.	<i>Cherax quinquecarinatus</i>			
265.	33940 <i>Cherax tenuimanus</i> (Margaret River hairy marron, Margaret River Marron)		T	
266.	<i>Chironominae</i> sp.			
267.	<i>Chironomus</i> aff. <i>alternans</i> (V24) (CB)			
268.	<i>Chironomus tepperi</i>			
269.	<i>Cladocera</i> (non-daphniidae)			
270.	<i>Cladocera</i> (unident.)			
271.	<i>Coenagrionidae</i> sp.			
272.	<i>Conicochernes crassus</i>			
273.	<i>Copepoda</i> sp.			
274.	<i>Corduliidae</i> sp.			
275.	<i>Corixidae</i> sp.			
276.	<i>Cormocephalus aurantiipes</i>			
277.	<i>Cormocephalus hartmeyer</i>			
278.	<i>Cormocephalus strigosus</i>			
279.	<i>Corydalidae</i> sp.			
280.	<i>Cricotopus</i> 'parbicinctus'			
281.	<i>Crustulina bicrucata</i>			
282.	<i>Culicidae</i> sp.			
283.	<i>Curculionidae</i> sp.			
284.	<i>Cyclosa trilobata</i>			
285.	<i>Dicrotendipes</i> sp. A (V47) (SAP)			
286.	<i>Dugesidae</i> sp.			
287.	<i>Dytiscidae</i> sp.			
288.	<i>Emertonella maga</i>			
289.	<i>Empididae</i> sp.			
290.	<i>Enchytraeidae</i> sp.			
291.	33945 <i>Engaewa pseudoreducta</i> (Margaret River Burrowing Crayfish)		T	
292.	<i>Eodelena lapidicola</i>			
293.	<i>Ephydriidae</i> sp.			
294.	<i>Eriophora biapicata</i>			
295.	<i>Geogarypus taylori</i>			
296.	<i>Glossiphoniidae</i> sp.			
297.	<i>Gripopterygidae</i> sp.			
298.	<i>Gyrinidae</i> sp.			
299.	<i>Harrisius</i> sp. B (SFM)			
300.	<i>Hemicorduliidae</i> sp.			
301.	<i>Henicops dentatus</i>			
302.	<i>Holasteron aspinosum</i>			
303.	<i>Hydraenidae</i> sp.			
304.	<i>Hydrobiosidae</i> sp.			
305.	<i>Hydrometridae</i> sp.			
306.	<i>Hydrophilidae</i> sp.			
307.	<i>Hydropsychidae</i> sp.			
308.	<i>Hydroptilidae</i> sp.			
309.	<i>Hyriidae</i> sp.			
310.	<i>Isopoda leishmanni</i>			
311.	<i>Ixodes australiensis</i>			
312.	<i>Karaops ellenae</i>			
313.	33980 <i>Kawaniphila pachomai</i> (Grey Vernal Katydid (southwest), cricket)		P1	
314.	<i>Kiefferulus interinctus</i>			
315.	<i>Lagynochthonius australicus</i>			

