Fauna Assessment

Proposed Telstra Tower Site Jalbarragup Road

Jalbarragup

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Version 1

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Acronyms/Abbreviations:

ALA: Atlas of Living Australia – Website - www.ala.org.au/

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

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

BoM: Bureau of Meteorology, Australian 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.

DAA: Department of Aboriginal Affairs, Western Australia.

DAFWA: Department of Agriculture and Food, Western Australia.

DBH: Diametre at breast height (~1.5m) of a tree.

DEC: Department of Environment and Conservation (now DPaW and DER), 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 DotE), Australian Government

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

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

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

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

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

DoW: Department of Water, Western Australia.

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.

GIS: Geographical Information System.

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.

kms: Kilometres.

MRWA: Main Roads Western Australia, WA Government

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, formerly DEH, DEWHA), Australian Government

SRE: Short Range Endemic.

SSC: Species Survival Commission, International.

WA: Western Australia.

WAM: Western Australian Museum, WA Government.

SUMMARY

This report details the results of a fauna assessment of a proposed Telstra communications tower site located adjacent to the junction of Jalbarragup Road and Longbottom Road, Jalbarragup. The tower site consists of a 90m x 90m area located within remnant native bushland (~0.81 ha). The area assessed has also included a 50m wide corridor following the existing Jalbarragup Road (i.e. 25m either side of the existing road centreline for ~900 m = ~4.59 ha), southwards to Brook Road (Figures 1 & 2).

Information obtained as part of this fauna assessment report will be used in conjunction with other environmental investigations to guide ongoing project planning which will aim to minimise potential environmental impacts.

The scope of works was to conduct a level 1 fauna survey as defined by the EPA (EPA 2004). In accordance with these guidelines the assessment has therefore included a literature review and a field reconnaissance survey. Because some listed threatened species (e.g. several species of black cockatoo) are known to occur in the general area, the scope of the survey work was expanded to include targeted assessment of the site's significance to these species.

Daytime field survey work at the site was carried out by Greg Harewood (B.Sc. - Zoology) on the on the 5 January 2017.

Descriptions of the broadly defined fauna habitats, based primarily on vegetation units and landforms identified during the field reconnaissance survey are provided in Table 1.

Excluding existing cleared areas, the fauna habitats present within the subject site can be regarded as good and the area is likely to be utilised at any one time for some purpose by a substantial proportion of the predicted fauna species. The natural fauna habitats present is typical of the wider area and it is considered unlikely that the subject site contains better quality habitat compared to surrounding areas.

The single natural fauna habitat present (Jarrah Marri Woodland/Open Woodland) appears to be widespread and well represented in the adjoining/nearby state forest and national parks.

The black cockatoo habitat tree assessment 122 trees with a DBH of >50cms within the subject site. The majority (72, ~59%) of the trees were not observed to contain hollows of any size. Forty (40, ~33%) of the trees contained one or more possible hollows considered by the Author not to be suitable for black cockatoos to use for nesting purposes. Ten trees (10, ~8%) were identified as potentially containing hollows that appeared possibly big enough to allow the entry of a black cockatoo into a suitably sized and orientated branch/trunk though no evidence of actual use by black cockatoos (e.g. significant chew marks around hollow entrance) was seen.

It should be noted that only a subset of these trees is likely to require clearing, these being mainly located within the proposed tower compound area (i.e. 34 trees in total).

The number of trees outside this area that may need removal is unknown at this stage, but is only likely to be represented by a few specimens.

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

Foraging debris left by black cockatoos observed within the subject site was relatively sparse. The most commonly recorded evidence was chewed marri fruits, various examples of which were attributed to all three of the black cockatoo species known to frequent the area. Given the dominance of jarrah and marri within the subject site almost all of the area can be regarded as black cockatoo foraging habitat.

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

There are vast areas of similar habitat in state forest/national parks bordering the subject site and it can be reasonably expected that these areas also contain vegetation that represents breeding, foraging and/or roosting habitat potentially suitable for black cockatoos.

Opportunistic fauna observations are listed in Appendix B. A total of 22 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within or very near the subject site during the survey period.

Most of the fauna species recorded were common, widespread bird species and besides black cockatoos, no evidence of any other fauna species of conservation significance utilising the subject site was found during the site reconnaissance survey.

In this instance the potential impacts on fauna will relate primarily to the loss of a small area of habitat due to clearing within the proposed tower site. A small amount of additional clearing may also be required along Jalbarragup Road though the exact extent of clearing required in this area is yet to be exactly defined. The total extent of clearing is however unlikely to be more than about one hectare and will be comprised of about 0.81 hectares at the proposed tower site and small, narrow strips of roadside vegetation spread along various sections of the existing road alignment. Residual impacts are therefore unlikely to be significant.

Based on the anticipated small extent of clearing and the habitats present, likely impacts on species of conservation significance previously recorded in the general area has been assessed, a summary of which is provided in the table below. Additional information on specific fauna species is provided in Appendix E.

Likelihood of Occurrence and Possible Impacts – Fauna Species of Conservation Significance (continues on following page).

Species	Conservation Status		Habitat Present	Likelihood of Occurrence	Possible Impacts/ Significance of Possible Impacts
	WC Act/ Priority	*EPBC Act*			
Unnamed cricket *Pachysaga munggai*	P3	-	No/Marginal	Unlikely to Occur	None Identified/Negligible
Unnamed Beetle *Trichosternus relictus*	P1	-	No/Marginal?	Unlikely to Occur	None Identified/Negligible
Carter's Freshwater Mussel *Westralunio carteri*	S3	-	No	Would Not Occur	None Identified/Negligible
Margaret River *(Hairy)* Marron *Cherax tenuimanus*	S1	CR	No	Would Not Occur	None Identified/Negligible
Margaret River Burrowing Crayfish *Engaewa pseudoreducta*	S1	CR	No	Would Not Occur	None Identified/Negligible
Western Mud Minnow *Galaxiella munda*	S3	-	No	Would Not Occur	None Identified/Negligible
Black-stripe Minnow *Galaxiella nigrostriata*	P3	-	No	Would Not Occur	None Identified/Negligible
Balston's Pygmy Perch *Nannatherina balstoni*	S3	VU	No	Would Not Occur	None Identified/Negligible
Pouched Lamprey *Geotria australis*	P1	-	No	Would Not Occur	None Identified/Negligible
Orange Bellied Frog *Geocrinia vitellina*	S3	VU	No	Would Not Occur	None Identified/Negligible
White Bellied Frog *Geocrinia alba*	S1	CR	No	Would Not Occur	None Identified/Negligible
Nornalup (Walpole) Frog *Geocrinia lutea*	P3	-	No	Would Not Occur	None Identified/Negligible
Short-nosed Snake *Elapognathus minor*	P2	-	No	Unlikely to Occur	None Identified/Negligible
Malleefowl *Leipoa ocellata*	S3	VU	No	Would Not Occur	None Identified/Negligible
Eastern Great Egret *Ardea alba*	S5	Mig	No	Would Not Occur	None Identified/Negligible
Cattle Egret *Ardea ibis*	S5	Mig	No	Would Not Occur	None Identified/Negligible
Osprey *Pandion haliaetus*	S5	Mig, Ma	No	Would Not Occur	None Identified/Negligible

Species	Conservation Status		Habitat Present	Likelihood of Occurrence	Possible Impacts/ Significance of Possible Impacts
	WC Act/ Priority	*EPBC Act*			
White-bellied Sea Eagle *Haliaeetus leucogaster*	-	Ma	No	Would Not Occur	None Identified/Negligible
Peregrine Falcon *Falco peregrinus*	S7	-	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Glossy Ibis *Plegadis falcinellus*	S5	Mig	No	Would Not Occur	None Identified/Negligible
Blue-billed Duck *Oxyura australis*	P4	-	No	Would Not Occur	None Identified/Negligible
Migratory Shorebirds/Wetland/Seabird Species	S5	Mig	No	Would Not Occur	None Identified/Negligible
Carnaby`s Black Cockatoo *Calyptorhynchus latirostris*	S2	EN	Yes	Known to occur	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Baudin`s Black Cockatoo *Calyptorhynchus baudinii*	S2	VU	Yes	Known to occur	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*	S1	VU	Yes	Known to occur	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Masked Owl (SW population) *Tyto n. novaehollandiae*	P3	-	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Fork-tailed Swift *Apus pacificus*	S5	Mig	Yes	Unlikely to Occur	None Identified/Negligible
Rainbow Bee-eater *Merops ornatus*	S5	Mig	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Grey Wagtail *Motacilla cinerea*	S5	Mig	No	Would Not Occur	None Identified/Negligible
Chuditch *Dasyurus geoffroii*	S3	VU	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Southern Brush-tailed Phascogale *Phascogale tapoatafa ssp*	S3	-	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Southern Brown Bandicoot *Isoodon obesulus fusciventer*	P4	-	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Western Ringtail Possum *Pseudocheirus occidentalis*	S2	VU	No/Marginal	Unlikely to Occur	None Identified/Negligible
Quokka *Setonix brachyurus*	S3	VU	No	Would Not Occur	None Identified/Negligible
Woylie *Bettongia penicillata ogibyi*	S1	EN	No/Marginal	Unlikely to Occur	None Identified/Negligible
Western Brush Wallaby *Macropus irma*	P4	-	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Western False Pipistrelle *Falsistrellus mackenziei*	P4	-	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Water Rat *Hydromys chrysogaster*	P4	-	No	Would Not Occur	None Identified/Negligible

See Appendix A for conservation status codes

In summary, impacts on potential fauna species of conservation significance are anticipated to be negligible primarily due to the relatively small area of anticipated clearing required at any one point and the large expanses of adjoining habitats, much of which are contained within state forests and national parks (see Figure 1). While some small, localised residual loss of fauna habitat may occur for some species, local and regional impacts on the status specific fauna species are anticipated to be negligible/non-existent.

Based on available information and the results of the assessment it is the Author's opinion that the proposal will not compromise any of the DER's fauna related clearing principles. It has also been concluded that if the proposed action were to be referred to the DotEE it would not be classified as a "controlled action" and would therefore not need approval under the *EPBC Act* to proceed (with respect to impacts on fauna only - other factors may need to be considered). These conclusions should be reviewed once planning for the proposal is finalised.

1. INTRODUCTION

This report details the results of a fauna assessment of a proposed Telstra communications tower site located adjacent to the junction of Jalbarragup Road and Longbottom Road, Jalbarragup. The tower site consists of a 90m x 90m area located within remnant native bushland (~0.81 ha). The area assessed has also included a 50m wide corridor following the existing Jalbarragup Road (i.e. 25m either side of the existing road centreline for ~900 m = ~4.59 ha), southwards to Brook Road (Figures 1 & 2).

It is understood that clearing of most if not all the Telstra communications tower site would be required for construction of a shelter, mast, guy ropes and anchor blocks. Some clearing along the existing road may also be needed to allow for the transport of infrastructure to the tower site. While the extent of clearing in this area is not defined, it is only likely to require the removal of small areas of vegetation/individual trees from selected points.

Information obtained as part of this fauna assessment report will be used in conjunction with other environmental investigations to guide ongoing project planning which will aim to minimise potential environmental impacts. It is anticipated that the information presented will also be used by regulatory authorities to assess the potential impact of the proposal on fauna and fauna habitats at the site during the project evaluation and approval process.

2. SCOPE OF WORKS

The scope of works was to conduct a level 1 fauna survey as defined by the EPA (EPA 2004). Because some listed threatened species (i.e. several species of black cockatoo) are known to occur in the general area, the scope of the survey work was expanded to include a targeted assessment of the site's significance to these species as well.

The fauna assessment has therefore included:

1. Level 1 Fauna Survey (to EPA standard);
2. Black Cockatoo Habitat Assessment ("habitat trees" = DBH ≥50cm, existing and potential nest hollows, foraging and roosting habitat); and
3. Report summarising results with management/planning recommendations.

This survey report has been prepared for use in the EPA's EIA process (if required) and is considered suitable for this purpose.

The scope of work has been restricted to a general fauna survey (Level 1 assessment) and a targeted black cockatoo habitat survey (Level 2 assessment). It is anticipated that this level of survey will provide sufficient information to allow decisions on potential impacts and management to be made.

It is considered unlikely that additional detailed Level 2 surveys within the subject site would provide information that would alter any decision making processes required to allow an informed assessment of the impact of the proposal to be made.

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

3. METHODS

3.1 POTENTIAL FAUNA INVENTORY - LITERATURE REVIEW

3.1.1 Database Searches

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

- DPaW's NatureMap Database Search (combined data from DPaW, ALA, WAM, BA and consultants reports) (DPaW 2016); and
- Protected Matters Search Tool (DotEE 2016).

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

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

3.1.2 Previous Fauna Surveys in the Area

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

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

- Biologic (2011). Greenbushes Level 1 Fauna Survey. Unpublished report for Talison Lithium Australia Pty Ltd.
- Biota (2009). Milyeannup Wind Farm - Terrestrial Fauna Survey. Unpublished report for Verve Energy.
- 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 (Sunklands Results).
- ENV Australia (2007). Busselton to Margaret River Transmission Line – Biological Assessment. Unpublished report for Western Power.

- ENV Australia (2009). Millstream Dam Level Two Fauna Assessment. Unpublished report for Water Corporation.
- Harewood, G. (2006). Fauna Assessment (Level 1). Bridgetown Regional Water Supply – Pipeline Route. Unpublished report for Water Corporation.
- Harewood, G. (2007). Fauna Assessment (Level 1). Nannup Transfer Main. Unpublished report for Water Corporation.
- Harewood, G. (2009). Fauna Survey (Level 2). Gracetown. Unpublished report for Strategen.
- Harewood, G. (2010). Targeted Fauna Habitat Assessment, South Western Highway Manjimup to Pemberton Turnoff, Manjimup. Unpublished report for MRWA.
- Harewood, G. (2011). Fauna Habitat Assessment. Vasse Highway (68 – 80 SLK). Unpublished report for MRWA.
- Harewood, G. (2015). Fauna Assessment, Wildcat Road Gravel Investigation Area, Shire of Manjimup. Unpublished report for MRWA.
- HGM (1998). Jangardup South Fauna Survey. Unpublished report for Cable Sands (WA) Pty Ltd.
- 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.
- Ninox Wildlife Consulting (1989). Fauna Survey - Beenup Heavy Minerals Mine ERMP. Unpublished report for BHP UTAH.

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

3.1.3 Existing Publications

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

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

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

3.1.4 Fauna of Conservation Significance

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

- *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*). Administered by the Australian Government Department of the Environment and Energy (DotEE);
- *Wildlife Conservation Act 1950* (*WC Act*). Administered by the Western Australian Department of Parks and Wildlife (DPaW) (Govt. of WA 2015);
- 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
- DPaW Priority Fauna list. A non-statutory list maintained by the DPaW for management purposes (DPaW 2015).

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 - Species listed under JAMBA are also protected under Schedule 5 of the *WC Act*.)

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

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

3.1.5 Taxonomy and Nomenclature

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

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

3.1.6 Likelihood of Occurrence – Fauna of Conservation Significance

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

- Would Not Occur: There is no suitable habitat for the species in the subject site and/or there is no documented record of the species in the general area since records have been kept and/or the species is generally accepted as being locally/regionally extinct (supported by a lack of recent records).
    - Locally Extinct: Populations no longer occur within a small part of the species natural range, in this case within 10 or 20km of the study area. Populations do however persist outside of this area.
    - Regionally Extinct: Populations no longer occur in a large part of the species natural range, in this case within the southern forest regions. Populations do however persist outside of this area.
- Unlikely to Occur: The subject site is outside of the currently documented distribution for the species in question, or no suitable habitat (type, quality and extent) was identified as being present during the field assessment. Individuals of some species may occur occasionally as vagrants/transients especially if suitable habitat is located nearby but the subject site itself would not support individuals or a population the species.
- Possibly Occurs: The subject site is within the known distribution of the species in question and habitat of at least marginal quality was identified as being present during the field assessment, supported in some cases by recent records being documented in literature from within or near the subject site. In some cases, while a species may be classified as possibly being present at times, habitat may be

marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.

- Known to Occur: The species in question was positively identified as being present (for sedentary species) or as using the subject site as habitat for some other purpose (for non-sedentary/mobile species) during the field survey. This information may have been obtained by direct observation of individuals or by way of secondary evidence (e.g. foraging debris, tracks and scats). In some cases, while a species may be classified as known to occur, habitat may be marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.

3.2 SITE SURVEYS

A day time field survey at the subject site was carried out by Greg Harewood (B.Sc. - Zoology) on the 5 January 2017.

3.2.1 Fauna Habitat Assessment

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

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 subject site 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.

3.2.2 Black Cockatoo Habitat Assessment

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

- be done by a suitably qualified person with experience in vegetation or cockatoo surveys, depending on the type of survey being undertaken;
- maximise the chance of detecting the species' habitat and/or signs of use;
- determine the context of the site within the broader landscape—for example, the amount and quality of habitat nearby and in the local region (for example, within 10 km);

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

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

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

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

3.2.2.1 Black Cockatoo Breeding Habitat

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

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

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

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

- Small = ~<5cm diametre (i.e. entrance too small for a black cockatoo);
- Medium = ~5cm-10cm diametre (i.e. entrance too small for a black cockatoo);
- Large = ~>10cm diametre (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 diametre (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 place 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 for black cockatoos to use for nesting.

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

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

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

3.2.2.2 Black Cockatoo Foraging Habitat

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

3.2.2.3 Black Cockatoo Roosting Habitat

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

3.2.3 Opportunistic Fauna Observations

Opportunistic observations of fauna species were made during the field survey. Methods involved traversing a series of transects across the subject site during the day while searching microhabitats such as logs, rocks, leaf litter and observations of bird species with

binoculars. Secondary evidence of a species presence such as tracks, scats, skeletal remains, foraging evidence or calls were also noted if observed/heard.

4. SURVEY CONSTRAINTS

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

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

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

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

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

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

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

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

5. RESULTS

5.1 POTENTIAL FAUNA INVENTORY – LITERATURE REVIEW

A list of fauna species considered most likely to occur in the subject site has been compiled from information obtained during the literature review and is presented in Appendix B. This listing was refined after information gathered during the site reconnaissance survey was assessed. The results of some previous fauna surveys carried out in the general area are summarised in this species listing as are the DPaW NatureMap database search results. The raw database search results from NatureMap (DPaW 2016) and the Protected Matters Search Tool (DotEE 2016) are contained within Appendix C.

The list of potential fauna takes into consideration that firstly, the species in question is not known to be locally extinct and secondly, that suitable habitat for each species, as identified during the habitat assessment, is present within the subject site, though compiling an accurate list has limitations (see Section 4 above) and therefore as discussed, the listing is very likely to be an overestimation of the fauna species actually present onsite at any one time.

With respect to native vertebrate fauna, 21 mammal (including nine bat species), 86 bird, 32 reptile and two frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the subject site at times. Eight species of introduced animals could also frequent the area.

Of the 141 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 four DPaW priority species are also listed as potentially present.

5.2 SITE SURVEYS

5.2.1 Fauna Habitat Assessment

Descriptions of the broadly defined fauna habitats, based primarily on vegetation units and landforms identified during the field reconnaissance survey are provided in Table 1 below.

Table 1: Main Fauna Habitats within the Subject site

Unit	Fauna Habitat Description	Example Image
1	**Jarrah & Marri Woodland/Open Woodland** Woodland to very open woodland dominated by jarrah and marri over a variable low open woodland (with bull banksia and woody pear) over a shrubland (with balga bush) on pisolitic laterite.	
2	**Existing Cleared Areas** Existing narrow gravel road and some small gravel extraction areas with variable stages of regrowth.	

Excluding existing cleared areas, the fauna habitats present within the subject site can be regarded as being in good condition despite evidence of historical logging, gravel extraction and fire. It can be expected that the area is likely to be utilised at any one time for some purpose by a substantial proportion of the predicted fauna species. The natural fauna habitats present is typical of the wider area and it is considered unlikely that the subject site contains better quality habitat compared to surrounding areas.

The single natural fauna habitat present (Jarrah Marri Woodland/Open Woodland) appears to be widespread and well represented in the adjoining/nearby state forest and national parks. The subject site is totally surrounded by vast areas of continuous native remnant vegetation and therefore it does not specifically represent a “linkage” or “corridor” for wildlife movement. The small amount of clearing likely to be required for proposed works will not create any barriers to fauna movement on a local or regional scale.

5.2.2 Black Cockatoo Habitat Assessment

5.2.2.1 Black Cockatoo Habitat Tree Assessment

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

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

A summary of the potential black cockatoo breeding trees (using DotEE criteria i.e. any suitable tree species with a DBH ≥ 50cm (SEWPaC 2012)) observed within the subject site is provided in Table 2 below and their location shown in Figure 3.

Table 2: Summary of potential cockatoo breeding habitat trees (DBH ≥50cm)

Site	Total Number of Habitat Trees	Number of Trees with No Hollows Observed	Number of Trees with Hollows Considered Unsuitable for Nesting Black Cockatoos	Number of Trees with Hollows Considered Possibly Suitable for Nesting Black Cockatoos	Tree Species		
					Marri	Jarrah	Dead Unknown
Tower Compound	34	15	17	2	12	22	0
East Road Verge	49	27	17	5	9	37	3
West Road Verge	39	30	6	3	10	29	0
Total	122	72	40	10	31	88	3

The assessment identified a total of 122 trees with a DBH of ≥50cms within the subject site. The majority (72, ~59%) of the trees were not observed to contain hollows of any size. Forty (40, ~33%) of the trees contained one or more possible hollows considered by the Author not to be suitable for black cockatoos to use for nesting purposes. Ten trees (10, ~8%) were identified as potentially containing hollows that appeared possibly big enough to allow the entry of a black cockatoo into a suitably sized and orientated branch/trunk though no evidence of actual use by black cockatoos (e.g. significant chew marks around hollow entrance) was seen.

It should be noted that only a subset of these trees is likely to require clearing, these being mainly located within the proposed tower compound area (i.e. 34 trees in total). The number of trees outside this area that may need removal is unknown at this stage, but is only likely to be represented by a few specimens.

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

There are also vast areas of similar habitat in state forest/national parks in the area and it can be reasonably expected that these also contain numerous “habitat trees” many of which are likely to provide breeding opportunities for black cockatoos.

5.2.2.2 Black Cockatoo Foraging Habitat Assessment

Following is a list of the main flora species recorded within the subject site during the fauna assessment that are known to be used as a direct food source (i.e. seeds or flowers) by one or more species of black cockatoo:

- Marri - *Corymbia calophylla*;
- Jarrah - *Eucalyptus marginata*;
- Bull Banksia – *Banksia grandis;* and
- Balga – *Xanthorrhoea preissii.*

It should be noted that some of the above-mentioned species (e.g. balga) while foraged upon on occasions are only likely to make up a small proportion of any one birds diet relative to more favoured plant species such as marri.

Foraging debris left by black cockatoos observed within the subject site was relatively sparse. The most commonly recorded evidence was chewed marri fruits, various examples of which were attributed to all three of the black cockatoo species known to frequent the area.

Given the dominance of jarrah and marri within the subject site almost all of the area can be regarded as black cockatoo foraging habitat. There are also vast areas of similar habitat in state forest/national parks in the vicinity and it can be reasonably expected that these areas also contain vegetation that represents foraging habitat suitable for black cockatoos.

5.2.2.3 Black Cockatoo Roosting Habitat Assessment

No evidence of black cockatoo roosting within trees located within the subject site was observed during the field reconnaissance survey.

