

Fauna Assessment (Level 1)

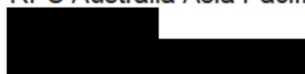


Myalup Primary Industries Reserve

Myalup

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VERSION 2

On behalf of:
RPS Australia Asia Pacific



Prepared by:
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Cover picture: Coastal Plains Skink (*Ctenotus ora*) – Greg Harewood

Acronyms/Abbreviations:

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

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

BC Act: *Biodiversity Conservation Act (2016)*. WA Government.

°C: Degrees Celsius.

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

CAMBA: China Australia Migratory Bird Agreement 1998.

CBD: Central Business District.

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

DBH: Diameter at Breast Height – tree measurement.

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

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

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

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

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

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

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

DoP: Department of Planning, WA Government.

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

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

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

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

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

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

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

EPA: Environmental Protection Authority, WA Government.

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

ha: Hectare (10,000 square metres).

IBRA: Interim Biogeographic Regionalisation for Australia.

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

JAMBA: Japan Australia Migratory Bird Agreement 1981.

km: Kilometre.

m: Metre.

mm: Millimetre.

P: Priority - DBCA fauna conservation ranking.

POS: Public Open Space.

RAOU: Royal Australia Ornithologist Union.

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

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

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

SRE: Short Range Endemic.

SSC: Species Survival Commission, International.

WA: Western Australia.

WAM: Western Australian Museum, WA Government.

WAPC: Western Australian Planning Commission, WA Government.

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

WRP: Western Ringtail Possum (*Pseudocheirus occidentalis*)

SUMMARY

This report details the results of “preliminary fauna survey” of the Myalup Primary Industries Reserve (MPIR) (the subject site) (Figure 1). The MPIR has been conceived by the Department of Primary Industry and Regional Development (DPIRD) and seeks to develop a multi-use reserve managed for conservation, silviculture, horticulture and mining (sand and limestone) purposes.

The proposed MPIR is located within part of State Forest 16 within the Shire of Harvey and comprises a total land area of approximately 5,700 ha. Within State Forest 16, the Forrest Products Commission (FPC) is currently utilising approximately 4,250 ha for pine production and the remaining 1,450ha has been retained for remnant native vegetation protection (Figure 2).

To fulfil the defined scope of works a Level 1 fauna survey has been carried out in accordance with relevant EPA technical guidance. The assessment has included a literature review and an on-site assessment with the primary aim of identifying the potential for the presence of conservation significant fauna. Based on the results, advice on the associated constraints or opportunities for the proposed development are provided.

Descriptions of the broadly defined fauna habitats, based primarily on vegetation units and landforms identified by Ecoedge (2019) are provided in Table 1, with their location and extent identified within Figure 4a and 4b. The vast majority of the subject site has been cleared of native vegetation for use as pine plantations. Overall the fauna habitat quality of these areas would therefore be very low given the areas high level of historical disturbance, and as a consequence the fauna assemblage is likely to be greatly depleted, relative to the area’s original biodiversity.

The remaining native vegetation remnants while relatively limited in extent and fragmented do however appear to be in relatively good condition and are very likely to host a wide range of fauna species including a number of fauna species of conservation significance.

Opportunistic fauna observations are listed in Appendix B. A total of 45 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the subject site during the field reconnaissance survey. Most of the fauna species recorded were common, widespread bird species. Three introduced species were also recorded.

Evidence of two listed threatened species was observed, these being Carnaby’s black cockatoo (chewed banksia and pine cones at several locations) and the western ringtail possum (scats and a drey at one location). No evidence of any listed migratory or priority fauna species was found.

A list of fauna species considered most likely to occur in the subject site has been compiled from information obtained during the literature review and is presented in Appendix B. With respect to native vertebrate fauna, 17 mammals (includes nine bat species), 116 bird, 37 reptile and nine frog species have previously been recorded in the general area, some of

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

Of the 181 native animals that are listed as potentially occurring in the area, seven are considered to be critically endangered, endangered, vulnerable or in need of special protection under State and/or Federal law. In addition, seven DBCA priority species have also been listed as potentially present. Three invertebrate species of conservation significance also have the potential to be present.