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316.	<i>Lampona brevipes</i>			
317.	<i>Lampona cylindrata</i>			
318.	<i>Lamponella ainslie</i>			
319.	<i>Latrodectus hasseltii</i>			
320.	<i>Lectrides parilis</i>			
321.	<i>Lepidoptera (non-pyralid)</i>			
322.	<i>Leptoceridae sp.</i>			
323.	<i>Leptoperla australica</i>			
324.	<i>Leptophlebiid genus S sp. AV1</i>			
325.	<i>Leptophlebiidae sp.</i>			
326.	<i>Libellulidae sp.</i>			
327.	<i>Lycosa gilberta</i>			
328.	<i>Lymnaeidae sp.</i>			
329.	<i>Maratus pavonis</i>			
330.	<i>Megaloptera sp.</i>			
331.	<i>Megapodagrionidae sp.</i>			
332.	<i>Mesoveliidae sp.</i>			
333.	<i>Microvelia (Austromicrovelia) australiensis</i>			
334.	<i>Microvelia sp.</i>			
335.	<i>Missulena granulosa</i>			
336.	<i>Mituliodon tarantulinus</i>			
337.	<i>Naididae sp.</i>			
338.	<i>Neboissophlebia occidentalis</i>			
339.	<i>Nematoda sp.</i>			
340.	<i>Newmanoperla exigua</i>			
341.	<i>Notalina sp.</i>			
342.	<i>Notalina sp. AV15 (PSW)</i>			
343.	<i>Notonectidae sp.</i>			
344.	<i>Notoperata tenax</i>			
345.	<i>Nousia sp. AV16</i>			
346.	<i>Nunciella aspera</i>			
347.	<i>Nyungara bunni</i>			
348.	<i>Ochthebius sp.</i>			
349.	<i>Oligochaeta sp.</i>			
350.	<i>Oniscidae sp.</i>			
351.	<i>Orthocladinae 'woodminer' (SAP)</i>			
352.	<i>Orthocladinae sp.</i>			
353.	<i>Ostracoda (unident.)</i>			
354.	<i>Oxidae sp.</i>			
355.	<i>Oxyopes gracilipes</i>			
356.	<i>Palaemonidae sp.</i>			
357.	<i>Paralimnophyes pullulus (V42)</i>			
358.	<i>Paramerina levidensis</i>			
359.	<i>Parastacidae sp.</i>			
360.	<i>Pentastemon intermedium</i>			
361.	<i>Perthidae sp.</i>			
362.	<i>Pholcus phalangioides</i>			
363.	<i>Phreatoicidae sp.</i>			
364.	<i>Phreodrilidae sp.</i>			
365.	<i>Physidae sp.</i>			
366.	<i>Pinkfloydia harveii</i>			
367.	<i>Planorbidae sp.</i>			
368.	<i>Polypedium nr. convexum (SAP)</i>			
369.	<i>Polypedium watsoni</i>			
370.	<i>Prionosternum nitidiceps</i>			
371.	<i>Protochelifera cavernarum</i>			
372.	<i>Pseudotyranochthonius giganteus</i>			
373.	<i>Pyralidae sp.</i>			
374.	<i>Raveniella peckorum</i>			
375.	<i>Rheotanytarsus sp. (SFM)</i>			
376.	<i>Rheotanytarsus trivittatus</i>			
377.	<i>Rheotanytarsus underwoodi</i>			
378.	<i>Richardsonianidae sp.</i>			
379.	<i>Riekoperla occidentalis</i>			
380.	<i>Riethia v4</i>			
381.	<i>Sciomyzidae sp.</i>			
382.	<i>Scirtidae sp.</i>			
383.	<i>Scolopendra laeta</i>			
384.	<i>Servaea spinibarbis</i>			
385.	<i>Simaetha tenuior</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
386.	<i>Simuliidae</i> sp.			
387.	<i>Siphonotus flavomarginatus</i>			
388.	<i>Skusella</i> "V12 ex-WA" (Cranston)			
389.	<i>Sphaeriidae</i> sp.			
390.	<i>Spinicrus minimus</i>			
391.	<i>Spinicrus porongorupensis</i>			
392.	<i>Staphylinidae</i> sp.			
393.	<i>Steatoda grossa</i>			
394.	<i>Sternopriscus</i> sp.			
395.	<i>Storena formosa</i>			
396.	<i>Storosa tetrica</i>			
397.	<i>Stratiomyidae</i> sp.			
398.	<i>Styloniscidae</i> sp.			
399.	<i>Supunna picta</i>			
400.	<i>Synthemistidae</i> sp.			
401.	<i>Tabanidae</i> sp.			
402.	<i>Talitridae</i> sp.			
403.	<i>Tamopsis perthensis</i>			
404.	<i>Tanypodinae</i> sp.			
405.	<i>Tanytarsus aff manleyensis</i>			
406.	<i>Tanytarsus</i> nr K5			
407.	<i>Tanytarsus palmatus</i>			
408.	<i>Taphiassa robertsi</i>			
409.	<i>Tasmanicosa leuckartii</i>			
410.	<i>Tasmanocoenis tillyardi</i>			
411.	<i>Telephlebiidae</i> sp.			
412.	<i>Temnocephalidea</i> sp.			
413.	<i>Thaumaleidae</i> sp.			
414.	<i>Thienemanniella</i> sp. (V19) (SAP)			
415.	<i>Tipulidae</i> sp.			
416.	<i>Trachytrema castaneum</i>			
417.	33995 <i>Trichosternus relictus</i> (a ground beetle (Margaret River), beetle)		P3	Y
418.	<i>Triplectides</i> sp. AV1 (SFM)			
419.	<i>Triplectides</i> sp. AV21 (SFM)			
420.	<i>Urodacus novaehollandiae</i>			
421.	<i>Veliidae</i> sp.			
422.	<i>Venator immansueta</i>			
423.	34113 <i>Westralunio carteri</i> (Carter's Freshwater Mussel)		T	