There are vast areas of similar habitat in forests bordering or near the subject site and it can be reasonably expected that these areas contain many roosting options for black cockatoos.

5.2.3 Other Fauna Species of Conservation Significance

Beside the foraging debris left by black cockatoos, no evidence of any other fauna species of conservation significance utilising the subject site was found during the site reconnaissance survey.

The habitat assessment and other observations made during the field reconnaissance survey does however suggest that some fauna species of conservation significance are likely to persist in the general area. Subject to suitable habitat being present (i.e. quality and extent) it is considered possible that some are also likely to reside or at least frequent the subject site at times. The subject site is however very small and therefore any fauna species actually present are only likely to be represented by a small number of individuals at any one time. A summary of those species considered likely to be present is provided in Table 4 within Section 7. Additional information on this assessment of likelihood of occurrence being provided in Appendix E.

5.2.4 Opportunistic Fauna Observations

Opportunistic fauna observations are listed in Appendix B. A total of 22 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within or very near the subject site during the survey period.

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

5.3 FAUNA INVENTORY – SUMMARY

Table 3 summarises the number of fauna species potentially occurring within or utilising at times the subject site, based on results from the literature review and observations made during the field assessment. A complete list of fauna possibly inhabiting or frequenting the subject site is located in Appendix B (Note: only a subset of the potential invertebrate species are listed).

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

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

Group	Total number of potential species	Potential number of specially protected species	Potential number of migratory species	Potential number of priority species	Number of species observed: L1 Field Survey 2017
Amphibians	2	0	0	0	0
Reptiles	32	0	0	0	1
Birds	87[1]	4	1	1	19
Non-Volant Mammals	19[7]	2	0	2	2
Volant Mammals (Bats)	9	0	0	1	0
Total	**149[8]**	**6**	**1**	**4**	**22**

Superscript = number of introduced species included in total.

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 site (either on a regular or infrequent basis) as a result of the precautionary approach adopted for the assessment. At any one time only a subset of the listed potential species are likely to be present within the bounds of the subject site.

A number of other species of conservation significance, while possibly present in the general 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. LIKELIHOOD OF OCCURRENCE AND POTENTIAL IMPACTS

Fauna of conservation significance identified during the literature review as previously being recorded in the general area are listed in Table 4. Each has been assessed and ranked for their likelihood of occurrence within the subject site itself based on information obtained during the fauna assessment.

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.

In this instance the potential impacts on fauna will relate primarily to the loss of a small area of habitat due to clearing within the proposed tower site. A small amount of additional clearing may also be required along Jalbarragup Road though the exact extent of clearing required in this area is yet to be exactly defined. The total extent of clearing is however unlikely to be more than about one hectare and will be comprised of about 0.81 hectares at the proposed tower site and small, narrow strips of roadside vegetation spread along various sections of the existing road alignment. Residual impacts are therefore unlikely to be significant.

Based on the anticipated small extent of clearing and the habitats present, likely impacts on species of conservation significance previously recorded in the general area has been assessed, a summary of which is provided in Table 4 below. Additional information on specific fauna species is provided in Appendix E.

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

Species	Conservation Status		Habitat Present	Likelihood of Occurrence	Possible Impacts/ Significance of Possible Impacts
	WC Act/ Priority	*EPBC Act*			
Unnamed cricket *Pachysaga munggai*	P3	-	No/Marginal	Unlikely to Occur	None Identified/Negligible
Unnamed Beetle *Trichosternus relictus*	P1	-	No/Marginal?	Unlikely to Occur	None Identified/Negligible
Carter's Freshwater Mussel *Westralunio carteri*	S3	-	No	Would Not Occur	None Identified/Negligible
Margaret River *(Hairy) Marron Cherax tenuimanus*	S1	CR	No	Would Not Occur	None Identified/Negligible
Margaret River Burrowing Crayfish *Engaewa pseudoreducta*	S1	CR	No	Would Not Occur	None Identified/Negligible
Western Mud Minnow *Galaxiella munda*	S3	-	No	Would Not Occur	None Identified/Negligible
Black-stripe Minnow *Galaxiella nigrostriata*	P3	-	No	Would Not Occur	None Identified/Negligible
Balston's Pygmy Perch *Nannatherina balstoni*	S3	VU	No	Would Not Occur	None Identified/Negligible
Pouched Lamprey *Geotria australis*	P1	-	No	Would Not Occur	None Identified/Negligible
Orange Bellied Frog *Geocrinia vitellina*	S3	VU	No	Would Not Occur	None Identified/Negligible
White Bellied Frog *Geocrinia alba*	S1	CR	No	Would Not Occur	None Identified/Negligible
Nornalup (Walpole) Frog *Geocrinia lutea*	P3	-	No	Would Not Occur	None Identified/Negligible
Short-nosed Snake *Elapognathus minor*	P2	-	No	Unlikely to Occur	None Identified/Negligible
Malleefowl *Leipoa ocellata*	S3	VU	No	Would Not Occur	None Identified/Negligible
Eastern Great Egret *Ardea alba*	S5	Mig	No	Would Not Occur	None Identified/Negligible
Cattle Egret *Ardea ibis*	S5	Mig	No	Would Not Occur	None Identified/Negligible

Species	Conservation Status		Habitat Present	Likelihood of Occurrence	Possible Impacts/ Significance of Possible Impacts
	WC Act/ Priority	*EPBC Act*			
Osprey *Pandion haliaetus*	S5	Mig, Ma	No	Would Not Occur	None Identified/Negligible
White-bellied Sea Eagle *Haliaeetus leucogaster*	-	Ma	No	Would Not Occur	None Identified/Negligible
Peregrine Falcon *Falco peregrinus*	S7	-	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Glossy Ibis *Plegadis falcinellus*	S5	Mig	No	Would Not Occur	None Identified/Negligible
Blue-billed Duck *Oxyura australis*	P4	-	No	Would Not Occur	None Identified/Negligible
Migratory Shorebirds/Wetland/Seabird Species	S5	Mig	No	Would Not Occur	None Identified/Negligible
Carnaby`s Black Cockatoo *Calyptorhynchus latirostris*	S2	EN	Yes	Known to occur	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Baudin`s Black Cockatoo *Calyptorhynchus baudinii*	S2	VU	Yes	Known to occur	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*	S1	VU	Yes	Known to occur	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Masked Owl (SW population) *Tyto n. novaehollandiae*	P3	-	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Fork-tailed Swift *Apus pacificus*	S5	Mig	Yes	Unlikely to Occur	None Identified/Negligible
Rainbow Bee-eater *Merops ornatus*	S5	Mig	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Grey Wagtail *Motacilla cinerea*	S5	Mig	No	Would Not Occur	None Identified/Negligible
Chuditch *Dasyurus geoffroii*	S3	VU	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Southern Brush-tailed Phascogale *Phascogale tapoatafa ssp*	S3	-	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Southern Brown Bandicoot *Isoodon obesulus fusciventer*	P4	-	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Western Ringtail Possum *Pseudocheirus occidentalis*	S2	VU	No/Marginal	Unlikely to Occur	None Identified/Negligible
Quokka *Setonix brachyurus*	S3	VU	No	Would Not Occur	None Identified/Negligible
Woylie *Bettongia penicillata ogibyi*	S1	EN	No/Marginal	Unlikely to Occur	None Identified/Negligible
Western Brush Wallaby *Macropus irma*	P4	-	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible

Species	Conservation Status		Habitat Present	Likelihood of Occurrence	Possible Impacts/ Significance of Possible Impacts
	WC Act/ Priority	*EPBC Act*			
Western False Pipistrelle *Falsistrellus mackenziei*	P4	-	Yes	Possibly Occurs	Potential for localised, modification/loss of small areas of possible habitat/Negligible
Water Rat *Hydromys chrysogaster*	P4	-	No	Would Not Occur	None Identified/Negligible

See Appendix A for conservation status codes

In summary, impacts on potential fauna species of conservation significance are anticipated to be negligible primarily due to the relatively small area of anticipated clearing required at any one point and the large expanses of adjoining habitats, much of which are contained within state forests and national parks (see Figure 1). While some small, localised residual loss of fauna habitat may occur for some species, local and regional impacts on the status specific fauna species are anticipated to be negligible/non-existent.

7. LEGISLATIVE OBLIGATIONS

7.1 ENVIRONMENTAL PROTECTION ACT 1986

The purpose of the *Environmental Protection Act (1986)* is "*...to provide for an Environmental Protection Authority, for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection enhancement and management of the environment and for matters incidental to or connected with the foregoing*".

The powers of the Environmental Protection Act 1986 are administered by the Department of Environment Regulation (DER), which in relevant cases advises to the Environmental Protection Authority (EPA).

Legislation proclaimed on 8 July 2004 protects all native vegetation in Western Australia. Under the law, clearing native vegetation is prohibited, unless a clearing permit is granted by the DER, or the clearing is for an exempt purpose. These exemptions ensure that low impact day to day activities involving clearing can be undertaken. People that wish to clear are required to submit an application if an exemption does not apply.

Clearing applications are assessed against ten defined clearing principles related to native vegetation in the *EP Act*. These principles provide a guide for when native vegetation should not be cleared. The DER must consider these principles in making a decision on whether or not to issue a clearing permit. The DER has set out the minimum requirements and standards for addressing each of the ten principles in detail in its assessment methodology.

Any proposed clearing should not be in variance to any of the 10 clearing principles, these being:

Native vegetation should not be cleared if

(a) it comprises a high level of biological diversity;

(b) it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia;

(c) it includes, or is necessary for the continued existence of, rare flora;

(d) it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community;

(e) it is significant as a remnant of native vegetation in an area that has been extensively cleared;

(f) it is growing in, or in association with, an environment associated with a watercourse or wetland;

(g) the clearing of the vegetation is likely to cause appreciable land degradation;

(h) the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area;

(i) the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water; or

(j) clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

One purpose of the assessment reported on here is to provide information relevant to principle (a) & (b). Based on the assessment results and despite the fact that the area is or is possibly being utilised by some species of conservation significance it is the Author's opinion that the site doesn't have what would be considered a high level of biological diversity or constitute the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

This opinion is based on the fact that fauna habitats present within the subject site are common and widespread in the general area, the total extent of clearing is likely to be very small and the fauna assemblage identified as potentially present is unlikely to be different to that found in similar habitats located elsewhere in the region. It can therefore be concluded that the subject site does not contain habitats of high ecological significance from a fauna perspective or contain faunal assemblages that are ecologically significant. The vegetation types proposed to be cleared are well represented within the local area including several national parks, and therefore it is unlikely the any areas to be cleared will be considered to be locally or regionally significant remnants.

The DER will however consider all available information relating to all 10 clearing principles, not just those relating to fauna. The possible use of the subject site by several species of conservation significance will influence the DER decision making process, though it is difficult to predict specific outcomes as some discretion is exercised by the DER when assessing the appropriateness of any clearing activities. Any proposed rehabilitation, offsets, mitigation measures and management plans are also taken into consideration.

7.2 ENVIRONMENT PROTECTION & BIODIVERSITY CONSERVATION ACT 1999

A number of fauna species known to occur or potentially present within the subject site are listed under the federal *EPBC Act* as threatened species. The objective of the *EPBC Act* is to provide for the protection of the environment, especially those aspects that are of national significance, promote ecologically sustainable development, the conservation of

biodiversity and a cooperative approach to the protection and management of the environment.

If an action (i.e. clearing of native vegetation) is deemed to have a potential "significant impact" on any listed species (or their habitat), a referral to the DotEE is required to ensure compliance with the *EPBC Act*. Actions that are assessed as likely to have a "significant impact" are deemed "controlled actions" and if approved are typically subject to conditions imposed to minimise or offset impacts.

The potential significance of each action is judged on a case-by-case basis by the DotEE and while the various published referral guidelines provide information to assist in deciding whether to refer a proposed "action", the possible impacts will depend on the particular circumstances of the action including (but not limited to) the overall suitability of the habitat, its connectivity, and the amount of habitat remaining in the region.

Given the extent of vegetation requiring clearing for the proposal in question is in total likely to be very small, the apparent absence of any existing cockatoo breeding or roosting trees and the relatively large expanses of native vegetation in adjoining areas it is the Author's opinion that if the proposed action were to be referred to the DotEE it would not be classified as a "controlled action" and would therefore not need approval under the *EPBC Act* to proceed.

This conclusion (based on currently available information) suggests that the proposal would not need to be referred to the DotEE to ensure compliance with the *EPBC Act* (with respect to fauna only – other factors may need to be considered).

8. CONCLUSION

The fauna assessment within the subject site was undertaken for the purposes of delineating and characterising the fauna habitats and faunal assemblages present and to identify potential impacts of the proposed works. A targeted black cockatoo assessment was also carried out.

With respect to native vertebrate fauna, 21 mammal (including nine bat species), 86 bird, 32 reptile and two frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the study area at times. Eight species of introduced animals could also frequent the area.

Of the 141 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 four DPaW priority species are also listed as potentially present.

Overall, many of the conservation significant species previously recorded in the region are unlikely to be impacted on by the proposal since the subject site does not contain their preferred habitat and therefore they are unlikely to be present. In the case of fauna species considered likely to be present, impacts are anticipated to be low primarily due to the small area of clearing required and the large expanses of similar, adjoining habitat, much of which is contained within state forests or national parks. While some small, localised residual loss of fauna habitat may occur for some species, regional impacts on the status of specific fauna species have been assessed as being negligible/non-existent.

Based on available information and the results of the assessment it is the Author's opinion that the proposal will not compromise any of the DER's fauna related clearing principles. It has also been concluded that if the proposed action were to be referred to the DotEE it would not be classified as a "controlled action" and would therefore not need approval under the *EPBC Act* to proceed (with respect to impacts on fauna only - other factors may need to be considered). These conclusions should be reviewed once planning for the proposal is finalised.

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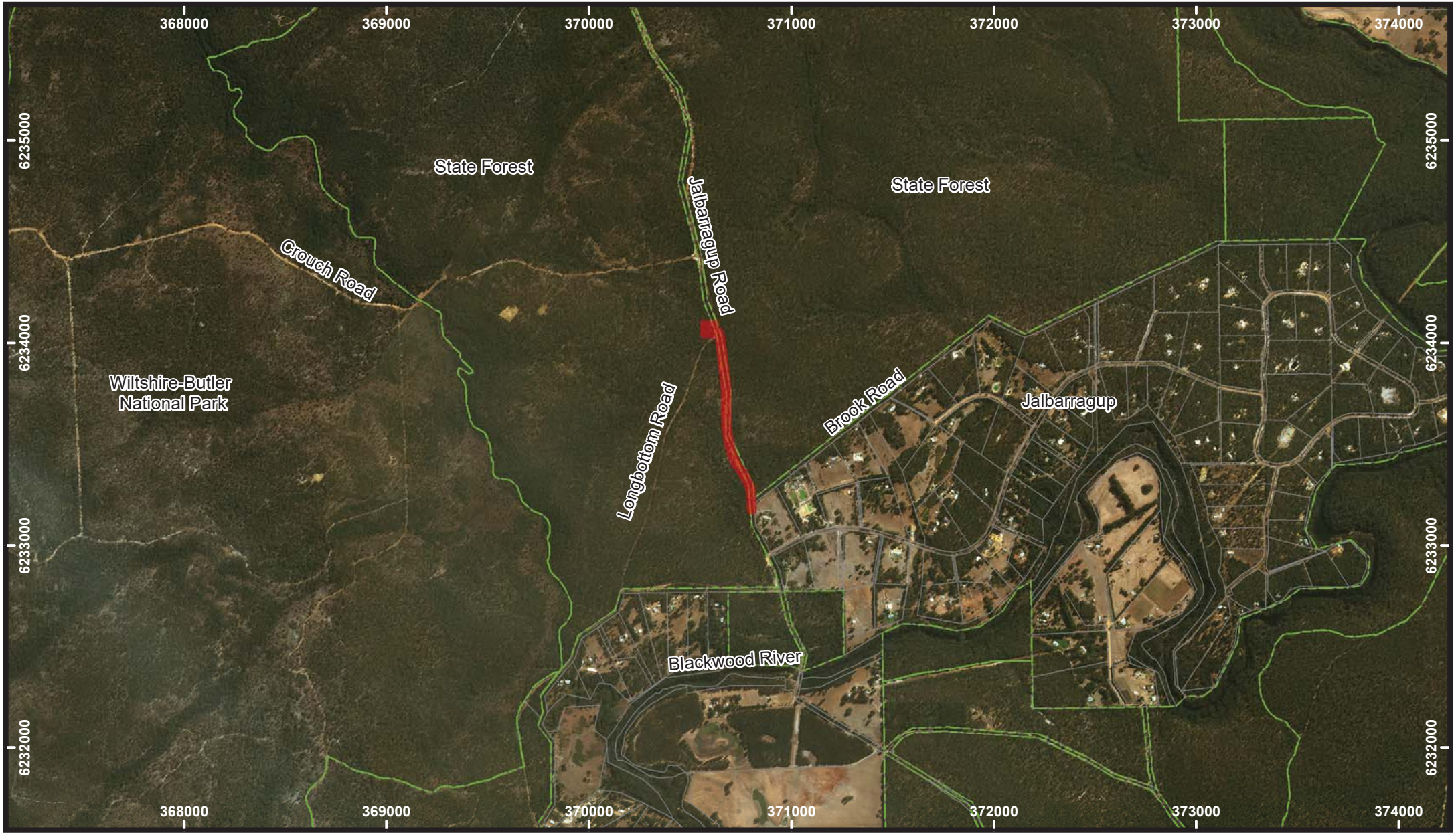
FIGURES



Legend

- Subject Site
- Cadastral Boundaries
- State Forest/National Park Boundary

0 1 2

Kilometres

Fauna Survey

Drawn: G. Harewood

Date: Jan 2017

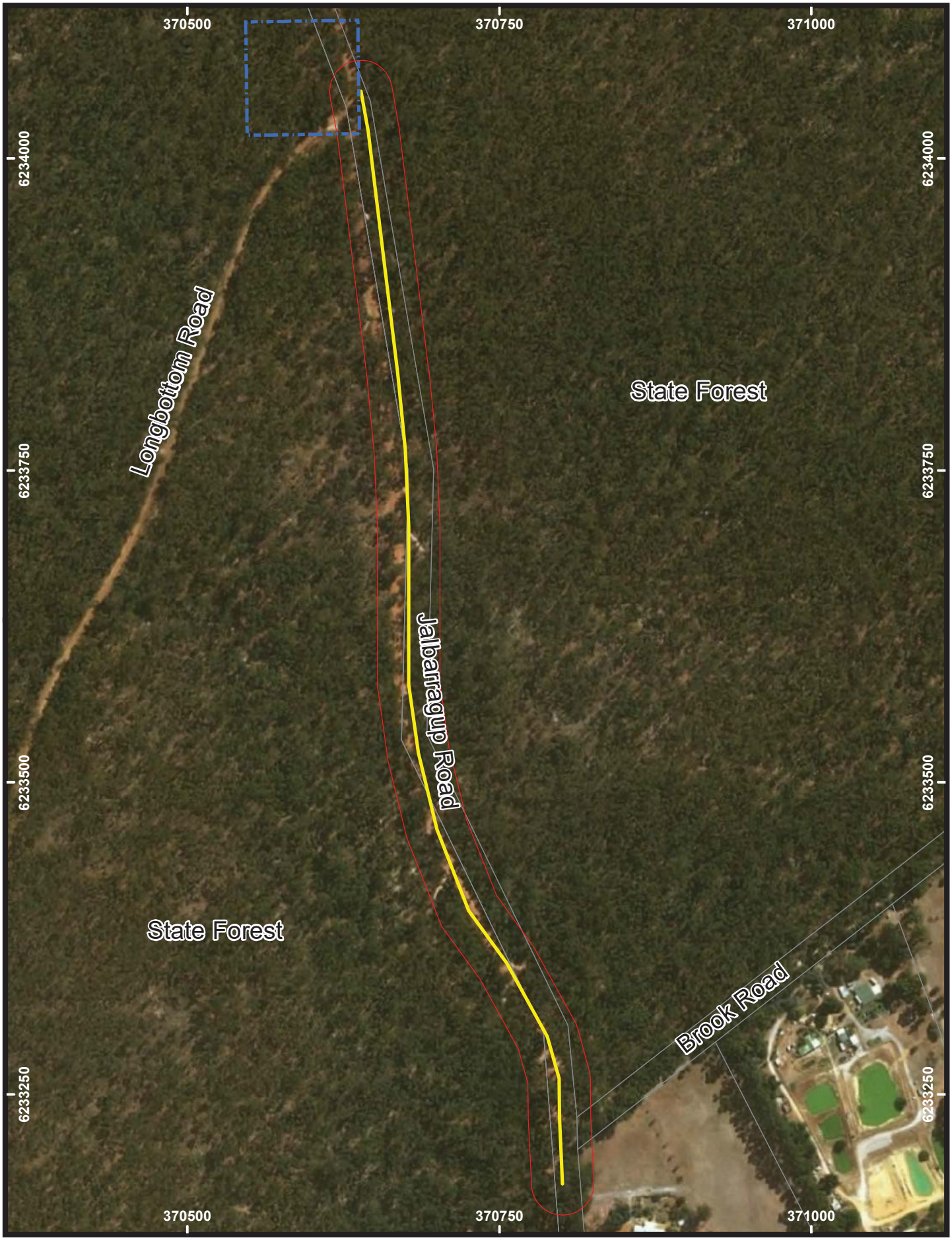
Scale: 1:25,000

Projection/Coordinate System: UTM/MGA Zone 50

Jalbarragup Road
Jalbarragup

Subject Site and Surrounds

Figure: 1



Legend

- Cadastral Boundaries
- Proposed Telstra Tower Site
- Road Alignment
- Road Alignment 25 m buffer

N

0 50 100

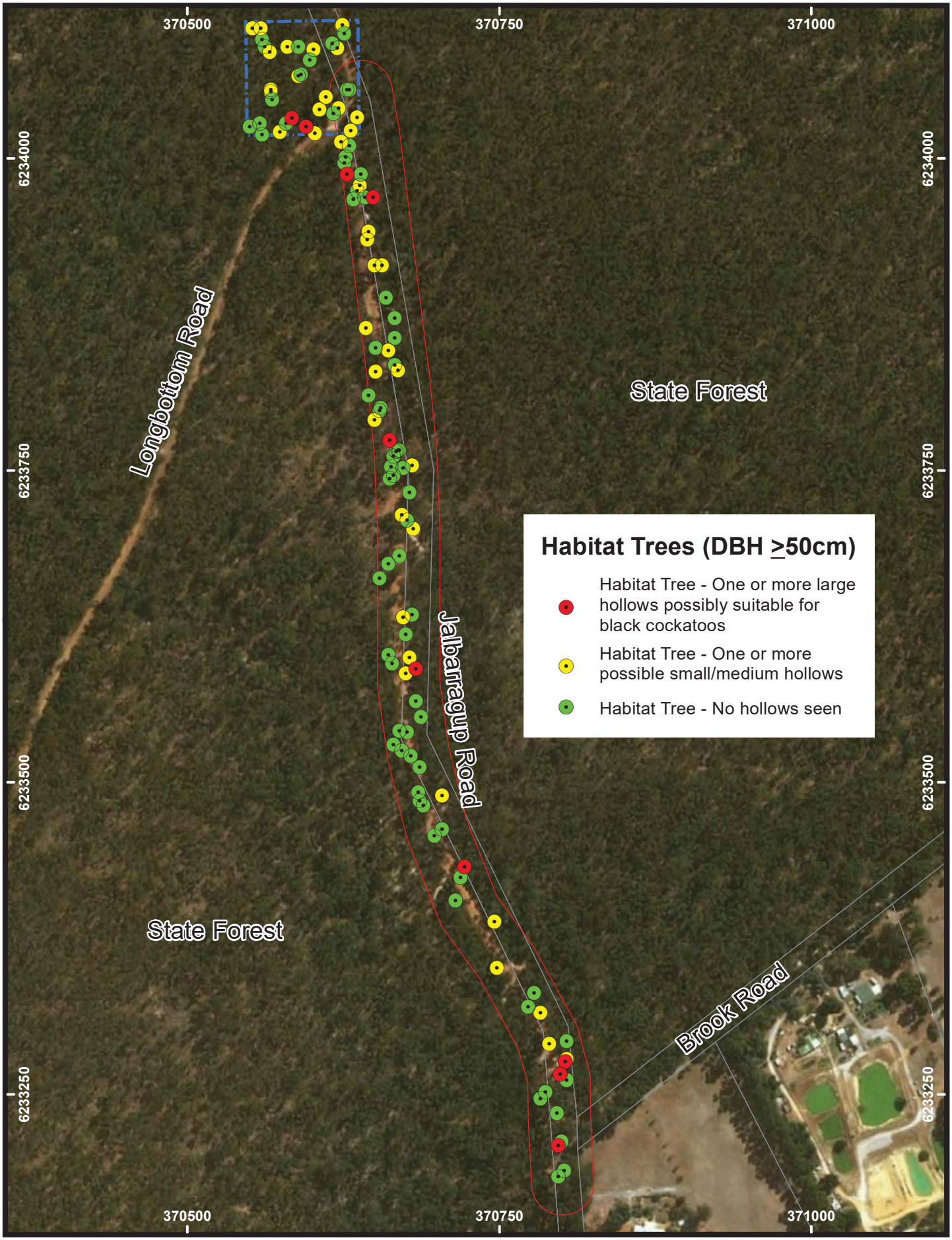
Metres

Fauna Survey

Jalbarragup Road
Jalbarragup

Air Photo Subject Site

Drawn: G. Harewood	
Date: Jan 2017	
Scale: 1:4,000	
Projection/Coordinate System: UTM/MGA Zone 50	Figure: 2



Legend

- Cadastral Boundaries
- Proposed Telstra Tower Site
- Road Alignment + 25 m buffer

N

0 50 100

Metres

Fauna Survey

Drawn: G. Harewood

Date: Jan 2017

Scale: 1:4,000

Projection/Coordinate System: UTM/MGA Zone 50

Figure: 3

Jalbarragup Road
Jalbarragup

Habitat Trees (DBH >50cm)

APPENDIX A

CONSERVATION CATEGORIES

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

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

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

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

Wildlife Conservation (Specially Protected Fauna) Notice 2015 Categories

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

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

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

Western Australian DPaW Priority Fauna Categories

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

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

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

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

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

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

The *IUCN Red List of Threatened Species*™ 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

FAUNA OBSERVED OR POTENTIALLY IN SUBJECT SITE

Fauna Observed or Potentially Present in Subject Site

Proposed Telstra Tower Site - Jalbarragup Road, Jalbarragup, W.A.

Compiled by Greg Harewood - January 2017
Recorded (Trapped/Sighted/Heard/Signs) = X
Approximate centroid = 34.02609°S 115.5983°E

Harewood, G. (2017). Fauna Assessment - Proposed Telstra Tower Site - Jalbarragup Road, Jalbarragup. Unpublished report for Greencap.

ENV Australia (2009). Millstream Dam Level 2 Fauna Assessment. Unpublished report for Water Corportation.

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

Biota (2009). Milyeannup Wind Farm - Terrestrial Fauna Survey. Unpublished report for Verve Energy.

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

HGM (1998). Jangardup South Fauna Survey. Unpublished report for Cable Sands (WA) Pty Ltd.

Ninox Wildlife Consulting (1989). Fauna Survey - Beenup Heavy Minerals Mine ERMP. Unpublished report for BHP UTAH.

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.

DPaW (2016). NatureMap Database search. “By Circle” 115° 35' 54" E, 34° 01' 34" S – Study area (plus 40 km buffer). 15 December 2016.

Class **Family** *Species*	Common Name	Conservation Status	Harewood ('17) Jalbarragup	ENV ('09) Millstrean Dam	Harewood ('09) Gracetown	Biota ('09) Millyeannup	ENV ('07) Busselton to Margaret River	HGM ('94) Jangardup South	Ninox ('89) Beenup	Christensen ('85) Sunklands	DPaW ('16) Nature Map
Amphibians											
Myobatrachidae Ground or Burrowing Frogs											
Heleioporus eyrei	Moaning Frog	LC				X	X	X		X	X
Pseudophryne guentheri	Güenther`s Toadlet	LC		X				X	X		X
Reptiles											
Gekkonidae Geckoes											
Christinus marmoratus	Marbled Gecko				X	X	X	X	X	X	X

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DPaW 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 http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria for others.

Class **Family** *Species*	Common Name	Conservation Status	Harewood ('17) Jalbarragup	ENV ('09) Millstrean Dam	Harewood ('09) Gracetown	Biota ('09) Millyeannup	ENV ('07) Busselton to Margaret River	HGM ('94) Jangardup South	Ninox ('89) Beenup	Christensen ('85) Sunklands	DPaW ('16) Nature Map
Pygopodidae Legless Lizards											
Aprasia pulchella	Pretty Worm Lizard										X
Delma australis	Marbel-faced Delma										X
Lialis burtonis	Common Snake Lizard										
Pygopus lepidopodus	Southern Scaleyfoot				X				X		
Agamidae Dragon Lizards											
Pogona minor	Western Bearded Dragon				X						
Varanidae Monitor's or Goanna's											
Varanus rosenbergi	Heath Monitor				X	X	X	X			X

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DPaW 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 http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria for others.

Class **Family** *Species*	Common Name	Conservation Status	Harewood ('17) Jalbarragup	ENV ('09) Millstrean Dam	Harewood ('09) Gracetown	Biota ('09) Millyeannup	ENV ('07) Busselton to Margaret River	HGM ('94) Jangardup South	Ninox ('89) Beenup	Christensen ('85) Sunklands	DPaW ('16) Nature Map
Scincidae Skinks											
Acritoscincus trilineatum	South-western Cool Skink				X	X	X	X	X	X	
Cryptoblepharus buchananii	Fence Skink									X	X
Ctenotus catenifer	Chain-striped Heath Ctenotus							X	X		X
Ctenotus impar	South-western Odd-striped Ctenotus										X
Ctenotus labillardieri	Red-legged Skink					X	X	X	X	X	X
Egernia kingii	King's Skink						X	X		X	X
Egernia napoleonis	Salmon-bellied Skink		X		X	X	X	X	X		X
Hemiergis gracilipes	Southwestern Mulch Skink							X			X
Hemiergis peronii peronii	Four-toed Mulch Skink			X					X		
Hemiergis peronii tridactyla	Three-toed Mulch Skink				X	X	X	X		X	
Lerista elegans	West Coast Four-toed Lerista				X	X					X
Lerista microtis microtis	Southwestern Five-toed Lerista					X	X	X	X		
Menetia greyii	Dwarf Skink				X					X	X
Morethia lineoocellata	Western Pale-flecked Morethia				X	X	X			X	X
Morethia obscura	Dusky Morethia					X		X		X	X

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DPaW 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 http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria for others.

Class **Family** *Species*	Common Name	Conservation Status	Harewood ('17) Jalbarragup	ENV ('09) Millstrean Dam	Harewood ('09) Gracetown	Biota ('09) Millyeannup	ENV ('07) Busselton to Margaret River	HGM ('94) Jangardup South	Ninox ('89) Beenup	Christensen ('85) Sunklands	DPaW ('16) Nature Map
Tiliqua rugosa rugosa	Western Bobtail			X	X	X	X	X	X	X	
Typhlopidae Blind Snakes											
Anilios australis	Southern Blind Snake					X	X	X	X		
Boidae Pythons, Boas											
Morelia spilota imbricata	Southern Carpet Python				X						
Elapidae Elapid Snakes											
Echiopsis curta	Bardick					X					
Elapognathus coronatus	Crowned Snake				X	X		X	X		X
Notechis scutatus	Tiger Snake					X		X	X	X	X
Parasuta gouldii	Gould's Hooded Snake										
Parasuta nigriceps	Black-backed Snake										X
Pseudonaja affinis	Dugite				X	X	X		X	X	X
Rhinoplocephalus bicolor	Square-nosed Snake							X	X		X

Birds

Casuariidae Emus, Cassowarries											
Dromaius novaehollandiae	Emu	Bp LC		X		X	X	X	X	X	X

WC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DPaW 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 http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria for others.

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Phasianidae Quails, Pheasants											
Coturnix pectoralis	Stubble Quail	LC						X			X
Coturnix ypsilophora	Brown Quail	LC						X	X		
Accipitridae Kites, Goshawks, Eagles, Harriers											
Accipiter cirrocephalus	Collared Sparrowhawk	Bp LC									X
Accipiter fasciatus	Brown Goshawk	Bp LC								X	X
Aquila audax	Wedge-tailed Eagle	Bp LC		X				X	X	X	X
Aquila morphnoides	Little Eagle	Bp LC			X					X	X
Elanus caeruleus	Black-shouldered Kite	LC					X				
Haliastur sphenurus	Whistling Kite	Bp LC								X	X
Hamirostra isura	Square-tailed Kite	Bp LC			X						
Falconidae Falcons											
Falco berigora	Brown Falcon	Bp LC						X	X	X	X
Falco cenchroides	Australian Kestrel	LC				X	X	X	X		X
Falco longipennis	Australian Hobby	LC				X	X		X		X
Falco peregrinus	Peregrine Falcon	S7 Bp LC							X		X

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Turnicidae Button-quails											
Turnix varia	Painted Button-quail	Bp LC			X						
Columbidae Pigeons, Doves											
Phaps chalcoptera	Common Bronzewing	Bh LC		X	X	X			X	X	X
Phaps elegans	Brush Bronzewing	Bh LC			X			X			X
Cacatuidae Cockatoos, Corellas											
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo	S3 VU Bp VU LC	X	X			X	X	X	X	X
Calyptorhynchus baudinii	Baudin`s Black-Cockatoo	S2 EN Bp VU A3cde	X	X	X	X	X	X	X	X	X
Calyptorhynchus latirostris	Carnaby`s Black-Cockatoo	S2 EN Bp EN A2bcde	X	X		X					X
Eolophus roseicapilla	Galah	LC					X				

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

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Tytonidae Barn Owls											
Tyto alba	Barn Owl	LC									X
Tyto n. novaehollandiae	Masked Owl (SW pop.)	P3 Bp									
Podargidae Frogmouths											
Podargus strigoides	Tawny Frogmouth	LC						X	X	X	X
Caprimulgidae Nightjars											
Eurostopodus argus	Spotted Nightjar	LC									
Aegothelidae Owlet-nightjars											
Aegotheles cristatus	Australian Owlet-nightjar	LC							X	X	X
Halcyonidae Tree Kingfishers											
Dacelo novaeguineae	Laughing Kookaburra	Introduced		X	X	X	X	X	X	X	X
Todiramphus sanctus	Sacred Kingfisher	LC						X	X	X	X
Meropidae Bee-eaters											
Merops ornatus	Rainbow Bee-eater	S5 Mig JA LC			X	X	X			X	X

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Climacteridae Treecreepers											
Climacteris rufa	Rufous Treecreeper	Bh		X							X
Maluridae Fairy Wrens, GrassWrens											
Malurus elegans	Red-winged Fairy-wren	Be LC	X	X		X	X	X	X	X	X
Malurus splendens	Splendid Fairy-wren	Bh LC	X	X	X	X	X	X	X	X	X
Pardalotidae Pardalotes, Bristlebirds, Scrubwrens, Gerygones, Thornbills											
Acanthiza apicalis	Broad-tailed Thornbill	Bh LC	X	X	X	X	X	X	X	X	X
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Bh LC				X	X	X	X	X	X
Acanthiza inornata	Western Thornbill	Bh LC		X				X	X	X	X
Gerygone fusca	Western Gerygone	LC	X	X	X	X	X	X	X	X	X
Pardalotus punctatus	Spotted Pardalote	LC				X			X	X	X
Pardalotus striatus	Striated Pardalote	LC	X			X	X	X	X	X	X
Sericornis frontalis	White-browed Scrubwren	Bh LC		X	X	X	X	X	X	X	X
Smicrornis brevirostris	Weebill	Bh LC	X				X			X	X

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Meliphagidae Honeyeaters, Chats											
Acanthorhynchus superciliosus	Western Spinebill	LC		X				X	X		X
Anthochaera carunculata	Red Wattlebird	LC	X		X	X	X	X	X	X	X
Anthochaera lunulata	Western Little Wattlebird	Bp				X		X	X		X
Lichenostomus virescens	Singing Honeyeater	LC				X		X			
Lichmera indistincta	Brown Honeyeater	LC							X		X
Melithreptus brevirostris	Brown-headed Honeyeater	LC									X
Melithreptus chloropsis	Gilberts Honeyeater	LC	X	X				X	X	X	X
Phylidonyris melanops	Tawny-crowned Honeyeater	Bp LC						X	X		
Phylidonyris nigra	White-cheeked Honeyeater	Bp LC							X		
Phylidonyris novaehollandiae	New Holland Honeyeater	Bp LC		X	X	X		X	X	X	X
Petroicidae Australian Robins											
Eopsaltria australis	Western Yellow Robin	Bh LC				X	X			X	X
Eopsaltria georgiana	White-breasted Robin	Bh LC	X	X	X	X	X	X	X	X	X
Petroica multicolor	Scarlet Robin	Bh LC		X		X	X	X	X	X	X

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Pomatostomidae Babblers											
Pomatostomus superciliosus	White-browed Babbler	LC									X
Neosittidae Sitellas											
Daphoenositta chrysoptera	Varied Sittella	Bh LC		X			X	X	X	X	X
Pachycephalidae Crested Shrike-tit, Crested Bellbird, Shrike Thrushes, Whistlers											
Colluricincla harmonica	Grey Shrike-thrush	Bh LC	X	X	X	X	X	X	X	X	X
Pachycephala pectoralis	Golden Whistler	Bh LC	X	X	X	X	X	X	X	X	X
Pachycephala rufiventris	Rufous Whistler	LC		X					X		X
Dicruridae Monarchs, Magpie Lark, Flycatchers, Fantails, Drongo											
Rhipidura fuliginosa	Grey Fantail	LC	X	X	X	X	X	X	X	X	X
Rhipidura leucophrys	Willie Wagtail	LC			X	X	X	X	X	X	X
Campephagidae Cuckoo-shrikes, Trillers											
Coracina novaehollandiae	Black-faced Cuckoo-shrike	LC	X		X	X	X	X	X	X	X
Lalage sueurii	White-winged Triller	LC						X	X		

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

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Hirundinidae Swallows, Martins											
Hirundo neoxena	Welcome Swallow	LC			X	X	X	X	X	X	X
Hirundo nigricans	Tree Martin	LC	X	X		X	X	X	X	X	X
Sylviidae Old World Warblers											
Cincloramphus cruralis	Brown Songlark	LC							X		X
Cincloramphus mathewsi	Rufous Songlark	LC							X		X
Zosteropidae White-eyes											
Zosterops lateralis	Silvereye	LC		X	X	X	X	X	X	X	X

Mammals

Tachyglossidae Echidnas											
Tachyglossus aculeatus	Echidna	LC	X					X	X		X

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Dasyuridae Carnivorous Marsupials											
Antechinus flavipes	Yellow-footed Antechinus, Mardo	LC		X							X
Dasyurus geoffroii	Chuditch	S3 VU VU NT									X
Phascogale tapoatafa ssp	Southern Brush-tailed Phascogale	S3 NT									X
Sminthopsis griseoventer	Grey-bellied Dunnart	LC			X	X	X	X	X		X
Peramelidae Bandicoots											
Isoodon obesulus fusciventer	Southern Brown Bandicoot	P4 LC			X		X	X	X		X
Phalangeridae Brushtail Possums, Cuscuses											
Trichosurus vulpecula	Common Brushtail Possum	LC		X			X	X		X	X
Burramyidae Pygmy Possums											
Cercartetus concinnus	Western Pygmy-possum	LC						X			X
Tarsipedidae Honey Possum											
Tarsipes rostratus	Honey Possum	LC			X			X	X		X

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Macropodidae Kangaroos, Wallabies											
Macropus fuliginosus	Western Grey Kangaroo	LC	X	X	X	X	X	X	X	X	X
Macropus irma	Western Brush Wallaby	P4 LC							X		X
Molossidae Freetail Bats											
Austronomus australis	White-striped Freetail-bat	LC		X			X				X
Ozimops kitcheneri	Western Freetail Bat	LC		X			X				
Vespertilionidae Ordinary Bats											
Chalinolobus gouldii	Gould`s Wattled Bat	LC		X		X	X			X	X
Chalinolobus morio	Chocolate Wattled Bat	LC		X	X	X	X		X		X
Falsistrellus mackenziei	Western False Pipistrelle	P4 NT		X	X	X	X			X	X
Nyctophilus geoffroyi	Lesser Long-eared Bat	LC			X	X	X		X		X
Nyctophilus gouldi	Gould`s Long-eared Bat	LC									X
Nyctophilus major major	Western Long-eared Bat					X	X				
Vespadelus regulus	Southern Forest Bat	LC		X	X	X	X		X	X	X

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Muridae Rats, Mice											
Mus musculus	House Mouse	Introduced		X	X	X		X	X	X	X
Rattus fuscipes	Western Bush Rat	LC		X	X	X	X	X	X		X
Rattus rattus	Black Rat	Introduced		X		X	X	X		X	X
Canidae Dogs, Foxes											
Canis lupus	Dog	Introduced		X	X						X
Vulpes vulpes	Red Fox	Introduced		X		X	X	X	X	X	X
Felidae Cats											
Felis catus	Cat	Introduced			X			X	X	X	
Suidae Pigs											
Sus scrofa	Pig	Introduced		X				X			X
Leporidae Rabbits, Hares											
Oryctolagus cuniculus	Rabbit	Introduced			X	X	X	X	X	X	

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APPENDIX C

DPaW NATUREMAP & PROTECTED MATTERS SEARCH TOOL RESULTS

NatureMap
Mapping Western Australia's biodiversity

NatureMap - Jalbaragup

Created By Greg Harewood on 15/12/2016

Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 35' 54" E,34° 01' 34" S
Buffer 40km
Group By Species Group

Species Group	Species	Records
Amphibian	18	523
Bird	161	11235
Fish	28	171
Invertebrate	1151	6864
Mammal	38	693
Reptile	39	751
TOTAL	**1435**	**20237**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Amphibian					
1.	25398	*Crinia georgiana (Quacking Frog)*			
2.	25399	*Crinia glauerti (Clicking Frog)*			
3.	25400	*Crinia insignifera (Squelching Froglet)*			
4.	25401	*Crinia pseudinsignifera (Bleating Froglet)*			
5.	25403	*Geocrinia alba (White-bellied Frog)*		T	
6.	25404	*Geocrinia leai (Ticking Frog)*			
7.	25405	*Geocrinia lutea (Walpole Frog, Nornalup Frog)*		P4	
8.	25406	*Geocrinia rosea (Roseate Frog)*			
9.	25407	*Geocrinia vitellina (Orange-bellied Frog)*		T	Y
10.	25410	*Heleioporus eyrei (Moaning Frog)*			
11.	25411	*Heleioporus inornatus (Whooping Frog)*			
12.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
13.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
14.	25388	*Litoria moorei (Motorbike Frog)*			
15.	25419	*Metacrinia nichollsi (Forest Toadlet)*			
16.	25421	*Neobatrachus albipes (White-footed Trilling Frog)*			
17.	25425	*Neobatrachus kunapalari (Kunapalari Frog)*			
18.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
Bird					
19.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
20.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
21.	24262	*Acanthiza inornata (Western Thornbill)*			
22.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
23.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
24.	25536	*Accipiter fasciatus (Brown Goshawk)*			
25.	24282	*Accipiter fasciatus subsp. fasciatus (Brown Goshawk)*			
26.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
27.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
28.	24312	*Anas gracilis (Grey Teal)*			
29.	24313	*Anas platyrhynchos (Mallard)*			
30.	24315	*Anas rhynchotis (Australasian Shoveler)*			
31.	24316	*Anas superciliosa (Pacific Black Duck)*			
32.		*Anhinga novaehollandiae*			
33.	24561	*Anthochaera carunculata (Red Wattlebird)*			
34.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
35.	25670	*Anthus australis (Australian Pipit)*			
36.	24285	*Aquila audax (Wedge-tailed Eagle)*			
37.	25538	*Aquila morphnoides (Little Eagle)*			
38.	41324	*Ardea modesta (Eastern Great Egret)*		IA	
39.	24340	*Ardea novaehollandiae (White-faced Heron)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
40.	24341	*Ardea pacifica (White-necked Heron)*			
41.	24610	*Ardeotis australis (Australian Bustard)*			
42.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
43.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
44.	24318	*Aythya australis (Hardhead)*			
45.		*Barnardius zonarius*			
46.	24319	*Biziura lobata (Musk Duck)*			
47.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
48.	24427	*Cacomantis flabelliformis subsp. flabelliformis (Fan-tailed Cuckoo)*			
49.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
50.	24269	*Calamanthus campestris (Rufous Fieldwren)*			
51.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
52.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black-Cockatoo)*		T	
53.	24733	*Calyptorhynchus baudinii (Baudin's Cockatoo (long-billed black-cockatoo), Baudin's Cockatoo)*		T	
54.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)*		T	
55.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
56.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
57.		*Chroicocephalus novaehollandiae*			
58.	25601	*Chrysococcyx lucidus (Shining Bronze Cuckoo)*			
59.	24833	*Cincloramphus cruralis (Brown Songlark)*			
60.	24834	*Cincloramphus mathewsi (Rufous Songlark)*			
61.	24288	*Circus approximans (Swamp Harrier)*			
62.	24396	*Climacteris rufa (Rufous Treecreeper)*			
63.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
64.	24613	*Colluricincla harmonica subsp. rufiventris (Grey Shrike-thrush)*			
65.	24399	*Columba livia (Domestic Pigeon)*	Y		
66.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
67.	25592	*Corvus coronoides (Australian Raven)*			
68.	24671	*Coturnix pectoralis (Stubble Quail)*			
69.	25595	*Cracticus tibicen (Australian Magpie)*			
70.	25596	*Cracticus torquatus (Grey Butcherbird)*			
71.	24322	*Cygnus atratus (Black Swan)*			
72.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
73.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
74.	24606	*Daphoenositta chrysoptera subsp. pileata (Varied Sittella, Black-capped Sitella)*			
75.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
76.	24470	*Dromaius novaehollandiae (Emu)*			
77.		*Egretta novaehollandiae*			
78.		*Elanus axillaris*			
79.		*Elseyornis melanops*			
80.		*Eolophus roseicapillus*			
81.	24651	*Eopsaltria australis subsp. griseogularis (Western Yellow Robin)*			
82.	24652	*Eopsaltria georgiana (White-breasted Robin)*			
83.	24567	*Epthianura albifrons (White-fronted Chat)*			
84.	25621	*Falco berigora (Brown Falcon)*			
85.	25622	*Falco cenchroides (Australian Kestrel)*			
86.	25623	*Falco longipennis (Australian Hobby)*			
87.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
88.	25677	*Falcunculus frontatus (Crested Shrike-tit)*			
89.	24616	*Falcunculus frontatus subsp. leucogaster (Western Shrike-tit, Crested Shrike-tit)*			
90.	25727	*Fulica atra (Eurasian Coot)*			
91.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
92.	25530	*Gerygone fusca (Western Gerygone)*			
93.	24735	*Glossopsitta porphyrocephala (Purple-crowned Lorikeet)*			
94.	24443	*Grallina cyanoleuca (Magpie-lark)*			
95.	25627	*Haematopus fuliginosus (Sooty Oystercatcher)*			
96.	24487	*Haematopus longirostris (Pied Oystercatcher)*			
97.	24293	*Haliaeetus leucogaster (White-bellied Sea-Eagle)*		IA	
98.	24295	*Haliastur sphenurus (Whistling Kite)*			
99.	25734	*Himantopus himantopus (Black-winged Stilt)*			
100.	24491	*Hirundo neoxena (Welcome Swallow)*			
101.	25629	*Hirundo nigricans (Tree Martin)*			
102.		*Hydroprogne caspia*			
103.	25638	*Larus pacificus (Pacific Gull)*			
104.	24557	*Leipoa ocellata (Malleefowl)*		T	
105.	25661	*Lichmera indistincta (Brown Honeyeater)*			
106.		*Lophoictinia isura*			
107.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			