Mammal

424.	24088 <i>Antechinus flavipes</i> subsp. <i>leucogaster</i> (Yellow-footed Antechinus, Mardo)			
425.	24209 <i>Arctocephalus tropicalis</i> (Subantarctic fur-seal)		T	
426.	24049 <i>Balaenoptera musculus</i> subsp. <i>intermedia</i> (Antarctic Blue Whale)		T	
427.	24161 <i>Bettongia lesueur</i> subsp. <i>graii</i> (Boodie (inland), Burrowing Bettong (inland))		□	
428.	24162 <i>Bettongia penicillata</i> subsp. <i>ogilbyi</i> (Woylie, Brush-tailed Bettong)		T	
429.	<i>Capreolus capreolus</i>			Y
430.	24086 <i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)			
431.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattled Bat)			
432.	24187 <i>Chalinolobus morio</i> (Chocolate Wattled Bat)			
433.	24092 <i>Dasyurus geoffroyi</i> (Chuditch, Western Quoll)		T	
434.	24258 <i>Equus caballus</i> (Horse)	Y		
435.	24189 <i>Falsistrellus mackenziei</i> (Western False Pipistrelle, Western Falsistrelle)		P4	
436.	24041 <i>Felis catus</i> (Cat)	Y		
437.	24215 <i>Hydromys chrysogaster</i> (Water-rat, Rakali)		P4	
438.	48588 <i>Isodon fusciventer</i> (Quenda, southwestern brown bandicoot)		P4	
439.	24132 <i>Macropus fuliginosus</i> (Western Grey Kangaroo)			
440.	24168 <i>Macrotis lagotis</i> (Bilby, Dalgyte, Ninu)		T	
441.	24078 <i>Mesoplodon grayi</i> (Gray's Beaked Whale)			
442.	24213 <i>Mirounga leonina</i> (Southern Elephant Seal)			
443.	24146 <i>Myrmecobius fasciatus</i> (Numbat, Walpurti)		T	
444.	48024 <i>Notamacropus eugenii</i> subsp. <i>derbianus</i> (Tammar Wallaby, Tammar)		P4	
445.	48022 <i>Notamacropus irma</i> (Western Brush Wallaby)		P4	
446.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			
447.	24142 <i>Petrogale lateralis</i> subsp. <i>lateralis</i> (Black-flanked Rock-wallaby, Black-footed Rock-wallaby)		T	
448.	48401 <i>Petrogale</i> sp. (rock wallaby)		T	
449.	48070 <i>Phascogale tapoatafa</i> subsp. <i>wambenger</i> (South-western Brush-tailed Phascogale, Wambenger)		S	
450.	24073 <i>Physeter macrocephalus</i> (Sperm Whale)		T	
451.	24163 <i>Potorous gilbertii</i> (Gilbert's Potoroo)		T	
452.	24164 <i>Potorous platyops</i> (Broad-faced Potoroo)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
453.	24166 <i>Pseudocheirus occidentalis</i> (Western Ringtail Possum, ngwayir)		☐	
454.	24236 <i>Pseudomys fieldi</i> (Shark Bay Mouse, Djoongari)		T	
455.	24241 <i>Pseudomys shortridgei</i> (Heath Mouse, Heath Rat, Dayang)		T	
456.	24243 <i>Rattus fuscipes</i> (Western Bush Rat)			
457.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
458.	24145 <i>Setonix brachyurus</i> (Quokka)		T	
459.	24109 <i>Sminthopsis dolichura</i> (Little long-tailed Dunnart)			
460.	24111 <i>Sminthopsis gilberti</i> (Gilbert's Dunnart)			
461.	24259 <i>Sus scrofa</i> (Pig)	Y		
462.	24167 <i>Tarsipes rostratus</i> (Honey Possum, Noolbenger)			
463.	25521 <i>Trichosurus vulpecula</i> (Common Brushtail Possum)			
464.	24158 <i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum)			
465.	24069 <i>Tursiops truncatus</i> (Bottlenose Dolphin)			
466.	24206 <i>Vespadelus regulus</i> (Southern Forest Bat)			
467.	24040 <i>Vulpes vulpes</i> (Red Fox)	Y		