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108.	25650	*Malurus elegans (Red-winged Fairy-wren)*			
109.	25654	*Malurus splendens (Splendid Fairy-wren)*			
110.	24552	*Malurus splendens subsp. splendens (Splendid Fairy-wren)*			
111.	25758	*Megalurus gramineus (Little Grassbird)*			
112.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
113.	24587	*Melithreptus chloropsis (Western White-naped Honeyeater)*			
114.	24598	*Merops ornatus (Rainbow Bee-eater)*		IA	
115.		*Microcarbo melanoleucos*			
116.	25542	*Milvus migrans (Black Kite)*			
117.	25610	*Myiagra inquieta (Restless Flycatcher)*			
118.	24738	*Neophema elegans (Elegant Parrot)*			
119.	25748	*Ninox novaeseelandiae (Boobook Owl)*			
120.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
121.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
122.	24328	*Oxyura australis (Blue-billed Duck)*		P4	
123.	25679	*Pachycephala pectoralis (Golden Whistler)*			
124.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
125.	24299	*Pandion haliaetus subsp. cristatus (Osprey)*			
126.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
127.	24625	*Pardalotus punctatus subsp. punctatus (Spotted Pardalote)*			
128.	24626	*Pardalotus punctatus subsp. xanthopyge (Yellow-rumped Pardalote)*			
129.	25682	*Pardalotus striatus (Striated Pardalote)*			
130.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
131.	25695	*Petroica multicolor (Scarlet Robin)*			
132.	25697	*Phalacrocorax carbo (Great Cormorant)*			
133.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
134.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
135.	25699	*Phalacrocorax varius (Pied Cormorant)*			
136.	24409	*Phaps chalcoptera (Common Bronzewing)*			
137.	25587	*Phaps elegans (Brush Bronzewing)*			
138.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
139.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
140.	24842	*Platalea regia (Royal Spoonbill)*			
141.	25720	*Platycercus icterotis (Western Rosella)*			
142.	24745	*Platycercus icterotis subsp. icterotis (Western Rosella)*			
143.	24747	*Platycercus spurius (Red-capped Parrot)*			
144.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
145.	24750	*Platycercus zonarius subsp. semitorquatus (Twenty-eight Parrot)*			
146.	24751	*Platycercus zonarius subsp. zonarius (Port Lincoln Parrot)*			
147.	24843	*Plegadis falcinellus (Glossy Ibis)*		IA	
148.	25703	*Podargus strigoides (Tawny Frogmouth)*			
149.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
150.	25722	*Polytelis anthopeplus (Regent Parrot)*			
151.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
152.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
153.	24771	*Porzana tabuensis (Spotless Crake)*			
154.		*Purpureicephalus spurius*			
155.	25613	*Rhipidura fuliginosa (Grey Fantail)*			
156.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
157.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
158.	24279	*Sericornis frontalis subsp. maculatus (White-browed Scrubwren)*			
159.	30948	*Smicrornis brevirostris (Weebill)*			
160.	24645	*Stagonopleura oculata (Red-eared Firetail)*			
161.	24529	*Sterna leucoptera (White-winged Black Tern)*		IA	
162.	25655	*Stipiturus malachurus (Southern Emu-wren)*			
163.	24554	*Stipiturus malachurus subsp. westernensis (Southern Emu-wren)*			
164.	25597	*Strepera versicolor (Grey Currawong)*			
165.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
166.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
167.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
168.		*Thalasseus bergii*			
169.		*Thinornis rubricollis*			
170.	24844	*Threskiornis molucca (Australian White Ibis)*			
171.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
172.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
173.	24808	*Tringa nebularia (Common Greenshank)*		IA	
174.		*Turdus merula subsp. merula*			Y
175.	24852	*Tyto alba subsp. delicatula (Barn Owl)*			
176.	24855	*Tyto novaehollandiae subsp. novaehollandiae (Masked Owl (southern subsp))*		P3	
177.	24386	*Vanellus tricolor (Banded Lapwing)*			

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178.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			
179.	24856	*Zosterops lateralis subsp. gouldi (Grey-breasted White-eye)*			
Fish					
180.		*? ?*			
181.		*Acanthistius pardalotus*			
182.		*Aploactisoma milesii*			
183.		*Bodianus vulpinus*			
184.		*Bostockia porosa*			
185.		*Cnidoglanis macrocephalus*			
186.		*Dinolestes lewini*			
187.		*Edelia vittata*			
188.		*Engraulis australis*			
189.		*Epinephelides armatus*			
190.	34028	*Galaxias occidentalis (Western Minnow)*			
191.	34026	*Galaxiella munda (Western Mud Minnow)*		T	
192.	34027	*Galaxiella nigrostriata (Black-stripe Minnow)*		P3	
193.		*Galaxiella sp.*			
194.	34030	*Geotria australis (Pouched Lamprey)*		P1	
195.		*Girella zebra*			
196.		*Histiophryne cryptacanthus*			
197.		*Lepidogalaxias salamandroides*			
198.		*Meuschenia flavolineata*			
199.	34033	*Nannatherina balstoni (Balston's Pygmy Perch)*		T	
200.		*Nannoperca vittata*			
201.		*Paraplesiops meleagris*			
202.		*Pomatomus saltatrix*			
203.		*Pseudorhombus jenynsii*			
204.		*Torquigener pleurogramma*			
205.		*Trachinops brauni*			
206.		*Trachinops noarlungae*			
207.		*Upeneichthys lineatus*			
Invertebrate					
208.		*Aades sp. fc2418*			
209.		*Abantiades hydrographis*			
210.		*Abantiades ocellatus*			
211.		*Abantiades sp. fc761*			
212.		*Ablabesmyia notabilis*			
213.		*Ablabesmyia sp. V37*			
214.		*Acantholophus hypoleucus*			
215.		*Acantholophus sp. fc1409*			
216.		*Acantholophus sp. fc1523*			
217.		*Acantholophus sp. fc1775*			
218.		*Acantholophus sp. fc2091*			
219.		*Acariformes sp.*			
220.		*Acritoptila globosa*			
221.		*Acritoptila margaretae*			
222.		*Acritoptila sp.*			
223.		*Adreppus sp. fc1323*			
224.		*Adreppus sp. fc868*			
225.		*Aeshnidae sp.*			
226.		*Agraptocorixa parvipunctata*			
227.		*Agrotis munda*			
228.		*Allodessus bistrigatus*			
229.		*Allothereua maculata*			
230.		*Alotanypus dalyupensis*			
231.		*Ambicodamus marae*			
232.		*Amorbus bispinus*			
233.		*Amphisopodidae sp.*			
234.		*Ancylidae sp.*			
235.		*Anisops hyperion*			
236.		*Anisops sp.*			
237.		*Anthela ferruginosa*			
238.		*Antiporus femoralis*			
239.		*Antiporus occidentalis*			
240.		*Antiporus sp.*			
241.		*Aphroteniinae sp.*			
242.		*Apis mellifera*			
243.		*Aposites sp. fc1917*			Y
244.		*Apsectrotanypus maculosus*			Y

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245.		*Apsectrotanypus nr maculosa*			
246.		*Apterogryllus sp. fc811*			
247.		*Arachnura higginsi*			
248.		*Araneus cyphoxis*			
249.		*Araneus eburneiventris*			
250.		*Araneus senicaudatus*			
251.		*Archaeosynthemis leachii*			
252.		*Archaeosynthemis occidentalis*			
253.		*Archaeosynthemis spiniger*			
254.		*Archiargiolestes pusillus*			
255.		*Archiargiolestes sp.*			Y
256.		*Archichauliodes sp.*			
257.		*Archichauliodes sp. fc1901*			Y
258.		*Arcina fulgorigera*			
259.		*Argiope protensa*			
260.		*Arhodia sp. fc2*			
261.		*Arhodia sp. fc320*			
262.		*Arhodia sp. fc79*			
263.		*Arkys walckenaeri*			
264.		*Arrenuridae sp.*			
265.		*Arrenurus sp.*			
266.		*Artoria cingulipes*			
267.		*Artoria linnaei*			
268.		*Artoria schizocoides*			
269.		*Artoria taeniifera*			
270.		*Athericidae sp.*			
271.		*Atriplectides dubius*			
272.		*Atriplectididae sp.*			
273.		*Aturidae sp.*			
274.		*Austracantha minax*			
275.		*Australopelopia prionoptera*			
276.		*Australotiphys barmutai*			
277.		*Austroaeschna anacantha*			
278.		*Austrocorduliidae sp.*			
279.		*Austrogomphus (Zephyrogomphus) lateralis*			
280.		*Austrolestes analis*			
281.		*Austroleus annulosus*			Y
282.	33972	*Austromerope poultoni (scorpionfly)*		P2	
283.		*Austrosynthemis cyanitincta*			
284.		*Baetidae sp.*			
285.		*Baiami sp. fc732*			
286.		*Baiami tegenarioides*			
287.		*Baiami volucripes*			
288.		*Batrachomatus nannup (formerly Allomatus genus)*			Y
289.		*Batrachomatus sp. (formerly Allomatus sp.)*			Y
290.		*Berosus approximans*			
291.		*Bibulmena kadjina*			
292.		*Bidessini sp.*			
293.		*Bolborhachium sp. fc1836*			Y
294.		*Botryocladius bibulmun*			
295.		*Botryocladius freemani*			
296.		*Botryocladius sp. 1*			Y
297.		*Brentidae sp.*			
298.		*Caedicia sp. fc485*			
299.		*Caenidae sp.*			
300.		*Calanoida sp.*			
301.		*Calolampra sp. fc147*			
302.		*Calymmachernes angulatus*			
303.		*Camponotus sp. fc423*			
304.		*Carabidae sp.*			
305.		*Carenum sp. fc280*			
306.		*Carthaea saturnioides*			
307.		*Castiarina sp. fc1890*			Y
308.		*Catasarcus sp. fc2051*			
309.		*Ceinidae sp.*			
310.		*Ceratopogonidae sp.*			
311.		*Cercophonius sulcatus*			
312.		*Chauliognathus sp. fc795*			
313.		*Chenistonia sp. fc721*			
314.		*Chenistonia villosa*			

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315.	33939	*Cherax cainii (Marron)*			
316.		*Cherax crassimanus*			
317.		*Cherax destructor*			
318.		*Cherax preissii*			
319.		*Cherax quinquecarinatus*			
320.	33940	*Cherax tenuimanus (Margaret River Marron, Hairy Marron)*		T	
321.		*Chironomidae sp.*			
322.		*Chironominae sp.*			
323.		*Chironomus aff. alternans (V24) (CB)*			
324.		*Chironomus occidentalis*			
325.		*Chironomus sp.*			
326.		*Chironomus tepperi*			
327.		*Chlorocoma dicloraria*			
328.		*Chlorocoma sp. fc22*			
329.		*Chrysomelidae sp.*			
330.		*Chrysopa sp. fc822*			
331.		*Cladocera (unident.)*			
332.		*Cladopelma curtivalva*			
333.		*Cladotanytarsus sp. A (SAP)*			
334.		*Clilopocha sp. fc1846*			
335.		*Cloeon sp. 2 (SFM)*			
336.		*Coenagrionidae sp.*			
337.		*Colpochila antennalis*			
338.		*Colpochila major*			
339.		*Colpochila sp. fc1823*			
340.		*Colpochila sp. fc1866*			
341.		*Colpochila sp. fc2006*			
342.		*Condocerus aptus*			
343.		*Conicochernes crassus*			
344.		*Conoderus sp. fc1062*			
345.		*Conoderus sp. fc1109*			
346.		*Conoderus sp. fc135*			
347.		*Conoderus sp. fc1818*			
348.		*Conoderus sp. fc1819*			
349.		*Conoderus sp. fc26*			
350.		*Conoderus sp. fc444*			
351.		*Conoderus sp. fc909*			
352.		*Copelatus sp.*			
353.		*Copepoda sp.*			
354.		*Copidita sp. fc1958*			Y
355.		*Copidita sp. fc1962*			Y
356.		*Coptocercus rubripes*			
357.		*Corduliidae sp.*			
358.		*Corixidae sp.*			
359.		*Cormocephalus aurantiipes*			
360.		*Cormocephalus hartmeyeri*			
361.		*Corydalidae sp.*			
362.		*Corynoneura sp. (V49) (SAP)*			
363.		*Coryphistes sp. fc231*			
364.		*Cricotopus 'brevicornis'*			
365.		*Cricotopus 'parbicinctus'*			
366.		*Crypsiphona ocultaria*			
367.		*Cryptodus sp. fc1160*			
368.		*Cryptodus sp. fc189*			
369.		*Culicidae sp.*			
370.		*Curculionidae sp.*			
371.		*Cyclopoida sp.*			
372.		*Cyclosa trilobata*			
373.		*Danima banksiae*			
374.		*Dasyheleinae sp.*			
375.		*Destolmia sp. fc1839*			Y
376.		*Destolmia sp. fc4*			
377.		*Dichromodes personalis*			
378.		*Dicrotendipes jobetus*			
379.		*Dicrotendipes sp. A (V47) (SAP)*			
380.		*Diphucephala sp. fc1889*			Y
381.		*Diphucephala sp. fc1985*			Y
382.		*Doratifera sp. fc1625*			
383.		*Doratifera sp. fc332*			
384.		*Doratifera sp. fc398*			

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385.		*Doratifera sp. fc81*			
386.		*Dugesiidae sp.*			
387.		*Dytiscidae sp.*			
388.		*Ecnomidae sp.*			
389.		*Ecnomina E group sp. 5*			Y
390.		*Ecnomus sp.*			
391.		*Ecphantus quadrilobus sp nova*			
392.		*Ectropis sp. fc23*			
393.		*Edusella sp. fc101*			
394.		*Edusella sp. fc115*			Y
395.		*Emertonella maga*			
396.		*Empididae sp.*			
397.		*Enchytraeidae sp.*			
398.	33945	*Engaewa pseudoreducta (Margaret River Burrowing Crayfish)*		T	
399.		*Enochrus eyrensis*			
400.		*Entometa fervens*			
401.		*Entometa sp. fc426*			
402.		*Ephydridae sp.*			
403.		*Epicoma melanostica*			
404.		*Eriophora sp. fc1680*			
405.		*Ethmostigmus sp. fc223*			
406.		*Ethmostigmus sp. fc224*			
407.		*Eucyclodes buprestaria*			
408.		*Euloxia sp. fc1179*			
409.		*Exocelina ater*			
410.		*Forcypomyinae sp.*			
411.		*Gasteracantha minax*			
412.		*Gelastocoridae sp.*			
413.		*Genus fc100 sp. fc100*			
414.		*Genus fc1007 sp. fc1007*			
415.		*Genus fc102 sp. fc102*			Y
416.		*Genus fc1022 sp. fc1022*			
417.		*Genus fc1029 sp. fc1029*			
418.		*Genus fc1034 sp. fc1034*			
419.		*Genus fc1038 sp. fc1038*			
420.		*Genus fc104 sp. fc104*			
421.		*Genus fc1042 sp. fc1042*			
422.		*Genus fc1043 sp. fc1043*			
423.		*Genus fc1046 sp. fc1046*			
424.		*Genus fc1049 sp. fc1049*			
425.		*Genus fc105 sp. fc105*			
426.		*Genus fc1051 sp. fc1051*			
427.		*Genus fc1055 sp. fc1055*			
428.		*Genus fc1057 sp. fc1057*			
429.		*Genus fc106 sp. fc106*			
430.		*Genus fc1068 sp. fc1068*			
431.		*Genus fc107 sp. fc107*			
432.		*Genus fc1071 sp. fc1071*			
433.		*Genus fc1075 sp. fc1075*			
434.		*Genus fc108 sp. fc108*			
435.		*Genus fc1081 sp. fc1081*			
436.		*Genus fc1083 sp. fc1083*			
437.		*Genus fc109 sp. fc109*			
438.		*Genus fc110 sp. fc110*			Y
439.		*Genus fc1101 sp. fc1101*			
440.		*Genus fc1105 sp. fc1105*			
441.		*Genus fc1110 sp. fc1110*			
442.		*Genus fc1126 sp. fc1126*			
443.		*Genus fc1128 sp. fc1128*			
444.		*Genus fc1134 sp. fc1134*			
445.		*Genus fc1135 sp. fc1135*			
446.		*Genus fc1139 sp. fc1139*			
447.		*Genus fc114 sp. fc114*			
448.		*Genus fc1146 sp. fc1146*			
449.		*Genus fc1150 sp. fc1150*			
450.		*Genus fc1153 sp. fc1153*			
451.		*Genus fc116 sp. fc116*			Y
452.		*Genus fc1169 sp. fc1169*			
453.		*Genus fc117 sp. fc117*			Y
454.		*Genus fc1170 sp. fc1170*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
455.		*Genus fc118 sp. fc118*			Y
456.		*Genus fc1195 sp. fc1195*			
457.		*Genus fc12 sp. fc12*			
458.		*Genus fc1203 sp. fc1203*			
459.		*Genus fc123 sp. fc123*			
460.		*Genus fc125 sp. fc125*			Y
461.		*Genus fc126 sp. fc126*			
462.		*Genus fc127 sp. fc127*			
463.		*Genus fc128 sp. fc128*			
464.		*Genus fc129 sp. fc129*			
465.		*Genus fc1297 sp. fc1297*			
466.		*Genus fc130 sp. fc130*			
467.		*Genus fc1303 sp. fc1303*			
468.		*Genus fc1305 sp. fc1305*			
469.		*Genus fc131 sp. fc131*			
470.		*Genus fc1315 sp. fc1315*			
471.		*Genus fc132 sp. fc132*			
472.		*Genus fc1325 sp. fc1325*			
473.		*Genus fc1345 sp. fc1345*			
474.		*Genus fc1367 sp. fc1367*			
475.		*Genus fc1385 sp. fc1385*			
476.		*Genus fc139 sp. fc139*			
477.		*Genus fc1390 sp. fc1390*			
478.		*Genus fc14 sp. fc14*			
479.		*Genus fc1401 sp. fc1401*			
480.		*Genus fc1404 sp. fc1404*			
481.		*Genus fc1429 sp. fc1429*			
482.		*Genus fc144 sp. fc144*			
483.		*Genus fc145 sp. fc145*			
484.		*Genus fc1458 sp. fc1458*			
485.		*Genus fc1459 sp. fc1459*			
486.		*Genus fc146 sp. fc146*			
487.		*Genus fc1479 sp. fc1479*			Y
488.		*Genus fc148 sp. fc148*			
489.		*Genus fc1485 sp. fc1485*			
490.		*Genus fc1489 sp. fc1489*			
491.		*Genus fc149 sp. fc149*			
492.		*Genus fc1490 sp. fc1490*			
493.		*Genus fc1491 sp. fc1491*			
494.		*Genus fc1494 sp. fc1494*			
495.		*Genus fc1495 sp. fc1495*			
496.		*Genus fc150 sp. fc150*			
497.		*Genus fc1503 sp. fc1503*			
498.		*Genus fc151 sp. fc151*			
499.		*Genus fc1524 sp. fc1524*			
500.		*Genus fc153 sp. fc153*			
501.		*Genus fc1531 sp. fc1531*			
502.		*Genus fc1538 sp. fc1538*			
503.		*Genus fc1541 sp. fc1541*			
504.		*Genus fc1548 sp. fc1548*			
505.		*Genus fc1586 sp. fc1586*			
506.		*Genus fc1587 sp. fc1587*			
507.		*Genus fc1588 sp. fc1588*			
508.		*Genus fc16 sp. fc16*			
509.		*Genus fc1626 sp. fc1626*			
510.		*Genus fc1627 sp. fc1627*			
511.		*Genus fc1628 sp. fc1628*			
512.		*Genus fc163 sp. fc163*			
513.		*Genus fc1630 sp. fc1630*			
514.		*Genus fc1633 sp. fc1633*			
515.		*Genus fc1647 sp. fc1647*			
516.		*Genus fc1657 sp. fc1657*			
517.		*Genus fc1666 sp. fc1666*			
518.		*Genus fc1675 sp. fc1675*			
519.		*Genus fc1677 sp. fc1677*			
520.		*Genus fc1683 sp. fc1683*			
521.		*Genus fc1697 sp. fc1697*			
522.		*Genus fc1725 sp. fc1725*			
523.		*Genus fc174 sp. fc174*			
524.		*Genus fc1758 sp. fc1758*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
525.		*Genus fc1771 sp. fc1771*			
526.		*Genus fc178 sp. fc178*			
527.		*Genus fc1780 sp. fc1780*			
528.		*Genus fc1788 sp. fc1788*			
529.		*Genus fc1790 sp. fc1790*			
530.		*Genus fc1792 sp. fc1792*			
531.		*Genus fc180 sp. fc180*			
532.		*Genus fc1817 sp. fc1817*			
533.		*Genus fc1828 sp. fc1828*			Y
534.		*Genus fc1829 sp. fc1829*			Y
535.		*Genus fc183 sp. fc183*			
536.		*Genus fc1831 sp. fc1831*			
537.		*Genus fc1832 sp. fc1832*			
538.		*Genus fc1833 sp. fc1833*			
539.		*Genus fc1834 sp. fc1834*			
540.		*Genus fc1835 sp. fc1835*			Y
541.		*Genus fc1837 sp. fc1837*			
542.		*Genus fc1838 sp. fc1838*			Y
543.		*Genus fc1840 sp. fc1840*			
544.		*Genus fc1842 sp. fc1842*			
545.		*Genus fc1843 sp. fc1843*			
546.		*Genus fc1847 sp. fc1847*			
547.		*Genus fc1848 sp. fc1848*			Y
548.		*Genus fc1849 sp. fc1849*			
549.		*Genus fc1850 sp. fc1850*			Y
550.		*Genus fc1851 sp. fc1851*			Y
551.		*Genus fc1852 sp. fc1852*			
552.		*Genus fc1853 sp. fc1853*			
553.		*Genus fc1854 sp. fc1854*			
554.		*Genus fc1857 sp. fc1857*			
555.		*Genus fc1858 sp. fc1858*			
556.		*Genus fc1859 sp. fc1859*			Y
557.		*Genus fc1861 sp. fc1861*			
558.		*Genus fc1864 sp. fc1864*			
559.		*Genus fc1865 sp. fc1865*			Y
560.		*Genus fc1869 sp. fc1869*			
561.		*Genus fc1870 sp. fc1870*			
562.		*Genus fc1872 sp. fc1872*			
563.		*Genus fc1873 sp. fc1873*			Y
564.		*Genus fc1874 sp. fc1874*			
565.		*Genus fc1875 sp. fc1875*			
566.		*Genus fc1876 sp. fc1876*			
567.		*Genus fc1882 sp. fc1882*			
568.		*Genus fc1883 sp. fc1883*			Y
569.		*Genus fc1885 sp. fc1885*			Y
570.		*Genus fc1887 sp. fc1887*			Y
571.		*Genus fc1891 sp. fc1891*			Y
572.		*Genus fc1892 sp. fc1892*			Y
573.		*Genus fc1893 sp. fc1893*			Y
574.		*Genus fc1894 sp. fc1894*			Y
575.		*Genus fc1895 sp. fc1895*			
576.		*Genus fc1896 sp. fc1896*			Y
577.		*Genus fc1898 sp. fc1898*			
578.		*Genus fc1899 sp. fc1899*			
579.		*Genus fc190 sp. fc190*			
580.		*Genus fc1900 sp. fc1900*			Y
581.		*Genus fc1903 sp. fc1903*			
582.		*Genus fc1905 sp. fc1905*			Y
583.		*Genus fc1906 sp. fc1906*			
584.		*Genus fc1907 sp. fc1907*			
585.		*Genus fc1908 sp. fc1908*			
586.		*Genus fc1909 sp. fc1909*			
587.		*Genus fc1910 sp. fc1910*			
588.		*Genus fc1911 sp. fc1911*			Y
589.		*Genus fc1912 sp. fc1912*			Y
590.		*Genus fc1913 sp. fc1913*			
591.		*Genus fc1914 sp. fc1914*			Y
592.		*Genus fc1915 sp. fc1915*			
593.		*Genus fc1919 sp. fc1919*			Y
594.		*Genus fc1920 sp. fc1920*			Y

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
595.		*Genus fc1921 sp. fc1921*			Y
596.		*Genus fc1922 sp. fc1922*			
597.		*Genus fc1924 sp. fc1924*			
598.		*Genus fc1925 sp. fc1925*			Y
599.		*Genus fc1926 sp. fc1926*			
600.		*Genus fc1927 sp. fc1927*			Y
601.		*Genus fc1928 sp. fc1928*			Y
602.		*Genus fc1929 sp. fc1929*			Y
603.		*Genus fc1930 sp. fc1930*			Y
604.		*Genus fc1931 sp. fc1931*			Y
605.		*Genus fc1933 sp. fc1933*			
606.		*Genus fc1934 sp. fc1934*			Y
607.		*Genus fc1935 sp. fc1935*			Y
608.		*Genus fc1937 sp. fc1937*			Y
609.		*Genus fc1938 sp. fc1938*			
610.		*Genus fc1939 sp. fc1939*			Y
611.		*Genus fc1940 sp. fc1940*			Y
612.		*Genus fc1942 sp. fc1942*			Y
613.		*Genus fc1943 sp. fc1943*			Y
614.		*Genus fc1944 sp. fc1944*			
615.		*Genus fc1946 sp. fc1946*			Y
616.		*Genus fc1947 sp. fc1947*			
617.		*Genus fc1948 sp. fc1948*			
618.		*Genus fc1949 sp. fc1949*			Y
619.		*Genus fc1952 sp. fc1952*			Y
620.		*Genus fc1953 sp. fc1953*			Y
621.		*Genus fc1954 sp. fc1954*			Y
622.		*Genus fc1955 sp. fc1955*			
623.		*Genus fc1956 sp. fc1956*			Y
624.		*Genus fc1957 sp. fc1957*			Y
625.		*Genus fc1959 sp. fc1959*			Y
626.		*Genus fc1961 sp. fc1961*			Y
627.		*Genus fc1963 sp. fc1963*			Y
628.		*Genus fc1964 sp. fc1964*			
629.		*Genus fc1965 sp. fc1965*			Y
630.		*Genus fc1966 sp. fc1966*			
631.		*Genus fc1967 sp. fc1967*			Y
632.		*Genus fc1968 sp. fc1968*			
633.		*Genus fc1970 sp. fc1970*			Y
634.		*Genus fc1971 sp. fc1971*			
635.		*Genus fc1972 sp. fc1972*			Y
636.		*Genus fc1974 sp. fc1974*			Y
637.		*Genus fc1976 sp. fc1976*			
638.		*Genus fc1977 sp. fc1977*			
639.		*Genus fc1979 sp. fc1979*			
640.		*Genus fc1980 sp. fc1980*			Y
641.		*Genus fc1981 sp. fc1981*			Y
642.		*Genus fc1982 sp. fc1982*			
643.		*Genus fc1983 sp. fc1983*			
644.		*Genus fc1986 sp. fc1986*			Y
645.		*Genus fc1987 sp. fc1987*			Y
646.		*Genus fc1988 sp. fc1988*			Y
647.		*Genus fc1991 sp. fc1991*			Y
648.		*Genus fc1993 sp. fc1993*			
649.		*Genus fc1994 sp. fc1994*			
650.		*Genus fc1995 sp. fc1995*			
651.		*Genus fc1997 sp. fc1997*			Y
652.		*Genus fc2001 sp. fc2001*			
653.		*Genus fc2002 sp. fc2002*			Y
654.		*Genus fc2004 sp. fc2004*			Y
655.		*Genus fc2005 sp. fc2005*			
656.		*Genus fc2009 sp. fc2009*			Y
657.		*Genus fc2010 sp. fc2010*			Y
658.		*Genus fc2012 sp. fc2012*			
659.		*Genus fc2014 sp. fc2014*			Y
660.		*Genus fc2016 sp. fc2016*			
661.		*Genus fc2017 sp. fc2017*			Y
662.		*Genus fc2018 sp. fc2018*			Y
663.		*Genus fc2020 sp. fc2020*			Y
664.		*Genus fc2021 sp. fc2021*			Y

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
665.		*Genus fc2022 sp. fc2022*			
666.		*Genus fc2023 sp. fc2023*			Y
667.		*Genus fc2024 sp. fc2024*			
668.		*Genus fc2025 sp. fc2025*			
669.		*Genus fc2026 sp. fc2026*			Y
670.		*Genus fc2028 sp. fc2028*			Y
671.		*Genus fc203 sp. fc203*			
672.		*Genus fc2030 sp. fc2030*			Y
673.		*Genus fc2031 sp. fc2031*			
674.		*Genus fc2032 sp. fc2032*			Y
675.		*Genus fc2036 sp. fc2036*			Y
676.		*Genus fc2037 sp. fc2037*			
677.		*Genus fc2047 sp. fc2047*			Y
678.		*Genus fc2049 sp. fc2049*			
679.		*Genus fc2050 sp. fc2050*			
680.		*Genus fc2052 sp. fc2052*			
681.		*Genus fc2053 sp. fc2053*			Y
682.		*Genus fc2054 sp. fc2054*			
683.		*Genus fc2055 sp. fc2055*			
684.		*Genus fc2056 sp. fc2056*			Y
685.		*Genus fc2057 sp. fc2057*			Y
686.		*Genus fc2058 sp. fc2058*			Y
687.		*Genus fc206 sp. fc206*			
688.		*Genus fc2060 sp. fc2060*			Y
689.		*Genus fc2062 sp. fc2062*			Y
690.		*Genus fc2063 sp. fc2063*			Y
691.		*Genus fc2064 sp. fc2064*			
692.		*Genus fc2065 sp. fc2065*			
693.		*Genus fc2067 sp. fc2067*			Y
694.		*Genus fc2068 sp. fc2068*			Y
695.		*Genus fc2072 sp. fc2072*			Y
696.		*Genus fc2073 sp. fc2073*			Y
697.		*Genus fc2075 sp. fc2075*			Y
698.		*Genus fc2076 sp. fc2076*			Y
699.		*Genus fc2077 sp. fc2077*			Y
700.		*Genus fc2078 sp. fc2078*			Y
701.		*Genus fc2079 sp. fc2079*			Y
702.		*Genus fc2080 sp. fc2080*			Y
703.		*Genus fc2082 sp. fc2082*			Y
704.		*Genus fc2083 sp. fc2083*			Y
705.		*Genus fc2086 sp. fc2086*			Y
706.		*Genus fc2087 sp. fc2087*			Y
707.		*Genus fc2089 sp. fc2089*			
708.		*Genus fc2093 sp. fc2093*			Y
709.		*Genus fc2094 sp. fc2094*			
710.		*Genus fc2095 sp. fc2095*			
711.		*Genus fc2096 sp. fc2096*			Y
712.		*Genus fc2097 sp. fc2097*			Y
713.		*Genus fc2098 sp. fc2098*			Y
714.		*Genus fc2099 sp. fc2099*			Y
715.		*Genus fc2100 sp. fc2100*			Y
716.		*Genus fc2101 sp. fc2101*			Y
717.		*Genus fc2102 sp. fc2102*			Y
718.		*Genus fc2103 sp. fc2103*			Y
719.		*Genus fc2104 sp. fc2104*			Y
720.		*Genus fc2105 sp. fc2105*			Y
721.		*Genus fc2106 sp. fc2106*			Y
722.		*Genus fc2123 sp. fc2123*			
723.		*Genus fc2126 sp. fc2126*			
724.		*Genus fc2129 sp. fc2129*			
725.		*Genus fc2130 sp. fc2130*			
726.		*Genus fc2131 sp. fc2131*			Y
727.		*Genus fc2133 sp. fc2133*			Y
728.		*Genus fc217 sp. fc217*			
729.		*Genus fc2171 sp. fc2171*			
730.		*Genus fc221 sp. fc221*			
731.		*Genus fc225 sp. fc225*			
732.		*Genus fc226 sp. fc226*			
733.		*Genus fc228 sp. fc228*			
734.		*Genus fc229 sp. fc229*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
735.		*Genus fc236 sp. fc236*			
736.		*Genus fc24 sp. fc24*			
737.		*Genus fc241 sp. fc241*			
738.		*Genus fc2416 sp. fc2416*			
739.		*Genus fc244 sp. fc244*			
740.		*Genus fc2463 sp. fc2463*			
741.		*Genus fc2476 sp. fc2476*			
742.		*Genus fc25 sp. fc25*			
743.		*Genus fc251 sp. fc251*			
744.		*Genus fc258 sp. fc258*			
745.		*Genus fc259 sp. fc259*			
746.		*Genus fc261 sp. fc261*			
747.		*Genus fc262 sp. fc262*			
748.		*Genus fc2627 sp. fc2627*			
749.		*Genus fc2637 sp. fc2637*			
750.		*Genus fc2639 sp. fc2639*			
751.		*Genus fc2640 sp. fc2640*			Y
752.		*Genus fc2646 sp. fc2646*			
753.		*Genus fc2649 sp. fc2649*			
754.		*Genus fc2652 sp. fc2652*			
755.		*Genus fc267 sp. fc267*			
756.		*Genus fc2675 sp. fc2675*			Y
757.		*Genus fc2676 sp. fc2676*			
758.		*Genus fc2692 sp. fc2692*			Y
759.		*Genus fc2693 sp. fc2693*			
760.		*Genus fc2704 sp. fc2704*			
761.		*Genus fc286 sp. fc286*			
762.		*Genus fc2867 sp. fc2867*			
763.		*Genus fc2915 sp. fc2915*			
764.		*Genus fc2936 sp. fc2936*			Y
765.		*Genus fc2937 sp. fc2937*			Y
766.		*Genus fc2966 sp. fc2966*			Y
767.		*Genus fc2968 sp. fc2968*			
768.		*Genus fc2969 sp. fc2969*			Y
769.		*Genus fc2970 sp. fc2970*			
770.		*Genus fc2971 sp. fc2971*			Y
771.		*Genus fc2972 sp. fc2972*			Y
772.		*Genus fc303 sp. fc303*			
773.		*Genus fc3103 sp. fc3103*			
774.		*Genus fc3104 sp. fc3104*			Y
775.		*Genus fc3105 sp. fc3105*			Y
776.		*Genus fc312 sp. fc312*			
777.		*Genus fc313 sp. fc313*			
778.		*Genus fc315 sp. fc315*			Y
779.		*Genus fc316 sp. fc316*			
780.		*Genus fc317 sp. fc317*			
781.		*Genus fc318 sp. fc318*			
782.		*Genus fc32 sp. fc32*			
783.		*Genus fc323 sp. fc323*			
784.		*Genus fc324 sp. fc324*			
785.		*Genus fc326 sp. fc326*			
786.		*Genus fc33 sp. fc33*			
787.		*Genus fc333 sp. fc333*			
788.		*Genus fc339 sp. fc339*			
789.		*Genus fc342 sp. fc342*			
790.		*Genus fc345 sp. fc345*			
791.		*Genus fc356 sp. fc356*			
792.		*Genus fc360 sp. fc360*			
793.		*Genus fc362 sp. fc362*			
794.		*Genus fc366 sp. fc366*			
795.		*Genus fc374 sp. fc374*			
796.		*Genus fc376 sp. fc376*			
797.		*Genus fc38 sp. fc38*			
798.		*Genus fc380 sp. fc380*			
799.		*Genus fc382 sp. fc382*			
800.		*Genus fc386 sp. fc386*			
801.		*Genus fc389 sp. fc389*			
802.		*Genus fc391 sp. fc391*			
803.		*Genus fc392 sp. fc392*			
804.		*Genus fc394 sp. fc394*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
805.		*Genus fc395 sp. fc395*			
806.		*Genus fc396 sp. fc396*			
807.		*Genus fc397 sp. fc397*			
808.		*Genus fc405 sp. fc405*			
809.		*Genus fc407 sp. fc407*			
810.		*Genus fc41 sp. fc41*			
811.		*Genus fc410 sp. fc410*			
812.		*Genus fc411 sp. fc411*			
813.		*Genus fc412 sp. fc412*			
814.		*Genus fc414 sp. fc414*			
815.		*Genus fc417 sp. fc417*			
816.		*Genus fc419 sp. fc419*			
817.		*Genus fc420 sp. fc420*			
818.		*Genus fc421 sp. fc421*			
819.		*Genus fc422 sp. fc422*			
820.		*Genus fc424 sp. fc424*			
821.		*Genus fc425 sp. fc425*			
822.		*Genus fc428 sp. fc428*			
823.		*Genus fc430 sp. fc430*			
824.		*Genus fc431 sp. fc431*			
825.		*Genus fc434 sp. fc434*			
826.		*Genus fc436 sp. fc436*			
827.		*Genus fc438 sp. fc438*			
828.		*Genus fc439 sp. fc439*			
829.		*Genus fc441 sp. fc441*			
830.		*Genus fc443 sp. fc443*			
831.		*Genus fc454 sp. fc454*			
832.		*Genus fc459 sp. fc459*			
833.		*Genus fc460 sp. fc460*			
834.		*Genus fc466 sp. fc466*			
835.		*Genus fc467 sp. fc467*			
836.		*Genus fc469 sp. fc469*			
837.		*Genus fc47 sp. fc47*			
838.		*Genus fc473 sp. fc473*			
839.		*Genus fc475 sp. fc475*			
840.		*Genus fc48 sp. fc48*			
841.		*Genus fc484 sp. fc484*			
842.		*Genus fc492 sp. fc492*			
843.		*Genus fc494 sp. fc494*			
844.		*Genus fc495 sp. fc495*			
845.		*Genus fc498 sp. fc498*			
846.		*Genus fc50 sp. fc50*			
847.		*Genus fc512 sp. fc512*			
848.		*Genus fc513 sp. fc513*			
849.		*Genus fc514 sp. fc514*			
850.		*Genus fc515 sp. fc515*			Y
851.		*Genus fc516 sp. fc516*			
852.		*Genus fc517 sp. fc517*			Y
853.		*Genus fc521 sp. fc521*			
854.		*Genus fc523 sp. fc523*			
855.		*Genus fc529 sp. fc529*			
856.		*Genus fc532 sp. fc532*			
857.		*Genus fc538 sp. fc538*			
858.		*Genus fc54 sp. fc54*			
859.		*Genus fc544 sp. fc544*			
860.		*Genus fc549 sp. fc549*			
861.		*Genus fc564 sp. fc564*			
862.		*Genus fc566 sp. fc566*			
863.		*Genus fc568 sp. fc568*			
864.		*Genus fc579 sp. fc579*			
865.		*Genus fc587 sp. fc587*			
866.		*Genus fc597 sp. fc597*			
867.		*Genus fc6 sp. fc6*			
868.		*Genus fc60 sp. fc60*			
869.		*Genus fc608 sp. fc608*			
870.		*Genus fc618 sp. fc618*			
871.		*Genus fc62 sp. fc62*			
872.		*Genus fc623 sp. fc623*			Y
873.		*Genus fc628 sp. fc628*			
874.		*Genus fc63 sp. fc63*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
875.		*Genus fc636 sp. fc636*			
876.		*Genus fc638 sp. fc638*			
877.		*Genus fc64 sp. fc64*			
878.		*Genus fc641 sp. fc641*			
879.		*Genus fc646 sp. fc646*			
880.		*Genus fc648 sp. fc648*			
881.		*Genus fc649 sp. fc649*			
882.		*Genus fc65 sp. fc65*			
883.		*Genus fc652 sp. fc652*			
884.		*Genus fc655 sp. fc655*			
885.		*Genus fc656 sp. fc656*			
886.		*Genus fc657 sp. fc657*			
887.		*Genus fc658 sp. fc658*			
888.		*Genus fc66 sp. fc66*			
889.		*Genus fc661 sp. fc661*			
890.		*Genus fc669 sp. fc669*			
891.		*Genus fc67 sp. fc67*			
892.		*Genus fc670 sp. fc670*			
893.		*Genus fc675 sp. fc675*			
894.		*Genus fc678 sp. fc678*			
895.		*Genus fc68 sp. fc68*			
896.		*Genus fc680 sp. fc680*			
897.		*Genus fc683 sp. fc683*			
898.		*Genus fc691 sp. fc691*			
899.		*Genus fc693 sp. fc693*			
900.		*Genus fc694 sp. fc694*			
901.		*Genus fc699 sp. fc699*			
902.		*Genus fc714 sp. fc714*			
903.		*Genus fc715 sp. fc715*			
904.		*Genus fc719 sp. fc719*			
905.		*Genus fc72 sp. fc72*			
906.		*Genus fc73 sp. fc73*			
907.		*Genus fc75 sp. fc75*			
908.		*Genus fc750 sp. fc750*			
909.		*Genus fc753 sp. fc753*			
910.		*Genus fc755 sp. fc755*			
911.		*Genus fc757 sp. fc757*			
912.		*Genus fc758 sp. fc758*			
913.		*Genus fc76 sp. fc76*			
914.		*Genus fc766 sp. fc766*			
915.		*Genus fc77 sp. fc77*			
916.		*Genus fc770 sp. fc770*			
917.		*Genus fc771 sp. fc771*			
918.		*Genus fc776 sp. fc776*			
919.		*Genus fc784 sp. fc784*			
920.		*Genus fc785 sp. fc785*			
921.		*Genus fc787 sp. fc787*			
922.		*Genus fc80 sp. fc80*			
923.		*Genus fc801 sp. fc801*			
924.		*Genus fc806 sp. fc806*			
925.		*Genus fc82 sp. fc82*			
926.		*Genus fc83 sp. fc83*			
927.		*Genus fc833 sp. fc833*			
928.		*Genus fc842 sp. fc842*			
929.		*Genus fc85 sp. fc85*			
930.		*Genus fc853 sp. fc853*			
931.		*Genus fc855 sp. fc855*			
932.		*Genus fc857 sp. fc857*			
933.		*Genus fc86 sp. fc86*			
934.		*Genus fc861 sp. fc861*			
935.		*Genus fc862 sp. fc862*			
936.		*Genus fc863 sp. fc863*			
937.		*Genus fc864 sp. fc864*			
938.		*Genus fc88 sp. fc88*			
939.		*Genus fc880 sp. fc880*			
940.		*Genus fc896 sp. fc896*			
941.		*Genus fc90 sp. fc90*			
942.		*Genus fc900 sp. fc900*			
943.		*Genus fc901 sp. fc901*			
944.		*Genus fc907 sp. fc907*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
945.		*Genus fc919 sp. fc919*			
946.		*Genus fc92 sp. fc92*			
947.		*Genus fc921 sp. fc921*			
948.		*Genus fc947 sp. fc947*			
949.		*Genus fc948 sp. fc948*			
950.		*Genus fc95 sp. fc95*			
951.		*Genus fc957 sp. fc957*			
952.		*Genus fc96 sp. fc96*			
953.		*Genus fc960 sp. fc960*			
954.		*Genus fc962 sp. fc962*			
955.		*Genus fc969 sp. fc969*			
956.		*Genus fc986 sp. fc986*			
957.		*Genus fc989 sp. fc989*			
958.		*Genus fc996 sp. fc996*			
959.		*Geogarypus taylori*			
960.		*Gibbidessus sp.*			
961.		*Glossiphoniidae sp.*			
962.		*Gomphidae sp.*			
963.		*Goniaea opomaloides*			
964.		*Goniaea sp. fc1441*			
965.		*Goniaea sp. fc1470*			
966.		*Goniaea sp. fc1547*			
967.		*Goniaea sp. fc1984*			
968.		*Goniaea sp. fc2019*			
969.		*Goniaea sp. fc235*			
970.		*Goniaea sp. fc872*			
971.		*Goniaea vocans*			
972.		*Goniaoidea sp. fc1261*			
973.		*Gordiidae sp.*			
974.		*Gripopterygidae sp.*			
975.		*Gryllotalpa sp. fc1936*			Y
976.		*Gryllotalpa sp. fc2092*			Y
977.		*Gymnometriocnemus sp. 1 (=V44 = ortho sp. C & R)*			
978.		*Gymnometriocnemus spp. (not V44 or V45)*			
979.		*Gyrinidae sp.*			
980.		*Harrisius sp. A (SAP)*			
981.		*Harrisius sp. B (SFM)*			
982.		*Hebridae sp.*			
983.		*Hednota recurvella*			
984.		*Helea sp. fc1392*			
985.		*Heliomystis sp. fc663*			
986.		*Hellyethira malleoforma*			
987.		*Hellyethira sp.*			
988.		*Hemicordulia australiae*			
989.		*Hemicordulia tau*			
990.		*Hemicorduliidae sp.*			
991.		*Hesperocordulia berthoudi*			
992.		*Heteroceridae sp.*			
993.		*Heteronyx sp. fc1192*			
994.		*Heteronyx sp. fc1820*			
995.		*Heteronyx sp. fc1822*			
996.		*Heteronyx sp. fc1856*			
997.		*Heteronyx sp. fc1863*			
998.		*Heteronyx sp. fc1904*			
999.		*Heteronyx sp. fc1923*			
1000.		*Heteronyx sp. fc28*			
1001.		*Heteronyx sp. fc289*			
1002.		*Heteronyx sp. fc29*			
1003.		*Heteronyx sp. fc347*			
1004.		*Heteronyx sp. fc359*			
1005.		*Heteronyx sp. fc363*			
1006.		*Heteronyx sp. fc70*			
1007.		*Heteronyx sp. fc94*			
1008.		*Heteronyx sp. fc951*			
1009.		*Heurodes turritus*			
1010.		*Hirudinea sp.*			
1011.		*Hogna immansueta*			
1012.		*Hyderodes sp.*			
1013.		*Hydrachnidae sp.*			
1014.		*Hydraena sp.*			