Reptile

468.	42368 <i>Acritoscincus trilineatus</i> (Western Three-lined Skink)			
469.	24990 <i>Aprasia pulchella</i> (Granite Worm-lizard)			
470.	25335 <i>Caretta caretta</i> (Loggerhead Turtle)		T	
471.	43380 <i>Chelodina collei</i> (South-western Snake-necked Turtle)			
472.	24980 <i>Christinus marmoratus</i> (Marbled Gecko)			
473.	30893 <i>Cryptoblepharus buehneri</i>			
474.	25031 <i>Ctenotus catenifer</i>			
475.	25047 <i>Ctenotus impar</i>			
476.	25049 <i>Ctenotus labillardieri</i>			
477.	25251 <i>Echiopsis curta</i> (Bardick)			
478.	25096 <i>Egernia kingii</i> (King's Skink)			
479.	25100 <i>Egernia napoleonis</i>			
480.	25250 <i>Elapognathus coronatus</i> (Crowned Snake)			
481.	30919 <i>Hemiergis gracilipes</i> (skink)			
482.	25118 <i>Hemiergis peronii</i> subsp. <i>tridactyla</i>			
483.	43384 <i>Hydrophis platurus</i> (Yellow-bellied Seasnake)			
484.	25131 <i>Lerista distinguenda</i>			
485.	25133 <i>Lerista elegans</i>			
486.	25154 <i>Lerista microtis</i> subsp. <i>microtis</i>			
487.	25155 <i>Lerista muelleri</i>			
488.	25005 <i>Lialis burtonis</i>			
489.	41416 <i>Liopholis pulchra</i> subsp. <i>pulchra</i> (South-western Rock Skink, Spectacled Rock Skink)			
490.	42413 <i>Lissolepis luctuosa</i> (Western Swamp Skink)			
491.	25184 <i>Menetia greyii</i>			
492.	25240 <i>Morelia spilota</i> subsp. <i>imbricata</i> (Carpet Python)			
493.	25191 <i>Morethia lineocellata</i>			
494.	25192 <i>Morethia obscura</i>			
495.	25252 <i>Notechis scutatus</i> (Tiger Snake)			
496.	25253 <i>Parasuta gouldii</i>			
497.	25255 <i>Parasuta nigriceps</i>			
498.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
499.	25259 <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
500.	25008 <i>Pygopus lepidopodus</i> (Common Scaly Foot)			
501.	30818 <i>Rhinoplocephalus bicolor</i> (Square-nosed Snake)			
502.	25519 <i>Tiliqua rugosa</i>			
503.	25207 <i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			
504.	25225 <i>Varanus rosenbergi</i> (Heath Monitor)			