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1015.		*Hydraenidae sp.*			
1016.		*Hydrobiidae sp.*			
1017.		*Hydrobiosella michaelseni*			
1018.		*Hydrobiosidae sp.*			
1019.		*Hydrochus sp.*			
1020.		*Hydrodromidae sp.*			
1021.		*Hydrometridae sp.*			
1022.		*Hydrophilidae sp.*			
1023.		*Hydrophilus triangulans*			
1024.		*Hydropsychidae sp.*			
1025.		*Hydroptila losida*			
1026.		*Hydroptilidae sp.*			
1027.		*Hydryphantidae sp.*			
1028.		*Hygrobia wattsi*			
1029.		*Hygrobiidae sp.*			
1030.		*Hyocephalus auprugnus*			
1031.		*Hypobapta barnardi*			
1032.		*Hypobapta sp. fc955*			
1033.		*Hyriidae sp.*			
1034.		*Ioannibates papillosus*			Y
1035.		*Isopeda leishmanni*			
1036.		*Janiridae sp.*			
1037.		*Karriella treenensis*			
1038.		*Kiefferulus intertinctus*			
1039.		*Kumbadjena occidentalis*			Y
1040.		*Lampona cylindrata*			
1041.		*Lancetes lanceolatus*			
1042.		*Latrodectus hasseltii*			
1043.		*Laxta sp. fc119*			
1044.		*Laxta sp. fc27*			
1045.		*Lectrides parilis*			
1046.		*Leptoc Genus A sp. AV1*			
1047.		*Leptoceridae sp.*			
1048.		*Leptoperla australica*			
1049.		*Leptoperla sp.1 (nsp)*			
1050.		*Leptophlebiid genus S sp. AV1*			
1051.		*Leptophlebiidae sp.*			
1052.		*Leptopius maleficus*			
1053.		*Lestidae sp.*			
1054.		*Libellulidae sp.*			
1055.		*Limbodessus inornatus*			
1056.		*Limbodessus shuckhardi*			
1057.		*Limnesiidae sp.*			
1058.		*Limnichidae sp.*			
1059.		*Limnophyes vestitus (V41)*			
1060.		*Limnoxenus sp.*			
1061.		*Limnoxenus zelandicus*			
1062.		*Liparetrus jenkinsi*			
1063.		*Lycidas michaelseni*			
1064.		*Lycosa godeffroyi*			
1065.		*Lymnaeidae sp.*			
1066.		*Lyncestis melanoschista*			
1067.		*Macrogyrus angustatus*			
1068.		*Macrogyrus australis*			Y
1069.		*Maechidius sp. fc287*			
1070.		*Maechidus sp. fc1189*			
1071.		*Maechidus sp. fc1388*			
1072.		*Maechidus sp. fc1871*			
1073.		*Mandalotus sp. fc2088*			
1074.		*Maratus pavonis*			
1075.		*Maydenoptila sp.*			
1076.		*Megaloptera sp.*			
1077.		*Megapodagrionidae sp.*			
1078.		*Melanotranes roei*			
1079.		*Melitidae sp.*			
1080.		*Melobasis vittatus*			Y
1081.		*Mesoveliidae sp.*			
1082.		*Metanastes sp. fc1945*			
1083.		*Metistete sp. fc340*			
1084.		*Metriolagria sp. fc192*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1085.		*Metriorrhynchus sp. fc1992*			Y
1086.		*Metriorrhynchus sp. fc2000*			
1087.		*Metriorrhynchus sp. fc208*			
1088.		*Metriorrhynchus sp. fc99*			
1089.		*Micronecta robusta*			
1090.		*Microvelia (Austromicrovelia) australiensis*			
1091.		*Microvelia (Pacificovelia) oceanica*			
1092.		*Microvelia sp.*			
1093.		*Mideopsidae sp.*			
1094.		*Miniargiolestes minimus*			
1095.		*Mituliodon tarantulinus*			
1096.		*Moerarchis clathrella*			
1097.		*Momoniidae sp.*			Y
1098.		*Muscidae sp.*			
1099.		*Myrmecia analis*			
1100.		*Myrmecia picticeps*			
1101.		*Myrmecia sp. fc1668*			
1102.		*Myrmecia sp. fc1880*			
1103.		*Myrmecia sp. fc1918*			Y
1104.		*Myrmecia sp. fc2011*			Y
1105.		*Myrmecia sp. fc2046*			
1106.		*Myrmecia sp. fc2691*			Y
1107.		*Myrmecia sp. fc2920*			
1108.		*Myrmecia sp. fc408*			
1109.		*Myrmecia sp. fc487*			
1110.		*Myrmecia sp. fc664*			
1111.		*Myrmecia sp. fc998*			
1112.		*Myrmecia vindex*			
1113.		*Naididae (ex Tubificidae)*			
1114.		*Naididae sp.*			
1115.		*Nanocladius sp.2 (V71)*			
1116.		*Nanometa gentilis*			
1117.		*Neboissophlebia occidentalis*			
1118.		*Necterosoma darwini*			
1119.		*Necterosoma sp.*			
1120.		*Nematoda sp.*			
1121.		*Neocarenum sp. fc2085*			
1122.		*Neolucia agricola*			
1123.		*Neoniphargidae sp.*			
1124.		*Neotemnopteryx sp. fc120*			
1125.		*Neotemnopteryx sp. fc591*			
1126.		*Nephila edulis*			
1127.		*Nerthra sp. fc2694*			
1128.		*Nesogaster sp. fc1113*			
1129.		*Nesogaster sp. fc1951*			
1130.		*Newmanoperla exigua*			
1131.		*Newmanoperla sp.*			
1132.		*Notalina nr. sp. AV14*			
1133.		*Notalina sp. AV15 (PSW)*			
1134.		*Notalina sp. AV16 (SFM)*			
1135.		*Notonectidae sp.*			
1136.		*Notonomus sp. fc746*			
1137.		*Notoperata sp. AV1 (SFM)*			
1138.		*Notoperata sp. AV4 (SFM)*			
1139.		*Notoperata tenax*			
1140.		*Nousia sp. AV16*			
1141.		*Nyungara bunni*			
1142.		*Ochrogaster sp. fc10*			
1143.		*Ochrogaster sp. fc7*			
1144.		*Ochterus occidentalis*			Y
1145.		*Ochthebius sp.*			
1146.		*Ocrisiona leucocomis*			
1147.		*Oecetis sp.*			
1148.		*Oectosis sp. fc711*			
1149.		*Oenochroma sp. fc31*			
1150.		*Oenochroma vinaria*			
1151.		*Oenosandra boisduvalii*			
1152.		*Offadens soror (ex genus 1 WA sp. 1)*			
1153.		*Oligochaeta sp.*			
1154.		*Omorgus sp. fc825*			

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1155.		*Oniscidae sp.*			
1156.		*Onosandrus sp. fc526*			
1157.		*Onthophagus ferox*			
1158.		*Ophion sp. fc87*			
1159.		*Opisthopora sp.*			
1160.		*Opodiphthera helena*			
1161.		*Oratemnus curtus*			
1162.		*Oribatida sp.*			
1163.		*Orthoclad sp. 5 (SFM)*			
1164.		*Orthocladiinae 'woodminer' (SAP)*			
1165.		*Orthocladiinae SO3 sp. A (SAP)*			
1166.		*Orthocladiinae sp.*			
1167.		*Ostracoda (unident.)*			
1168.		*Oxidae sp.*			
1169.		*Oxyethira sp.*			
1170.		*Oxyops fasciata*			
1171.		*Oxyops pictipennis*			
1172.		*Oxyops sp. fc462*			Y
1173.		*Ozarchaea harveyi*			
1174.		*Pachycondyla sp. fc737*			
1175.	33988	*Pachysaga munggai (cricket)*		P3	
1176.		*Pachysaga sp. fc688*			
1177.		*Palaemonidae sp.*			
1178.		*Pantydia sp. fc329*			
1179.		*Pantydia sp. fc388*			
1180.		*Pantydia sp. fc5*			
1181.		*Paracladopelma M1 [SFM)*			
1182.		*Paracymus pygmaeus*			
1183.		*Paracymus spenceri*			
1184.		*Parahyborrhynchus convexiuculus*			Y
1185.		*Parakiefferiella sp. S1*			
1186.		*Parakiefferiella variegatus*			
1187.		*Paralimnophyes pullulus (V42)*			
1188.		*Paramelitidae sp.*			
1189.		*Paramerina levidensis*			
1190.		*Paraoxypilus tasmaniensis*			
1191.		*Parastacidae sp.*			
1192.		*Paratanytarsus sp.*			
1193.		*Paropsis sp. fc2034*			
1194.		*Paropsis sp. fc667*			
1195.		*Paropsisterna sp. fc112*			
1196.		*Paropsisterna sp. fc463*			
1197.		*Paropsisterna sp. fc677*			
1198.		*Paropsisterna sp. fc786*			
1199.		*Paropsisterna sp. fc803*			
1200.		*Pelororhinus sp. fc1182*			
1201.		*Pentaneurini genus C*			
1202.		*Pentaneurini genus V20*			
1203.		*Pentasteron longiconductor*			
1204.		*Peripyra sanguinipucta*			
1205.		*Persectania ewingii*			
1206.		*Perthiidae sp.*			
1207.		*Phallaria ophiusaria*			
1208.		*Phenasteron longiconductor*			
1209.		*Philobota xanthastis*			Y
1210.		*Philophloeus eucalypti*			
1211.		*Philopotamidae sp.*			
1212.		*Philorheithridae sp.*			
1213.		*Pholcus phalangioides*			
1214.		*Pholodes sp. fc384*			
1215.		*Phreatoicidae sp.*			
1216.		*Phreodrilidae sp.*			
1217.		*Physidae sp.*			
1218.		*Planorbidae sp.*			
1219.		*Platycoris brunneus*			
1220.		*Platynectes aenescens*			
1221.		*Platynectes decempuntatus var polygrammus*			
1222.		*Platynectes sp.*			
1223.		*Platyzosteria sp. fc121*			
1224.		*Platyzosteria sp. fc122*			

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1225.		*Platyzosteria sp. fc1888*			
1226.		*Platyzosteria sp. fc1897*			
1227.		*Platyzosteria sp. fc2008*			Y
1228.		*Platyzosteria sp. fc2013*			Y
1229.		*Platyzosteria sp. fc2015*			
1230.		*Platyzosteria sp. fc2033*			Y
1231.		*Platyzosteria sp. fc507*			
1232.		*Platyzosteria sp. fc899*			
1233.		*Platyzosteria sp. fc971*			
1234.		*Pogonoscopus sp. fc503*			
1235.		*Polistes sp. fc2029*			
1236.		*Pollanisus cupreus*			
1237.		*Pollanisus sp. fc78*			
1238.		*Polypedilum nr. convexum (SAP)*			
1239.		*Polypedilum nubifer*			
1240.		*Polypedilum sp.*			
1241.		*Polypedilum watsoni*			
1242.		*Polyphrades aesalon*			
1243.		*Polyrhachis sp. fc1969*			Y
1244.		*Polyzosteria sp. fc2003*			
1245.		*Polyzosteria sp. fc2007*			Y
1246.		*Polyzosteria sp. fc592*			
1247.		*Porela sp. fc749*			
1248.		*Prasinocyma sp. fc393*			
1249.		*Prionosternum nitidiceps*			
1250.		*Procladius paludicola*			
1251.		*Proteuxoa pissonephra*			
1252.		*Psapharus inconspicuus*			
1253.		*Pseudaeolus sp. fc997*			
1254.		*Pseudotetralobus sp. fc2674*			Y
1255.		*Psychodidae sp.*			
1256.		*Ptomaphila sp. fc1656*			
1257.		*Pyralidae sp.*			
1258.		*Raveniella peckorum*			
1259.		*Rebilus sp. fc620*			
1260.		*Rebilus sp. fc938*			
1261.		*Rhadinosomus lacordaire*			
1262.		*Rhantus sp.*			
1263.		*Rhantus suturalis*			
1264.		*Rheotanytarsus flabellatus*			Y
1265.		*Rheotanytarsus juliae*			
1266.		*Rheotanytarsus sp.*			
1267.		*Rheotanytarsus sp. (SFM)*			
1268.		*Rheotanytarsus trivittatus*			
1269.		*Rheotanytarsus underwoodi*			
1270.		*Rhinaria aberrans*			
1271.		*Rhinaria sp. fc209*			
1272.		*Richardsonianidae sp.*			
1273.		*Riekoperla occidentalis*			
1274.		*Riethia v4*			
1275.		*Riethia v5*			
1276.		*Sandava scitisigna*			
1277.		*Scaraphites sp. fc2081*			Y
1278.		*Sciomyzidae sp.*			
1279.		*Scirtidae sp.*			
1280.		*Scitalini sp. fc1813*			
1281.		*Sclerorinus sp. fc1789*			
1282.		*Scolecobrotus sp. fc1041*			
1283.		*Servaea incana*			
1284.		*Sigara mullaka*			
1285.		*Sigara sp.*			
1286.		*Simuliidae sp.*			
1287.		*Skusella/"V12 ex-WA" (Cranston)*			
1288.		*Smicrophylax australis*			
1289.		*Sorama bicolor*			
1290.		*Sphaeriidae sp.*			
1291.		*Spongillidae sp.*			
1292.		*Staphylinidae sp.*			
1293.		*Stempellina sp. 1 (SFM)*			
1294.		*Sternopriscus browni*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1295.		*Sternopriscus marginatus*			
1296.		*Sternopriscus minimus*			
1297.		*Sternopriscus multimaculatus*			
1298.		*Sternopriscus sp.*			
1299.		*Sternopriscus wattsi*			Y
1300.		*Stibaroma melanotoxa*			
1301.		*Stictocladius occidentalis*			
1302.		*Storena sp. fc468*			
1303.		*Storosa tetrica*			
1304.		*Stratiomyidae sp.*			
1305.		*Styloniscidae sp.*			
1306.		*Supunna albopunctata*			
1307.		*Syndesus sp. fc1932*			
1308.		*Syndesus sp. fc437*			
1309.		*Synsphyronus magnus*			
1310.		*Synthemistidae sp.*			
1311.		*Syrphidae sp.*			
1312.		*Tabanidae sp.*			
1313.		*Talaurinus sp. fc817*			
1314.		*Talitridae sp.*			
1315.		*Tamopsis perthensis*			
1316.		*Tanypodinae sp.*			
1317.		*Tanytarsus aff edwardi*			
1318.		*Tanytarsus aff manleyensis*			
1319.		*Tanytarsus b1*			
1320.		*Tanytarsus fuscithorax/semibarbitarsus*			
1321.		*Tanytarsus nr K5*			
1322.		*Tanytarsus palmatus*			
1323.		*Tanytarsus sp.*			
1324.		*Tanytarsus sp. F (SAP)*			
1325.		*Tanytarsus sp. I (SAP)*			
1326.		*Tasmanicosa leuckartii*			
1327.		*Tasmanocoenis tillyardi*			
1328.		*Teia athlophora*			
1329.		*Teleogryllus commodus*			
1330.		*Telephlebiidae sp.*			
1331.		*Temnocephalidea sp.*			
1332.		*Thalamarchella alveola*			
1333.		*Thaumaleidae sp.*			
1334.		*Thienemanniella sp. (V19) (SAP)*			
1335.		*Tipulidae sp.*			
1336.	33995	*Trichosternus relictus (beetle)*		P1	
1337.		*Triplectides australis*			
1338.		*Triplectides sp. AV1 (SFM)*			
1339.		*Triplectides sp. AV21 (SFM)*			
1340.		*Trissodon sp. fc2084*			
1341.		*Trombidioidea sp.*			
1342.		*Turbellaria sp.*			
1343.		*Unionicolidae sp.*			
1344.		*Uraba lugens*			
1345.		*Uracanthus triangularis*			
1346.		*Uresiphita ornithopteralis*			
1347.		*Urodacus novaehollandiae*			
1348.		*Uvarus pictipes*			
1349.		*Veliidae sp.*			
1350.		*Venator immansueta*			
1351.		*Venatrix pullastra*			
1352.	34113	*Westralunio carteri (Carter's Freshwater Mussel)*		T	
1353.		*Westrarchaea pusilla*			
1354.		*Xanthorhoe sp. fc42*			
1355.		*Xanthorhoe sp. fc455*			
1356.		*Zygoptera sp.*			
1357.		*the dart sp. fc322*			
1358.		*unidentifiable unidentifiable*			

Mammal

1359.	25449	*Antechinus flavipes (Yellow-footed Antechinus)*			
1360.	24088	*Antechinus flavipes subsp. leucogaster (Yellow-footed Antechinus, Mardo)*			
1361.	24049	*Balaenoptera musculus subsp. intermedia (Antarctic Blue Whale)*		T	
1362.		*Balaenoptera sp.*			
1363.	24162	*Bettongia penicillata subsp. ogilbyi (Woylie, Brush-tailed Bettong)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
				T	
1364.	25454	*Canis lupus (Dog, Dingo)*	Y		
1365.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
1366.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
1367.	24187	*Chalinolobus morio (Chocolate Wattled Bat)*			
1368.	24092	*Dasyurus geoffroii (Chuditch, Western Quoll)*		T	
1369.	24189	*Falsistrellus mackenziei (Western False Pipistrelle)*		P4	
1370.	24215	*Hydromys chrysogaster (Water-rat)*		P4	
1371.	25478	*Isoodon obesulus (Southern Brown Bandicoot)*		P5	
1372.	24153	*Isoodon obesulus subsp. fusciventer (Quenda, Southern Brown Bandicoot)*		P5	
1373.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
1374.	24133	*Macropus irma (Western Brush Wallaby)*		P4	
1375.	24168	*Macrotis lagotis (Bilby, Dalgyte)*		T	
1376.	24078	*Mesoplodon grayi (Gray's Beaked Whale)*			
1377.	24184	*Mormopterus planiceps (Southern Freetail-bat)*			
1378.	24223	*Mus musculus (House Mouse)*	Y		
1379.	24146	*Myrmecobius fasciatus (Numbat, Walpurti)*		T	
1380.	24210	*Neophoca cinerea (Australian Sea Lion)*		S	
1381.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
1382.	24195	*Nyctophilus gouldi (Gould's Long-eared Bat)*			
1383.	24099	*Phascogale tapoatafa subsp. tapoatafa (Southern Brush-tailed Phascogale, Wambenger)*		T	
1384.	24166	*Pseudocheirus occidentalis (Western Ringtail Possum)*		T	
1385.	24243	*Rattus fuscipes (Western Bush Rat)*			
1386.	24245	*Rattus rattus (Black Rat)*	Y		
1387.	24145	*Setonix brachyurus (Quokka)*		T	
1388.	24111	*Sminthopsis gilberti (Gilbert's Dunnart)*			
1389.	25515	*Sminthopsis griseoventer (Grey-bellied Dunnart)*			
1390.	24259	*Sus scrofa (Pig)*	Y		
1391.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
1392.	24185	*Tadarida australis (White-striped Freetail-bat)*			
1393.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
1394.	24158	*Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)*			
1395.	24206	*Vespadelus regulus (Southern Forest Bat)*			
1396.	24040	*Vulpes vulpes (Red Fox)*	Y		
Reptile					
1397.	42368	*Acritoscincus trilineatus (Western Three-lined Skink)*			
1398.	24990	*Aprasia pulchella (Granite Worm-lizard)*			
1399.	43380	*Chelodina colliei (Oblong Turtle)*			
1400.	24980	*Christinus marmoratus (Marbled Gecko)*			
1401.	30893	*Cryptoblepharus buchananii*			
1402.	25031	*Ctenotus catenifer*			
1403.	25047	*Ctenotus impar*			
1404.	25049	*Ctenotus labillardieri*			
1405.	24995	*Delma australis*			
1406.	24939	*Diplodactylus polyophthalmus*			
1407.	25096	*Egernia kingii (King's Skink)*			
1408.	25100	*Egernia napoleonis*			
1409.	25250	*Elapognathus coronatus (Crowned Snake)*			
1410.	25290	*Elapognathus minor (Short-nosed Snake)*		P2	
1411.		*Geocrinia sp.*			
1412.	30919	*Hemiergis gracilipes*			
1413.	25475	*Hemiergis peronii*			
1414.	25117	*Hemiergis peronii subsp. peronii*			
1415.	25118	*Hemiergis peronii subsp. tridactyla*			
1416.	25131	*Lerista distinguenda*			
1417.	25133	*Lerista elegans*			
1418.	25154	*Lerista microtis subsp. microtis*			
1419.	41416	*Liopholis pulchra subsp. pulchra (South-western Rock Skink, Spectacled Rock Skink)*			
1420.	42413	*Lissolepis luctuosa (Western Swamp Skink)*			
1421.	25184	*Menetia greyii*			
1422.	25240	*Morelia spilota subsp. imbricata (Carpet Python)*		S	
1423.	25191	*Morethia lineoocellata*			
1424.	25192	*Morethia obscura*			
1425.	25252	*Notechis scutatus (Tiger Snake)*			
1426.	25255	*Parasuta nigriceps*			
1427.	25510	*Pogona minor (Dwarf Bearded Dragon)*			
1428.	25511	*Pseudonaja affinis (Dugite)*			
1429.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
1430.	30818	*Rhinoplocephalus bicolor (Square-nosed Snake)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1431.	25519	*Tiliqua rugosa*			
1432.	25206	*Tiliqua rugosa subsp. palarra*			
1433.	25207	*Tiliqua rugosa subsp. rugosa*			
1434.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
1435.	25225	*Varanus rosenbergi (Heath Monitor)*			

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

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

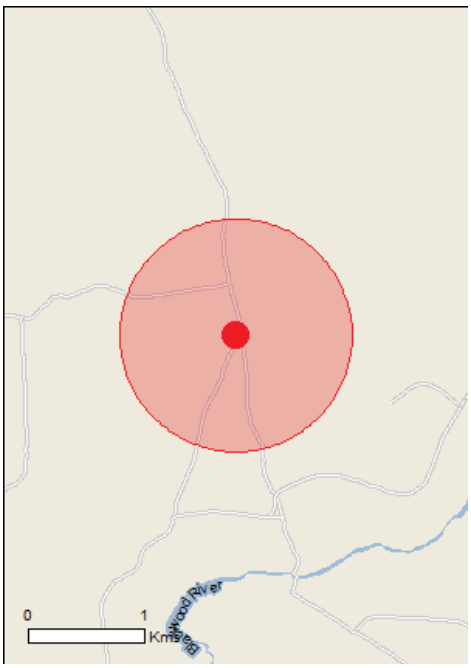
EPBC Act Protected Matters Report

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

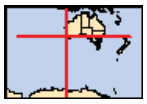
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 15/12/16 13:05:48



Coordinates
Buffer: 1.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	17
Listed Migratory Species:	6

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:	10
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	1
Invasive Species:	16
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		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area
Calyptorhynchus baudinii Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-Cockatoo [769]	Vulnerable	Breeding likely to occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Bettongia penicillata Brush-tailed Bettong, Woylie [213]	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
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Vulnerable	Species or species habitat may occur within area
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Banksia nivea subsp. uliginosa Swamp Honeypot [82766]	Endangered	Species or species habitat likely to occur within area
Banksia squarrosa subsp. argillacea Whicher Range Dryandra [82769]	Vulnerable	Species or species habitat likely to occur within area
Caladenia hoffmanii Hoffman's Spider-orchid [56719]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Caladenia winfieldii Majestic Spider-orchid [64504]	Endangered	Species or species habitat may occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
Gastrolobium papilio Butterfly-leaved Gastrolobium [78415]	Endangered	Species or species habitat may occur within area
Lambertia echinata subsp. occidentalis Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat may occur within area
Sphenotoma drummondii Mountain Paper-heath [21160]	Endangered	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