Conservation Codes

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

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



EPBC Act Protected Matters Report

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

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

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

Report created 15/04/19 13:03:16

[Summary](#)

[Details](#)

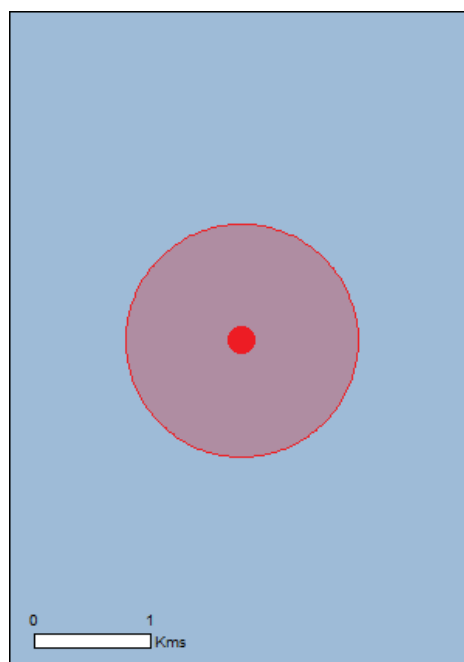
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

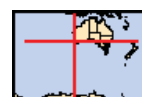
[Acknowledgements](#)



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

[Coordinates](#)

Buffer 1.0m



Summary

Matters of National Environmental Significance

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

World Heritage Properties	None
National Heritage Places	None
Wetlands of International Importance	None
Great Barrier Reef Marine Park	None
Commonwealth Marine Area	None
Listed Threatened Ecological Communities	None
Listed Threatened Species	39
Listed Migratory Species	39

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	60
Whales and Other Cetaceans	13
Critical Habitats	None
Commonwealth Reserves Terrestrial	None
Australian Marine Parks	None

Extra Information

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

State and Territory Reserves	1
Regional Forest Agreements	1
Invasive Species	23
Nationally Important Wetlands	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		Resource Information
Name	Status	Type of Presence
Birds		
Anous tenuirostris melanops Australian Lesser Noddy 26000	Vulnerable	Species or species habitat may occur within area
Botaurus poiciloptilus Australasian Bittern 1001	Endangered	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot 855	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper 856	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Barrak 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
Diomedea amsterdamensis Amsterdam Albatross 64405	Endangered	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross 66471	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross 89221	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross 89223	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross 64456	Endangered	Foraging, feeding or related behaviour likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit baueri, Western Alaskan Bar-tailed Godwit 86380	Vulnerable	Species or species habitat may occur within

Name	Status	Type of Presence area
<i>Imosa lapponica mienbieri</i> Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit menbieri 86432	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant Petrel, Southern Giant Petrel 1060	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel 1061	Vulnerable	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
Pachyptila turtur subantarctica Fairy Prion Southern 64445	Vulnerable	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern 82950	Vulnerable	Breeding likely to occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross 82345	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta steady White-capped Albatross 82344	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-brooded Albatross 64459	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-brooded Albatross 66472	Vulnerable	Species or species habitat may occur within area
Mammals		
Balaenoptera musculus Blue Whale 36	Endangered	Species or species habitat likely to occur within area
Bettongia penicillata ogilbyi Woylie 66844	Endangered	Species or species habitat may occur within area
Dasyurus geoffroii Chuditch, Western quoll 330	Vulnerable	Species or species habitat likely to occur within area
Eubalaena australis Southern Right Whale 40	Endangered	Breeding known to occur within area
Megaptera novaeangliae Humpback Whale 38	Vulnerable	Congregation or aggregation known to occur within area
Neophoca cinerea Australian Sea Lion, Australian Sea Lion 22	Vulnerable	Species or species habitat may occur within area
Pseudocheirus occidentalis Western Ringtail Possum, Ngayir, Womp, Woder, Ngoor, Ngoolangit 25911	Critically Endangered	Species or species habitat may occur within area
Plants		
Drakaea micrantha Dwarf Hammer-orchid 56755	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Sphenotoma drummondii Mountain Paperbush 1160	Endangered	Species or species habitat may occur within area