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		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

Regional Forest Agreements [Resource Information]

Note that all areas with 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 Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Mammals		

Name	Status	Type of Presence
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Asparagus scandens Asparagus Fern, Climbing Asparagus Fern [23255]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area

Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-34.02609 115.5983

Acknowledgements

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

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

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

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

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APPENDIX D

HABITAT TREE DETAILS

Habitat Trees (DBH ≥50cm)
Datum - GDA 94

Waypoint Number	Zone	mE	mN	Side of Road/Site	Tree Species	DBH (cm)	Tree Height (m)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt001	50H	370602	6234020	Tower Compound	Marri	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt002	50H	370595	6234025	Tower Compound	Marri	>50	20+	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollow/s unknown
wpt003	50H	370574	6234021	Tower Compound	Marri	>50	20+	2+	Small	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt004	50H	370584	6234032	Tower Compound	Marri	>50	20+	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollow/s unknown
wpt005	50H	370579	6234028	Tower Compound	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt006	50H	370560	6234019	Tower Compound	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt007	50H	370558	6234028	Tower Compound	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt008	50H	370550	6234025	Tower Compound	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt009	50H	370567	6234055	Tower Compound	Marri	>50	15-20	1	Large	No Signs	No Signs	No	Hollow appears to be too shallow
wpt010	50H	370567	6234053	Tower Compound	Jarrah	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt011	50H	370560	6234095	Tower Compound	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt012	50H	370562	6234089	Tower Compound	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt013	50H	370566	6234085	Tower Compound	Jarrah	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt014	50H	370559	6234104	Tower Compound	Marri	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt015	50H	370552	6234104	Tower Compound	Jarrah	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt016	50H	370580	6234089	Tower Compound	Jarrah	>50	20+	1	Small	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt017	50H	370589	6234089	Tower Compound	Marri	>50	20+	0		No Signs	No Signs	No	
wpt018	50H	370624	6234107	Tower Compound	Marri	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt019	50H	370626	6234100	Tower Compound	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt020	50H	370620	6234088	Tower Compound	Marri	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt021	50H	370616	6234092	Tower Compound	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt022	50H	370601	6234087	Tower Compound	Jarrah	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt023	50H	370598	6234079	Tower Compound	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt024	50H	370630	6234055	Tower Compound	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt025	50H	370628	6234055	Tower Compound	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt026	50H	370621	6234040	Tower Compound	Jarrah	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt027	50H	370636	6234033	Tower Compound	Jarrah	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt028	50H	370617	6234036	Tower Compound	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt029	50H	370606	6234039	Tower Compound	Jarrah	>50	20+	2+	Small-Large	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt030	50H	370611	6234049	Tower Compound	Marri	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt031	50H	370568	6234047	Tower Compound	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt032	50H	370589	6234066	Tower Compound	Jarrah	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt033	50H	370591	6234067	Tower Compound	Marri	>50	15-20	0		No Signs	No Signs	No	
wpt034	50H	370631	6234022	Tower Compound	Marri	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt035	50H	370630	6234010	West	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt036	50H	370627	6234001	West	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt037	50H	370623	6234013	West	Jarrah	>50	15-20	1	Large	No Signs	No Signs	No	Hollow appears to be too small
wpt038	50H	370626	6233996	West	Marri	>50	15-20	0		No Signs	No Signs	No	
wpt039	50H	370628	6233987	West	Jarrah	>50	20+	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollow/s unknown

Waypoint Number	Zone	mE	mN	Side of Road/Site	Tree Species	DBH (cm)	Tree Height (m)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt040	50H	370636	6233974	West	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt041	50H	370633	6233967	West	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt042	50H	370643	6233864	West	Marri	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt043	50H	370651	6233848	West	Marri	>50	15-20	0		No Signs	No Signs	No	
wpt044	50H	370651	6233829	West	Marri	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt045	50H	370645	6233810	West	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt046	50H	370655	6233800	West	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt047	50H	370654	6233798	West	Dead Marri	>50	15-20	0		No Signs	No Signs	No	
wpt048	50H	370650	6233790	West	Jarrah	>50	20+	2+	Small	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt049	50H	370662	6233774	West	Dead Jarrah	>50	20+	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollow/s unknown
wpt050	50H	370665	6233761	West	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt051	50H	370663	6233753	West	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt052	50H	370662	6233743	West	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt053	50H	370665	6233746	West	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt054	50H	370670	6233681	West	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt055	50H	370661	6233675	West	Marri	>50	15-20	0		No Signs	No Signs	No	
wpt056	50H	370654	6233663	West	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt057	50H	370680	6233634	West	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt058	50H	370661	6233602	West	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt059	50H	370664	6233595	West	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt061	50H	370670	6233541	West	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt062	50H	370665	6233530	West	Marri	>50	15-20	0		No Signs	No Signs	No	
wpt063	50H	370672	6233525	West	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt064	50H	370679	6233521	West	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt066	50H	370685	6233492	West	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt067	50H	370686	6233485	West	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt068	50H	370689	6233481	West	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt069	50H	370698	6233457	West	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt070	50H	370715	6233405	West	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt071	50H	370748	6233351	West	Marri	>50	20+	1	Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt072	50H	370790	6233290	West	Marri	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt073	50H	370787	6233252	West	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt074	50H	370783	6233246	West	Marri	>50	15-20	0		No Signs	No Signs	No	
wpt075	50H	370797	6233209	West	Jarrah	>50	20+	2+	Medium-Large (cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollow/s unknown
wpt076	50H	370797	6233184	East	Marri	>50	20+	0		No Signs	No Signs	No	
wpt077	50H	370802	6233189	East	Marri	>50	20+	0		No Signs	No Signs	No	
wpt078	50H	370800	6233212	East	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt079	50H	370796	6233235	East	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt080	50H	370804	6233261	East	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt081	50H	370799	6233266	East	Jarrah	>50	15-20	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollow/s unknown
wpt082	50H	370803	6233276	East	Jarrah	>50	20+	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollow/s unknown
wpt083	50H	370804	6233278	East	Jarrah	>50	15-20	1	Large	No Signs	No Signs	No	Hollow appears to be too low and shallow

Waypoint Number	Zone	mE	mN	Side of Road/Site	Tree Species	DBH (cm)	Tree Height (m)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt084	50H	370804	6233292	East	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt085	50H	370783	6233315	East	Jarrah	>50	10-15	2+	Medium-Large	No Signs	No Signs	No	Hollow appears to be too low and shallow
wpt086	50H	370773	6233320	East	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt087	50H	370778	6233331	East	Marri	>50	15-20	0		No Signs	No Signs	No	
wpt088	50H	370746	6233388	East	Marri	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt089	50H	370719	6233424	East	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt090	50H	370722	6233432	East	Marri	>50	15-20	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollow/s unknown
wpt091	50H	370704	6233462	East	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt092	50H	370704	6233489	East	Marri	>50	15-20	1	Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt093	50H	370686	6233512	East	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt094	50H	370676	6233540	East	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt095	50H	370687	6233552	East	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt096	50H	370683	6233565	East	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt097	50H	370675	6233587	East	Dead Unknown	>50	5-10	1	Large	No Signs	No Signs	No	Hollow appears to be too low and shallow
wpt098	50H	370683	6233591	East	Jarrah	>50	20+	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollow/s unknown
wpt099	50H	370678	6233600	East	Jarrah	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt100	50H	370675	6233618	East	Dead Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt101	50H	370673	6233632	East	Jarrah	>50	15-20	1	Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt102	50H	370681	6233703	East	Jarrah	>50	15-20	1	Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt103	50H	370676	6233710	East	Jarrah	>50	20+	0		No Signs	No Signs	No	
wpt104	50H	370672	6233714	East	Jarrah	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt105	50H	370678	6233732	East	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt106	50H	370680	6233754	East	Marri	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt107	50H	370673	6233752	East	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt108	50H	370669	6233766	East	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt109	50H	370667	6233765	East	Jarrah	>50	10-15	0		No Signs	No Signs	No	
wpt110	50H	370670	6233766	East	Dead Unknown	>50	15-20	0		No Signs	No Signs	No	
wpt111	50H	370666	6233834	East	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt112	50H	370669	6233830	East	Jarrah	>50	20+	2+	Small	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt113	50H	370661	6233846	East	Jarrah	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt114	50H	370666	6233856	East	Marri	>50	15-20	0		No Signs	No Signs	No	
wpt115	50H	370666	6233872	East	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt116	50H	370659	6233888	East	Dead Unknown	>50	15-20	0		No Signs	No Signs	No	
wpt117	50H	370650	6233914	East	Jarrah	>50	15-20	1	Small	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt118	50H	370656	6233914	East	Marri	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt119	50H	370644	6233935	East	Jarrah	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt120	50H	370645	6233941	East	Jarrah	>50	20+	2+	Small	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt121	50H	370642	6233969	East	Jarrah	>50	15-20	0		No Signs	No Signs	No	
wpt122	50H	370649	6233969	East	Jarrah	>50	20+	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollow/s unknown
wpt123	50H	370638	6233978	East	Jarrah	>50	20+	2+	Small-Medium	No Signs	No Signs	No	Internal dimensions of hollow/s unknown
wpt124	50H	370639	6233987	East	Jarrah	>50	20+	0		No Signs	No Signs	No	

APPENDIX E

SIGNIFICANT SPECIES PROFILES

Unnamed cricket *Pachysaga munggai*

Status and Distribution: Listed as Priority 3 by the DPaW. Distribution is poorly documented. NatureMap database contains only five records, the closest one being over 24km north of the subject site (DPaW 2016).

Habitat: Heathland habitat with occasional eucalypts and abundant leaf litter. Vegetation and leaf litter must be sufficient to provide this ground dwelling species with cover. Most NatureMap records are in the Jarrah forest belt.

Likely presence in subject site: Status in the subject site difficult to determine. The majority of the subject site appears unsuitable for this species as heathland and leaf litter are typically absent/sparse.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat is considered likely.

Unnamed Beetle *Trichosternus relictus*

Status and Distribution: Listed as Priority 1 by the DPaW. Distribution is poorly documented. NatureMap database contains only five records, the closest one being about 20km west of the subject site (DPaW 2016).

Habitat: Not documented.

Likely presence in subject site: Status in the subject site difficult to determine, however given the apparent scarcity of this species it is considered unlikely to persist within the area. Habitat with the subject site is widespread and common in the region suggesting it is unlikely to represent an area of any specific significance to the species.

Not considered a potential species based on currently available information.

Potential impact of development: Unknown, but significant impact on this species or its preferred habitat is considered very unlikely.

Carter's Freshwater Mussel *Westralunio carteri*

Status and Distribution: Listed as Schedule 3 under the *WC Act* and as Vulnerable (A2c) by the ICUN. Carter's freshwater mussel is the only freshwater mussel species endemic to south-western WA, ranging from the Moore River south to the Frankland River (Morgan *et al.* 2011).

Habitat: Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots. Salinity tolerance quite low (Morgan *et al*. 2011).

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Margaret River (Hairy) Marron *Cherax tenuimanus*

Status and Distribution: Listed as Scheduled 1 (Critically Endangered) under the *WC Act* and as Critically Endangered under the *EPBC Act*. The species is currently known from only eleven sites along a section of the Margaret River and occurs in an area less than 50 km in length.

Habitat: Information on the current distribution of the hairy marron indicates that the species requires relatively good quality water and a diversity of habitat structure (e.g. they generally prefer sandy areas, particularly where organic matter accumulates and access to shelter and refuge sites) and may struggle to persist in disturbed habitats.

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Margaret River Burrowing Crayfish *Engaewa pseudoreducta*

Status and Distribution: The Margaret River Burrowing Crayfish is listed in Schedule 1 under the *WC Act* and as Critically Endangered under the Commonwealth *EPBC Act*. The two sites where *E. pseudoreducta* have been collected are the headwater drainage swamp of one small southerly flowing tributary (<3km in length) of the Margaret River in its middle reaches.

Habitat: Habitat for the Margaret River burrowing crayfish is in the narrow creek tributaries of the Margaret River which are densely vegetated on heavy grey/yellow clay soils (Burnham *et al.* 2007). Associated vegetation includes tall tea-trees (*Melaleuca* sp.) and eucalypts (*Eucalyptus* spp.). In these soils, Margaret River burrowing crayfish construct a complex burrow system that can be several metres deep, extending down to the freshwater watertable in drier months. At wetter times of year burrows are marked by conspicuous chimneys of soil pellets.

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Western Mud Minnow *Galaxiella munda*

Status and Distribution: Listed as Scheduled 3 under the *WC Act*. Morgan *et al.* (1996) found during their survey of south west rivers that this species was "rare throughout most of its distribution, but occasionally abundant in the headwaters and tributaries of rivers and in a number of shallow pools connected to streams". In contrast Allen *et al.* (2003) states that this species is common in coastal drainages of south-western Australia between Albany and Margaret River, with an isolated population known from Gingin (Beatty 2010).

Habitat: 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) (Allen *et al.* 2003).

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Black-stripe Minnow *Galaxiella nigrostriata*

Status and Distribution: This species is classified as Priority 3 by DPaW. Allen *et al.* (2003) states that this species is common but restricted to wetlands within 100km of the coast in south Western Australia between Albany and Augusta with isolated populations known at Kemerton and Ellenbrook.

Habitat: Permanent or ephemeral pools, roadside ditches and small creeks in sandy, thickly vegetated wetland areas. Water is usually darkly tannin stained and acidic (pH 4.6 – 6.5) (Allen *et al* 2003). Where present, the black-striped minnow is widespread when water levels are high, but relies on a few summer refuge sites, where it survives in deep, cool pools and, when these dry out, retreats to water contained in the burrows of freshwater crayfish.

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur

Balston's Pygmy Perch *Nannatherina balstoni*

Status and Distribution: Listed as Scheduled 3 under the *WC Act* and as Vulnerable under the *EPBC Act*. Morgan *et al* (1996) states that this fish is the rarest of all the endemic fish of the south west. Status is defined as fairly secure by Allen *et al.* (2003) presumably given that, on the south coast, significant areas of habitat are within national parks. Confined to drainages and wetlands near the coast from between Margaret River and Two Peoples Bay.

Habitat: 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 (Allen *et al* 2003). Morgan (1996) found them most common in shallow pools and creeks that often dry up in summer. Lower numbers were observed in the permanent major rivers surveyed.

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Pouched Lamprey *Geotria australis*

Status and Distribution: Listed as Priority 1 by DPaW. Status is secure but abundance has decreased due to proliferation of obstacles to upstream spawning migration such as dams and weirs. Western Australian distribution includes coastal drainages of the south west from Perth to Albany (Allen *et al.* 2003).

Habitat: This species lives in mud burrows in the upper reaches of coastal streams for the first four years of life until migrating to the sea. Adults migrate up to 60km upstream during spawning (Allen *et al.* 2003).

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Orange Bellied Frog *Geocrinia vitellina*

Status and Distribution: Listed as Scheduled 3 under the *WC Act* and as Vulnerable under the *EPBC Act*. Only known from an area about 2km^2 (mostly along Spearwood Creek) on the north bank of the Blackwood River (Anstis 2013, Tyler & Doughty 2009).

Habitat: Most abundant at seepages on the slopes of Spearwood Creek (Tyler & Doughty 2009) where they are hidden in small excavated depressions in peaty soil beneath mats of vegetation (Anstis 2013).

Likely presence in subject site: Outside of documented range and no suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

White Bellied Frog *Geocrinia alba*

Status and Distribution: Listed as Scheduled 1 under the *WC Act (1950)* and as Critically Endangered under the *EPBC Act (1999)*. The species occur in riparian habitat in jarrah forest in the Karradale-Witchcliffe area in the far south-west corner of Western Australia. Recorded from 54 sites, 36 on privately-owned land, 15 at least partly within State forest or vacant Crown Land and three in National Parks. Of these 54 sites, frogs have disappeared from six since 1983. Agricultural clearing has reduced the probable original range of this species by about 70 percent (Wardell-Johnson *et al.* 1995).

Habitat: The White-bellied Frog has a total area of occupancy of about 193 ha in the Karradale-Witchcliffe area where it persists along creeklines within agricultural landscapes, provided suitable riparian habitat remains intact. All sites are within one of three land units described by Tille and Lantzke (1990). The Wvw (Wilyabrub Wet Valleys, 4 sites) and Hvw (Glengarty Wet Valleys 39 sites) land units are characterised by broad U-shaped drainage depressions with swampy floors in land systems of subdued topography on Leeuwin Block granite. The Tv land unit (Treeton Valleys, 11 sites) occurs in narrow V shaped valleys on laterized Perth Basin sediments. The area of suitable habitat of the White-bellied Frog was estimated, in 1986, to be 193.2 ha or approximately three percent of the species extent of occurrence. However this may be an overestimate, as not all potential sites support populations of the White-bellied Frog. Undisturbed sites in these three land units also extend beyond the range of White-bellied Frog (Wardell-Johnson *et al.* 1995).

Likely presence in subject site: Outside of documented range and no suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Nornalup (Walpole) Frog Geocrinia lutea

Status and Distribution: This species is classified as Priority 4 by DPaW. Known only from a small area around Walpole to Nornalup (Tyler & Doherty 2009) north to Mount Frankland (Anstis 2013).

Habitat: This species is associated with karri (*Eucalyptus diversicolor*) forest where they occur in seepage areas beside small creeks and swampy areas. Breeding sites include sphagnum moss or peat based mud depression beneath clumps of vegetation beside creeks (Anstis 2013).

Likely presence in subject site: Outside of documented range and no suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Short-nosed Snake *Elapognathus minor*

Status and Distribution: Listed as Priority 2 by DPaW. Found north to Busselton and east to Two Peoples Bay (Storr *et al.* 2002).

Habitat: Restricted to the humid coastal plains of the deep south west (Storr *et al.* 2002). Inhabits heaths edging swamps though also known to inhabit wet sclerophyll forest. Shelters in low dense vegetation such as tussocks and sedges (Wilson and Swan 2013).

Likely presence in subject site: Habitat appears unsuitable or at best marginal.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Malleefowl *Leipoa ocellata*

Status and Distribution: This species is listed as Schedule 3 under the *WC Act* and as Vulnerable under the *EPBC Act (1999)*. Originally common, but now generally rare to uncommon and patchily distributed.

Current distribution mainly southern arid and semi-arid zones, north to Shark Bay, Jingemarra, Colga Downs and Yeelirrie, east to Earnest Giles Range, Yeo Lake, lower Ponton Creek and to Eucla and west and south to Cockleshell Gully, the Wongan Hills, Stirling Range, Beaufort Inlet, Hatters Hill, Mt Ragged and Point Malcolm (Johnstone and Storr 1998).

Habitat: Mainly scrubs and thickets of mallee *Eucalyptus* spp., boree *Melaleuca lanceolata* and bowgada *Acacia linophylla*, also dense litter forming shrublands.

Likely presence in subject site: This species is regionally extinct and would never, under normal circumstances occur in this area.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species will occur as it is unlikely to be present.

Eastern Great Egret *Ardea alba/Ardea modesta*

Status and Distribution: This species is listed as Schedule 5 under the *WC Act* and as Migratory under the *EPBC Act* and under international agreements to which Australia is a signatory. The great egret is common and very widespread in any suitable permanent or temporary habitat (Morcombe 2004).

Habitat: Wetlands, flooded pasture, dams, estuarine mudflats, mangroves and reefs (Morcombe 2004).

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Cattle Egret *Ardea ibis*

Status and Distribution: This species is listed as Schedule 3 under the *WC Act* and as Migratory under the *EPBC Act* and under international agreements to which Australia is a signatory. The cattle egret is common in the north sections of its range but is an irregular visitor to the better watered parts of the state (Johnstone and Storr 1998). The population is expanding (Morcombe 2004).

Habitat: Moist pastures with tall grasses, shallow open wetlands and margins, mudflats (Morcombe 2004).

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Osprey *Pandion haliaetus*

Status and Distribution: This species is listed as Schedule 3 under the *WC Act* and as Marine/Migratory under the *EPBC Act* and under international agreements to which Australia is a signatory. Moderately common to very common in sheltered seas around the north and west coast islands south to 31°S; uncommon to common on mainland coasts, estuaries and large rivers north of tropic, rare to uncommon elsewhere (Johnstone and Storr 1998).

Habitat: Coasts, estuaries, bays, inlets, islands, and surrounding waters, coral atolls, reefs, lagoons, rock cliffs and stacks. Ascends larger rivers (Pizzey & Knight 2012). Construct nests on prominent headland, large trees communication towers (Simpson and Day 2010).

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

White-bellied Sea Eagle *Haliaeetus leucogaster*

Status and Distribution: This species is listed as Marine under the *EPBC Act* and as Migratory under international agreements to which Australia is a signatory. White-bellied sea eagles are moderately common to common on Kimberley and Pilbara islands, coasts and estuaries, on Bernier, Dorre and Dirk Hartog Is., in Houtman Abrolhos and in the Archipelago of the Recherche; rare to uncommon elsewhere (Johnstone and Storr 1998). Also found in New Guinea, Indonesia, China, southeast Asia and India. Scarce near major coastal cities (Morcombe 2004).

Habitat: Sea eagles usually nest and forage near the coast over islands, reefs, headlands, beaches, bays, estuaries, mangroves, but will also live near seasonally flooded inland swamps, lagoons and floodplains, often far inland on large pools of major rivers. Established pairs usually sedentary, immatures dispersive (Morcombe 2004). White-bellied sea-eagles build a large stick nest, which is used for many seasons in succession.

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Peregrine Falcon *Falco peregrinus*

Status and Distribution: This species is listed as Schedule 7 under the *WC Act*. Individuals of this species are uncommon/rare but wide ranging across Australia. Moderately common at higher levels of the Stirling Range, uncommon in hilly, north west Kimberley, Hamersley and Darling Ranges; rare or scarce elsewhere (Johnstone and Storr 1998).

Habitat: Diverse from rainforest to arid shrublands, from coastal heath to alpine (Morcombe 2004). Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes (Johnstone and Storr 1998). The species utilises the ledges, cliff faces and large hollows/broken spouts of trees for nesting. It will also occasionally use the abandoned nests of other birds of prey.

Likely presence in subject site: Individuals of this species potentially utilise some sections of the subject site as part of a much larger home range but under these circumstance they would only occur rarely. Some potential for nesting in large open tree spouts, though no evidence of this observed during the field survey.

Listed as a potential species based on available information.

Potential impact of development: Potential for localised modification/loss of very small areas of possible habitat, but no significant impact considered likely.

Glossy Ibis *Plegadis falcinellus*

Status and Distribution: This species is listed as Schedule 5 under the *WC Act,* as Migratory under the *EPBC Act* and under international agreements to which Australia is a signatory. The glossy ibis frequents swamps and lakes throughout much of the Australian mainland, but is most numerous in the north. It is a non-breeding visitor to Tasmania and the south-west of Western Australia. The glossy ibis is both migratory and nomadic. Its range expands inland after good rains, but its main breeding areas seem to be in the Murray-Darling Basin of New South Wales and Victoria, the Macquarie Marshes in New South Wales, and in southern Queensland. Glossy ibis often move north in autumn, then return south to their main breeding areas in spring and summer (Pizzey & Knight 2012).