Reptiles

Caretta caretta Loggerhead Turtle 1763	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle 1765	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth 1768	Endangered	Breeding likely to occur within area
Natator depressus Flatback Turtle 59257	Vulnerable	Breeding likely to occur within area

Sharks

Carcharias taurus - West coast population Grey Nurse Shark - West coast population 68752	Vulnerable	Species or species habitat known to occur within area
Carcharodon carcharias White Shark, Great White Shark 64470	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark 66680	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information](#)

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

Name	Threatened	Type of Presence
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Migratory Marine Birds

Apus pacificus Fork-tailed Swift 678		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater 82404		Species or species habitat likely to occur within area
Diomedea amsterdamensis Amsterdam Albatross 64405	Endangered	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross 66471	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross 89221	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross 89223	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross 64456	Endangered	Foraging, feeding or related behaviour likely to occur within area
Hydroprogne caspia Caspian Tern 808		Foraging, feeding or related behaviour known to occur within area
Macronektes giganteus Southern Giant Petrel, Southern Giant Petrel 1060	Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Macronectes halli Northern Giant Petrel 1061	Vulnerable	Species or species habitat may occur within area
Pseudobulweria pyramalis Bridled Tern 82845		Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta Tasmanian Shy Albatross 89224	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross 64459	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophrys Black-browed Albatross 66472	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross 64462	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale 75529	Endangered	Breeding known to occur within area
Balaenoptera edeni Bryde's Whale 35		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale 36	Endangered	Species or species habitat likely to occur within area
Caperea marginata Pygmy Right Whale 39		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark 64470	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle 1763	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle 1765	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth 1768	Endangered	Breeding likely to occur within area
Fagenorhynchus obscurus Dusky Dolphin 43		Species or species habitat may occur within area
Lamna nasus Porbeagle, Mackerel Shark 83288		Species or species habitat may occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray 84994		Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray 84995		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale 38	Vulnerable	Congregation or aggregation known to occur within area

Name	Threatened	Type of Presence
Natator depressus Flatback Turtle 59257	Vulnerable	Breeding likely to occur within area
Pseudorca crassidens Killer Whale, Orca 46		Species or species habitat may occur within area
Rhincodon typus Whale Shark 66680	Vulnerable	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 may occur within area
Calidris canutus Red Knot, Knot 855	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper 856	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper 858		Species or species habitat may occur within area
Limosa lapponica Bar-tailed Godwit 844		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 Bald Eagle 952		Breeding known to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		Resource Information
Species is listed under a different scientific name on the EPBC Act Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper 59309		Species or species habitat likely to occur within area
Anous tenuirostris melanops Australian Lesser Noddy 26000	Vulnerable	Species or species habitat may occur within area
Apus pacificus Fork-tailed Shearwater 678		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret 59541		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret 59542		Species or species

Name	Threatened	Type of Presence
Calidris acuminata Sharp-tailed Sandpiper 1874		habitat may occur within area Species or species habitat may occur within area
Calidris canutus Red-throated, Red-throated 1855	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper 1856	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper 1858		Species or species habitat may occur within area
Diomedea amsterdamensis Amsterdam Albatross 164405	Endangered	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross 166471	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross 189221	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross 189223	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross 164456	Endangered	Foraging, feeding or related behaviour likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle 1943		Species or species habitat likely to occur within area
Imosa lapponica Bar-tailed Godwit 1844		Species or species habitat may occur within area
Macronectes giganteus Southern Giant Petrel, Southern Giant Petrel 11060	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel 11061	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater 1670		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew 1847	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion 11066		Species or species habitat known to occur within area
Pandion haliaetus Osprey 1952		Breeding known to occur within area
Puffinus assimilis Little Shearwater 159363		Foraging, feeding or related behaviour known to occur within area

Name	Threatened	Type of Presence
Puffinus carneipes Fleshfooted Shearwater, Fleshyfooted Shearwater 1043		Species or species habitat likely to occur within area
Sterna anaethetus Bridled Tern 1814		Foraging, feeding or related behaviour likely to occur within area
Sterna caspia Caspian Tern 159467		Foraging, feeding or related behaviour known to occur within area
Thalassarche cauta Tasmanian Shy Albatross 189224	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross 164459	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross 166472	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross 164462	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thinornis rubricollis Dooded Plover 159510		Species or species habitat known to occur within area
Fish		
Acentronura australe Southern Pygmy Pipehorse 166185		Species or species habitat may occur within area
Campichthys galei Gale's Pipefish 166191		Species or species habitat may occur within area
Ceraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish 166227		Species or species habitat may occur within area
Hippocampus angustus Western Spiny Seahorse, Narrobelled Seahorse 166234		Species or species habitat may occur within area
Hippocampus breviceps Shorthead Seahorse, Shortsnouted Seahorse 166235		Species or species habitat may occur within area
Hippocampus subelongatus West Australian Seahorse 166722		Species or species habitat may occur within area
Istiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ringback Pipefish 166243		Species or species habitat may occur within area
Hissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish 166249		Species or species habitat may occur within area
Hissocampus fatilous Prophet's Pipefish 166250		Species or species habitat may occur within area
Hissocampus runa Cavelin Pipefish 166251		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Maroubra perserrata Sawtooth Pipefish 66252		Species or species habitat may occur within area
Mitotichthys meraculus Western Crested Pipefish 66259		Species or species habitat may occur within area
Nannocampus subosseus Bonyhead Pipefish, Bonyheaded Pipefish 66264		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon 66267		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon 66268		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pugnosed Pipefish 66269		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish 66273		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish 66276		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Widebodied Pipefish, Black Pipefish 66277		Species or species habitat may occur within area
Stigmatopora carinirostris Spiry Pipefish 66282		Species or species habitat may occur within area
Stigmatopora margaritifera Mother-of-pearl Pipefish 66283		Species or species habitat may occur within area
Stigmatopora phillipi Port Phillip Pipefish 66284		Species or species habitat may occur within area
Stigmatopora poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Longsnouted Pipefish 66285		Species or species habitat may occur within area
Mammals		
Arctocephalus forsteri Longnosed Fur Seal, New Zealand Fur Seal 20		Species or species habitat may occur within area
Neophoca cinerea Australian Sea Lion, Australian Sea Lion 22	Vulnerable	Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle 1763	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle 1765	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth 1768	Endangered	Breeding likely to occur within area
Natator depressus Flatback Turtle 59257	Vulnerable	Breeding likely to occur

Name	Threatened	Type of Presence
		□ithin area
Whales and other Cetaceans		□Resource Information □
Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata		
Minke Whale □33□		Species or species habitat may occur □ithin area
Balaenoptera edeni		
Bryde's Whale □35□		Species or species habitat may occur □ithin area
Balaenoptera musculus		
Blue Whale □36□	Endangered	Species or species habitat likely to occur □ithin area
Caperea marginata		
Pygmy Right Whale □39□		Species or species habitat may occur □ithin area
Delphinus delphis		
Common Dolphin, Short-beaked Common Dolphin □60□		Species or species habitat may occur □ithin area
Eubalaena australis		
Southern Right Whale □40□	Endangered	Breeding known to occur □ithin area
Grampus griseus		
Risso's Dolphin, Grampus □64□		Species or species habitat may occur □ithin area
Ingenorhynchus obscurus		
Dusky Dolphin □43□		Species or species habitat may occur □ithin area
Megaptera novaeangliae		
Commonback Whale □38□	□ulnerable	Congregation or aggregation known to occur □ithin area
Orcinus orca		
Killer Whale, Orca □46□		Species or species habitat may occur □ithin area
Stenella attenuata		
Spotted Dolphin, Pantropical Spotted Dolphin □51□		Species or species habitat may occur □ithin area
Tursiops aduncus		
Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin □6418□		Species or species habitat likely to occur □ithin area
Tursiops truncatus s. str.		
Bottlenose Dolphin □6417□		Species or species habitat may occur □ithin area