Habitat: Well vegetated wetlands, wet pastures, rice fields, floodwaters, floodplains, brackish or occasionally saline wetlands, mangroves, mudflats, occasionally dry grasslands (Pizzey & Knight 2012).

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Blue-billed Duck *Oxyura australis*

Status and Distribution: Recently listed as Priority 4 by DPaW (DPaW 2015). Rare to moderately common (most plentiful on the Swan Coastal Plain and in the Great Southern). South-western: north to Lake Pinjarrega and east to Esperance; vagrant further north and east (as far as Thundelarra and Kalgoorlie). Also south-eastern Australian and Tasmania (Johnstone and Storr 1998).

Habitat: Well vegetated freshwater swamps, large dams and lakes (Pizzey and Knight 2012), winters on more open water (Morcombe 2014). Occasionally salt lakes and estuaries freshened by floodwaters (Johnstone and Storr 1998).

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Other Migratory/Marine Shorebirds/Wetland/Seabird Species

A number of migratory/marine shorebirds/wetland/seabird species were listed in database searches as potentially occurring in the general area. Specific species are not discussed.

Status and Distribution: Most migratory shorebirds/wetland/seabird species are listed under the Schedule 5 of the *WC Act*, the *EPBC Act* and under international agreements to which Australia is a signatory. All species are either widespread summer migrants to Australia or residents. State and Federal conservation status varies between species.

Habitat: Varies between species but includes 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.

Likely presence in subject site: No suitable habitat.

None considered potential species based on currently available information.

Potential impact of development: No impact on these species or their preferred habitat will occur.

Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*

Status and Distribution: Listed as Scheduled 3 under the *WC Act* and as Vulnerable under the *EPBC Act*. Found in the humid and subhumid south west, mainly hilly interior, north to Gingin and east to Mt Helena, Christmas Tree Well, North Bannister, Mt Saddleback, Rock Gully and the upper King River (Johnstone and Storr 1998).

Habitat: Eucalypt forests, feeds on marri, jarrah, blackbutt, karri, sheoak and snottygobble. The forest red-tailed black cockatoo nests in the large hollows of marri, jarrah and karri (Johnstone and Kirkby 1999). In marri, the nest hollows of the forest red-tailed black cockatoo range from 8-14m above ground, the entrance is 12 – 41cm in diameter and the depth is one to five metres (Johnstone and Storr 1998).

Breeding commences in winter/spring. There are few records of breeding in the forest red-tailed black cockatoo (Johnstone and Storr 1998), but eggs are laid in October and November (Johnstone 1997; Johnstone and Storr 1998). Recent data however indicates that breeding in all months of the year occurs with peaks in spring and autumn–winter (Ron Johnstone pers comms). Incubation period 29 – 31 days. Young fledge at 8 to 9 weeks (Simpson and Day 2010).

Likely presence within the subject site: Several individuals and foraging evidence attributed to this species were observed during the survey period (e.g. chewed marri fruits). Most of the remnant vegetation within the subject site represents foraging habitat. No evidence of actual breeding taking place was observed however all larger trees (≥50cm DBH) can be considered “breeding habitat” (as defined by DotEE – SEWPaC 2012), a number of which appear to contain large hollows. No roosting sites identified.

Listed as a potential species based on available information.

Potential impact of development: Potential for localised loss of areas of habitat, though given the small area involved and the large expanses of similar adjoining habitat, "significant impact" is considered unlikely.

Baudin's Black-Cockatoo *Calyptorhynchus baudinii*

Status and Distribution: Listed as Scheduled 2 under the *WC Act* and as Vulnerable under the *EPBC Act*. Confined to the south-west of Western Australia, north to Gidgegannup, east to Mt Helena, Wandering, Quindanning, Kojonup, Frankland and King River and west to the eastern strip of the Swan Coastal Plain including West Midland, Byford, Nth Dandalup, Yarloop, Wokalup and Bunbury (Johnstone and Storr 1998). On the southern Swan Coastal Plain this cockatoo is in some areas resident but mainly a migrant moving from the deep south-west to the central and northern Darling Range. Between March and September most flocks move north and are concentrated in the northern parts of the Darling Range. During this period birds forage well out onto the southern Swan Coastal Plain to areas such as Harvey, Myalup, Bunbury, Capel, Dunsborough and Meelup. While generally more common in the Darling Range this species can also be common on parts of the southern Swan Coastal Plain especially in mid-August – September when flocks begin to return to their breeding quarters (Johnstone 2008).

Habitat: Mainly eucalypt forests where it feeds primarily on the marri seeds, (Morcombe 2004), *Banksia*, *Hakea* and *Erodium* sp. Also strips bark from trees in search of beetle larvae (Johnstone and Storr 1998). This species of cockatoo nests in large tree hollows, 30–40 cm in diameter and more than 30 cm deep (Saunders 1974).

Baudin's Black-Cockatoo breeds in late winter and spring, from August to November or December (Gould 1972; Johnstone 1997; Saunders 1974; Saunders *et al.* 1985). Eggs laid in October (Johnstone and Storr 1998). Based on observations at currently known nest sites breeding mainly occurs within the October-December period (Ron Johnstone pers comms). Incubation is 28 – 30 days. Young fledge at 8 to 9 weeks (Simpson and Day 2010).

Likely presence within the subject site: Foraging evidence attributed to this species was observed during the survey period (e.g. chewed marri fruits). Most of the remnant vegetation within the subject site represents foraging habitat. No evidence of actual breeding taking place was observed however all larger trees (≥50cm DBH) can be considered "breeding habitat" (as defined by DotEE – SEWPaC 2012), a number of which appear to contain large hollows. No roosting sites identified.

Listed as a potential species based on available information.

Potential impact of development: Potential for localised loss of areas of habitat, though given the small area involved and the large expanses of similar adjoining habitat, "significant impact" is considered unlikely.

Carnaby's Black-Cockatoo *Calyptorhynchus latirostris*

Status and Distribution: Carnaby's Black Cockatoo is listed as Scheduled 2 under the *WC Act* and as Endangered under the *EPBC Act*. Confined to the south-west of Western Australia, north to the lower Murchison River and east to Nabawa, Wilroy, Waddi Forest, Nugadong, Manmanning, Durokoppin, Noongar (Moorine Rock), Lake Cronin, Ravensthorpe Range, head of Oldfield River, 20 km ESE of Condingup and Cape Arid; also casual on Rottnest Island (Johnstone and Storr 1998).

Habitat: Forests, woodlands, heathlands, farms; feeds on *Banksia*, *Hakea* and Marri. Carnaby's Cockatoo has specific nesting site requirements. Nests are mostly in smoothed-barked eucalypts with the nest hollows ranging from 2.5 to 12m above the ground, an entrance from 23-30cm diameter and a depth of 0.1-2.5m (Johnstone and Storr, 1998).

Breeding occurs in winter/spring mainly in eastern forest and wheatbelt where they can find mature hollow bearing trees to nest in (Morcombe 2004). Judging from records in the Storr-Johnstone Bird Data Bank, this species is currently expanding its breeding range westward and south into the Jarrah – Marri forest of the Darling Scarp and into the Tuart forests of the Swan Coastal Plain including the region between Mandurah and Bunbury. Carnaby's Black Cockatoo has been known to breed close to the town of Mandurah, as well as at Dawesville, Lake Clifton and Baldivis (pers. comm., Ron Johnstone, WA Museum) and there are small resident populations on the southern Swan Coastal Plain near Mandurah, Lake Clifton and near Bunbury. At each of these sites the birds forage in remnant vegetation and adjacent pine plantations (Johnstone 2008).

Carnaby's Black-Cockatoo lays eggs from July or August to October or November, with most clutches being laid in August and September (Saunders 1986). Birds in inland regions may begin laying up to three weeks earlier than those in coastal areas (Saunders 1977). The female incubates the eggs over a period of 28-29 days. The young depart the nest 10–12 weeks after hatching (Saunders 1977; Smith & Saunders 1986).

Likely presence within the subject site: Foraging evidence attributed to this species was observed during the survey period (e.g. chewed marri fruits). Most of the remnant vegetation within the subject site represents foraging habitat. No evidence of actual breeding taking place was observed however all larger trees (≥50cm DBH) can be considered "breeding habitat" (as defined by DotEE – SEWPaC 2012), a number of which appear to contain large hollows. No roosting sites identified.

Listed as a potential species based on available information.

Potential impact of development: Potential for localised loss of areas of habitat, though given the small area involved and the large expanses of similar adjoining habitat, "significant impact" is considered unlikely.

Masked Owl *Tyto novaehollandae novaehollandae*

Status and Distribution: Listed as Priority 3 by DPaW. Found north to Yanchep and east to Yealering, Gnowangerup and Albany, casual further north. Locally common in south west but generally uncommon (Johnstone and Storr 1998).

Habitat: Roosts and nests in heavy forest, hunts over open woodlands and farmlands (Morcombe 2004). Probably breeding in forested deep south west with some autumn–winter wanderings northwards (Johnstone and Storr 1998).

Likely presence in subject site: Status in the general area is difficult to determine. May utilise forest and woodland areas within and near the subject site for roosting. Probably only present rarely.

Listed as a potential species based on available information.

Potential impact of development: Potential for localised loss/modification of very small areas of possible habitat, but no significant impact considered likely.

Fork-tailed Swift *Apus pacificus*

Status and Distribution: The fork-tailed swift is listed as Schedule 5 under the *WC Act* and as Migratory under the *EPBC Act* as migratory under the *EPBC Act 1999* and under international agreements to which Australia is a signatory. It is a summer migrant (Oct-Apr) to Australia (Morcombe 2004).

Habitat: Low to very high airspace over varied habitat from rainforest to semi desert (Morcombe 2004).

Likely presence in subject site: Very uncommon in south west and rarely utilises terrestrial habitats (i.e. almost entirely aerial). May occur very occasionally.

Not listed as a potential species based on available information.

Potential impact of development: No impact on this species or its preferred habitat is will occur.

Rainbow Bee-eater *Merops ornatus*

Status and Distribution: This species is listed as Schedule 5 under the *WC Act* and as migratory under the *EPBC Act* and under international agreements to which Australia is a signatory. The Rainbow Bee-eater is a common summer migrant to southern Australia but in the north they are resident (Morcombe 2004).

Habitat: Open Country, of woodlands, open forest, semi arid scrub, grasslands, clearings in heavier forest, farmlands (Morcombe 2004). Breeds underground in areas of suitable soft soil firm enough to support tunnel building.

Likely presence in subject site: This species is a common seasonal visitor to south west and therefore is likely to occur in small numbers during spring/summer migration periods. Ground conditions appear unsuitable for breeding.

Listed as a potential species based on available information.

Potential impact of development: Potential for localised loss/modification of very small areas of possible habitat, but no significant impact considered likely.

Grey Wagtail *Motacilla cinerea*

Status and Distribution: The grey wagtail is listed as Schedule 5 under the *WC Act* and as Migratory under the *EPBC Act* including international agreements to which Australia is a signatory. A rarely recorded, accidental vagrant that has on a few occasions been recorded on widely separated parts of the Australian coastline (Pizzey & Knight 2012).

Habitat: In Australia, near running water in disused quarries, sandy, rocky streams in escarpments and rainforest, sewerage ponds, ploughed fields and airfields (Pizzey & Knight 2012).

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Chuditch *Dasyurus geoffroii*

Status and Distribution: Listed as Scheduled 3 under the *WC Act* and as Vulnerable under the *EPBC Act.* Formerly occurred over nearly 70 per cent of Australia. The chuditch now has a patchy distribution throughout the Jarrah forest and mixed karri/marri/jarrah forest of southwest Western Australia. Also occurs in very low numbers in the Midwest, Wheatbelt and South Coast Regions with records from Moora to the north, Yellowdine to the east and south to Hopetoun (DEC 2012).

Habitat: Chuditch use a range of habitats including forest, mallee shrublands, woodland and desert. The densest populations have been found in riparian jarrah forest. Chuditch require adequate numbers of suitable den and refuge sites (horizontal hollow logs or earth burrows) and sufficient prey biomass (large invertebrates, reptiles and small mammals) to survive. They are capable of travelling long distances and have large home ranges, and even at their most abundant, chuditch are generally present in low numbers. For this reason, they require habitats that are of a suitable size and not excessively fragmented (DPaW 2012). The estimated home range of a male chuditch is over 15 km^2 whilst that for females is 3-4 km^2 (Sorena and Soderquist 1995).

Likely presence in subject site: While there are no records in NatureMap (2016) for this specific area, there are numerous records nearby and it therefore may occur.

However, given the species preference for a large home range and the subject sites small size the habitat onsite is only likely at best to make up a very small proportion of the home ranges of no more than a few individuals.

Listed as a potential species based on available information.

Potential impact of development: Loss/modification of very small areas of potential habitat but impacts are unlikely to alter the species overall status in the wider area given the huge extent of similar habitat nearby, much of which is in national parks.

Southern Brush-tailed Phascogale *Phascogale tapoatafa ssp.*

Status and Distribution: Listed as Scheduled 3 under the *WC Act*. Present distribution is believed to have been reduced to approximately 50 per cent of its former range. Now known from Perth and south to Albany, west of Albany Highway. Occurs at low densities in the northern jarrah forest. Highest densities occur in the Perup/Kingston area, Collie River valley, and near Margaret River and Busselton (DPaW information pamphlet). Records are less common from wetter forests.

Habitat: This subspecies has been observed in dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover. A nocturnal carnivore relying on tree hollows as nest sites. The home range for a female Brush-tailed Phascogale is estimated at between 20 and 70 ha, whilst that for males is given as twice that of females. In addition, they tend to utilise a large number (approximately 20) of different nest sites throughout their range (Soderquist 1995).

Likely presence in subject site: While there are no records in NatureMap (2016) for this specific area, it is highly likely that this species occurs in the general area.

Listed as a potential species based on available information.

Potential impact of development: Loss/modification of very small areas of potential habitat but impacts are unlikely to alter the species overall status in the wider area given the huge extent of similar habitat nearby, much of which is in national parks.

Numbat *Myrmecobius fasciatus*

Status and Distribution: Listed as Scheduled 3 under the *WC Act* and as Vulnerable under the *EPBC Act*. Once occurred across much of arid and semi arid southern Australia, now restricted to a few remnant forests of wandoo, powderbark wandoo or jarrah in South west WA (Menkhorst & Knight 2011). Rare, scattered. Found only at Dryandra, Perup and six other translocation sites (Van Dyck & Strahan 2008).

Habitat: Generally dominated by eucalypts that provide hollow logs and branches for shelter and termites for food (Van Dyck & Strahan 2008).

Likely presence in subject site: This species is locally and regionally extinct.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Bilby *Macrotis lagotis*

Status and Distribution: The bilby is listed as Schedule 3 under the *WC Act* and as Vulnerable under the *EPBC Act*. Current distribution in suitable habitat from Tanami Desert west to near Broome and south to Warburton. Former distribution extended south to Margaret River, though apparently absent from coastal plain (Burbidge 2004).

Habitat: Current habitat included Acacia shrublands, spinifex and hummock grassland (Menkhorst *et al.* 2011).

Likely presence in subject site: Regionally extinct.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Southern Brown Bandicoot (Quenda) *Isoodon obesulus fusciventer*

Status and Distribution: Listed as Priority 4 by DPaW. Widely distributed in the south west from near Cervantes north of Perth to east of Esperance, patchy distribution through the jarrah and karri forest and on the Swan Coastal Plain, and inland as far as Hyden. Has been translocated to Julimar State Forest, Hills Forest Mundaring, Tutanning Nature Reserve, Boyagin Nature Reserve, Dongolocking Nature Reserve, Leschenault Conservation Park, and Karakamia and Paruna Sanctuaries and Nambung National Park (DPaW information pamphlet).

Habitat: Dense scrubby, often swampy, vegetation with dense cover up to one metre high, often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover. Populations inhabiting jarrah and wandoo forests are usually associated with watercourses. Quendas can thrive in more open habitat subject to exotic predator control (DPaW information pamphlet).

Likely presence in subject site: Status onsite difficult to determine as no evidence of its presence seen and NatureMap (DPaW 2016) shows only sparse records for the general area, however given the presence of some suitable dense vegetation this species is make occur at some locations within the subject site.

Listed as a potential species based on available information.

Potential impact of development: Loss of small areas of potential habitat but impacts are unlikely to alter the species overall status in the wider area given the huge extent of similar habitat nearby, much of which is in national parks.

Western Ringtail Possum *Pseudocheirus occidentalis*

Status and Distribution: Listed as Scheduled 2 under the *WC Act* and as Vulnerable under the *EPBC Act.* Common in suitable habitat (de Tores 2008). The highest densities of this species are recorded in peppermint habitat near Busselton area; relatively high densities are found in jarrah/marri forest at Perup (de Tores 2008).

The western ringtail possum has a restricted distribution in south-western Western Australia. Most known populations (natural and translocated) are now restricted to near coastal areas of the south west from the Dawesville area to the Waychinicup National Park. Inland, it is also known to be relatively common in a small part of the lower Collie River valley, the Perup Nature Reserve and surrounding forest blocks near Manjimup.

The western ringtail was formerly more widespread: in the 1970s it was known from *Casuarina* woodlands in the wheatbelt near Pingelly (south-east of Perth), and it is thought to have once occurred throughout much of south-western Western Australia (but not necessarily continuously distributed) (Maxwell *et al.* 1996; de Tores 2008).

The species is widespread and relatively common in vegetated remnants within the Swan Coastal Plain and along the Whicher Scarp between Bunbury and Busselton (G. Harewood per. obs.).

Habitat: The western ringtail possum was once located in a variety of habitats including coastal peppermint, coastal peppermint-tuart, jarrah-marri associations, sheoak woodland, and eucalypt woodland and mallee. Coastal populations mostly inhabit peppermint-tuart associations with highest densities in habitats with dense, relatively lush vegetation. In these areas the main determinants of suitable habitat for WRPs appears to be the presence of *Agonis flexuosa* either as the dominant tree or as an understorey component of Eucalypt forest or woodland (Jones *et al.* 1994).

Inland, the largest known populations occur in the Upper Warren area east of Manjimup (Wayne *et al.* 2005). In this area the peppermint tree is naturally absent and jarrah-marri associations constitute the species refuge and foraging habitat. In these areas, where peppermint is scarce or absent, the species appears to primarily feed on *Nuytsia floribunda*, sheoak (*Allocasuarina fraseriana*), young jarrah and marri (including young shoots, flowers and ripening fruits)(G. Harewood per. obs.). This species also utilises pine forests but to what degree is unknown (G. Harewood per. obs.).

WRPs utilises tree hollows when present and available but also builds “dreys” for daytime refuge where vegetation structure permits.

Likely presence in subject site: The current status in the area is uncertain. No evidence of this species was observed during the field survey and NatureMap (DPaW 2016) shows only very sparse records for the general area.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat is considered likely.

Quokka *Setonix brachyurus*

Status and Distribution: Listed as Scheduled 3 under the *WC Act* and as Vulnerable under the *EPBC Act*. Rare and restricted in south west W.A. from south of Perth to Two Peoples Bay. The distribution of the Quokka includes Rottnest and Bald Islands, and at least 25 known sites on the mainland, including Two Peoples Bay Nature Reserve, Torndirrup National Park, Mt Manypeaks National Park, Walpole-Nornalup National Park, and various swamp areas through the south-west forests from Jarrahdale to Walpole.

Habitat: Mainland populations of this species are currently restricted to densely vegetated coastal heaths, swamps, riverine habitats including tea-tree thickets on sandy soils along creek systems where they are less vulnerable to predation. The species is nocturnal.

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Western Brush Wallaby *Macropus irma*

Status and Distribution: Listed as Priority 4 by DPaW. The western brush wallaby is distributed across the south-west of Western Australia from north of Kalbarri to Cape Arid (DPaW information pamphlet).

Habitat: The species optimum habitat is open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets. It is also found in some larger areas of mallee and heathland in the wheatbelt. It is uncommon in wet sclerophyll forest and absent from true karri forest that have dense undergrowth (Van Dyck & Strahan 2008).

Listed as a potential species based on available information.

Potential impact of development: Loss of small areas of potential habitat but impacts are unlikely to alter the species overall status in the wider area given the huge extent of similar habitat nearby, much of which is in national parks.

Woylie *Bettongia penicillata ogibyi*

Status and Distribution: Listed as Schedule 1 under the *WC Act* and as Endangered under the *EPBC Act*. Restricted to remnant habitat patches in south west WA where populations are managed by way of fox control and reintroduction programs (e.g. Batalling State forest, Avon Valley, Walyunga National Park and Paruna Sanctuary). Woylie populations have declined by about 80% since 2001. The declines of affected

populations in Western Australia and South Australia have been rapid, substantial (>90% lost) and apparently biased toward the largest and most important populations. The declines are continuing in some areas and as yet there have been no clear signs of a sustained post decline recovery. Most of the remaining unaffected populations are small (<300 individuals), isolated and inherently vulnerable (DEC 2012a).

Habitat: Open sclerophyll 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.

Although habitat suitable for the woylie varies across its current range, a number of key habitat requirements appear to be essential for the persistence of the species within this range. Woylies may persist in the following habitats where there is adequate introduced predator (fox and cat) control or exclusion:

- tall eucalypt forest and woodland;
- dense myrtaceous shrubland; or,
- kwongan (proteaceous) or mallee heath (DEC 2012a)

Likely presence in subject site: There are no recent records of this species in or near the subject site within the NatureMap database (DPaW 2016) and it is therefore considered unlikely to be present.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Western False Pipistrelle *Falsistrellus mackenziei*

Status and Distribution: Listed as Priority 4 by DPaW and as Near Threatened by the ICUN. Confined to south west W.A. south of Perth and east to the wheat belt. Most records from karri forests but also recorded in wetter stands of jarrah and tuart and woodlands on the Swan Coastal Plain (Menkhorst and Knight 2011). Range appears to be contracting southwards, presumably due to drying climate.

Habitat: Typically these bats are found in wet sclerophyll forest dominated by karri and in high rainfall zones of the jarrah and marri forest. They have also been recorded in mixed drier sclerophyll tuart-jarrah tall woodlands on the southern Swan Coastal Plain. Marri, sheoak and peppermint trees are often co-dominant at their collection localities. The species roosts in small colonies in tree hollows, branches and stumps (Churchill 2008). Forages at canopy level and in the larger gaps between trees.

Likely presence in subject site: This species in likely to be utilising the subject site as roosting and foraging habitat.

Listed as a potential species based on available information.

Potential impact of development: Loss of small areas of potential habitat but impacts are unlikely to alter the species overall status in the wider area given the huge extent of similar habitat nearby, much of which is in national parks.

Water Rat *Hydromys chrysogaster*

Status and Distribution: Listed as Priority 4 by DPaW. The water rat is widely distributed around Australia and its offshore islands, New Guinea and some adjacent islands. It occurs in fresh to brackish water habitats in the south-west of Western Australia, but occurs in marine environments along the Pilbara coastline and offshore islands. Previous survey work in the south west suggested this species was relatively common and widespread though difficult to capture (Christensen *et al.* 1985, How *et al.* 1987).

Habitat: The water rat occupies habitat in the vicinity of permanent water, fresh, brackish or marine. Likely to occur in all major rivers and most of the larger streams as well as bodies of permanent water in the lower south west (Christensen *et al.* 1985).

Likely presence in subject site: No suitable habitat.

Not considered a potential species based on currently available information.

Potential impact of development: No impact on this species or its preferred habitat will occur.

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

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