E□ta Information

State and Territory Reserves		□Resource Information □
Name	State	
□eeu□in□Naturaliste	WA	
Regional Forest Agreements		□Resource Information □
Note that all areas □ith completed RFAs have been included.		
Name	State	
South West WA RFA	Western Australia	

Invasive Species

Resource Information

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

Name	Status	Type of Presence
Birds		
Anas platyrhynchos Mallard 1974		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon 1803		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle Dove, Laughing Dove 1781		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling 1389		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle 116		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog 182654		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat 119		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia 185733		Species or species habitat likely to occur within area
Mus musculus House Mouse 1120		Species or species habitat likely to occur within area
Lepus cuniculus Rabbit, European Rabbit 1128		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat 184		Species or species habitat likely to occur within area
Sus scrofa Pig 16		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox 118		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus 122473		Species or species habitat likely to occur within area
Cenchrus ciliaris Buffelgrass, Black Buffelgrass 120213		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed 116905		Species or species habitat likely to occur

Name	Status	Type of Presence
Genista linifolia Fla-leaved Broom, Mediterranean Broom, FlaBroom 2800		ithin area Species or species habitat likely to occur ithin area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom 20126		Species or species habitat likely to occur ithin area
Genista sp. Genista monspessulana Broom 67538		Species or species habitat may occur ithin area
Lycium ferocissimum African Bo-thorn, Bo-thorn 19235		Species or species habitat likely to occur ithin area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine 20780		Species or species habitat may occur ithin area
Rubus fruticosus aggregate Blackberry, European Blackberry 68406		Species or species habitat likely to occur ithin area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar 16018		Species or species habitat likely to occur ithin 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 (MAENT or BIOCOM habitat modelling) using point locations and environmental data layers.

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

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

- migratory and
- marine

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

- threatened species listed as extinct or considered as 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

133.97104 114.99517

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](#)
[Biodiversity 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](#)
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[Australian National Herbarium, Canberra](#)
[University of New England](#)
[Ocean Biogeographic Information System](#)
[Australian Government, Department of Defence](#)
[Forestry Corporation, NSW](#)
[Geoscience Australia](#)
[CSIRO](#)
[Australian Tropical Herbarium, Cairns](#)
[eBird Australia](#)
[Australian Government Australian Antarctic Data Centre](#)
[Museum and Art Gallery of the Northern Territory](#)
[Australian Government National Environmental Science Program](#)
[Australian Institute of Marine Science](#)
[Reef Life Survey Australia](#)
[American Museum of Natural History](#)
[Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
[Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
[Other groups and individuals](#)

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

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

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APPENDIX D

BLACK COCKATOO HABITAT TREE DETAILS

Habitat Trees

DBH >50cm

Datum - GDA94

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

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt005	50H	314908	6239457	Marri	15-20	>50	2+	Small	No Signs	No Signs	No	
wpt010	50H	314881	6239453	Marri	15-20	>50	0					
wpt011	50H	314871	6239423	Marri	15-20	>50	0					

DISCLAIMER

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

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

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

In preparing the report, the Author has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report (“the data”). Except as otherwise stated in the report, the Author has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (“conclusions”) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. The Author will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to the Author.

The report has been prepared for the benefit of the Client and no other party. The Author assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of the Author or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

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