The conservation significant species identified as potentially being present within the subject site are:

- Swan Coastal Plain Shield-backed Trapdoor Spider (*Idiosoma sigillatum*) – P3 (DBCA Priority species);
- Graceful Sunmoth (*Synemon gratiosa*) – P4 (DBCA Priority species);
- Carter's Freshwater Mussel (*Westralunio carteri*) – S2 (BC Act), Vulnerable (EPBC Act);
- Pouched Lamprey (*Geotria australis*) - P4 (DBCA Priority species);
- Coastal Plains Ctenotus (*Ctenotus ora*) - P3 (DBCA Priority species);
- Perth Lined Lerista (*Lerista lineata*) - P3 (DBCA Priority species);
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) – S2 (BC Act), Endangered (EPBC Act);
- Baudin's Black Cockatoo (*Calyptorhynchus latirostris*) – S2 (BC Act), Endangered (EPBC Act);
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – S3 (BC Act), Vulnerable (EPBC Act);
- Australasian Bittern (*Botaurus poiciloptilus*) – S2 (BC Act), Endangered (EPBC Act);
- Black Bittern (*Ixobrychus flavicollis*) – P2 (DBCA Priority species);
- Little Bittern (*Ixobrychus minutus*) – P4 (DBCA Priority species);
- Peregrine Falcon (*Falco peregrinus*) - S7 (BC Act);
- Quenda (*Isoodon fusciventer*) – P4 (DBCA Priority species);
- South-western Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – S6 (BC Act);

- Western Ringtail Possum (*Pseudocheirus occidentalis*) - S1 (BC Act), Critically Endangered (EPBC Act);
- Western Brush Wallaby (*Notamacropus irma*) - P4 (DBCA Priority species); and
- Western False Pipistrelle (*Falsistrellus mackenziei*) - P4 (DBCA Priority species).

The potential impact on fauna species as a consequence of development of the MPIR will be dependent on each species population density and the quantity and quality of potential habitat that will be affected. Planning undertaken for the MPIR up to this point has however aimed to avoid the need to clear native vegetation with most development being positioned over areas of existing cleared land primarily in current use as pine plantations.

At this stage constraints on development within the MPIR which may result as a consequent of possible impacts on fauna species or their habitat would therefore appear to be minimal given proposed works are largely positioned over existing cleared areas. Stage 1 of the MPIR does not encompass any areas of native vegetation and therefore direct impacts on fauna and fauna habitat are likely to be minimal. Stages 2 and 3 do however contain some areas of native vegetation and so there is some potential for direct impact on fauna.

The exact location and nature of proposed development within the MPIR is however yet to be finalised. Ongoing planning will need to take into account the potential presence of some species of conservation significance and fauna in general so that any direct and indirect impacts can be avoided or minimised. Potential impacts of specific projects within the MPIR (e.g. silviculture, horticulture and mining) may need to be assessed individually due to varying characteristics of each activity. Management plans and protocols that aim to minimise impact on fauna and fauna habitat should be employed where relevant in each case.

1. INTRODUCTION

1.1 BACKGROUND

This report details the results of “preliminary fauna survey” of the Myalup Primary Industries Reserve (MPIR) (the subject site) (Figure 1). The MPIR has been conceived by the Department of Primary Industry and Regional Development (DPIRD) and seeks to develop a multi-use reserve managed for conservation, silviculture, horticulture and mining (sand and limestone) purposes.

The proposed MPIR is located within part of State Forest 16 within the Shire of Harvey and comprises a total land area of approximately 5,700 ha. Within State Forest 16, the Forrest Products Commission (FPC) is currently utilising approximately 4,250 ha for pine production and the remaining 1,450ha has been retained for remnant native vegetation protection (Figure 2).

Johnston Road and the McLarty Explosives Reserve provide the northern boundary of the MPIR, with Bagieau Road, Riverdale Road, Goss Road, Crampton Road, Forestry Road, Myalup Road and the Harvey River Diversion Drain providing east-west transgressions through the MPIR. The MPIR is bounded on its western boundary by Forrest Highway and private land holdings and on its eastern boundary by private land holdings.

The MPIR is to be developed and released in stages, with Stage 1 now in progress. LandCorp has been invited by the DPIRD to project manage the delivery of the Stage 1 lease sites (approximately 500 ha) for horticultural production within the MPIR.

1.2 SURVEY SCOPE

LandCorp have defined the scope of works for the “preliminary fauna survey” as including a desktop and on-site assessment of the potential for the presence of significant fauna in accordance with relevant EPA technical guidance. Based on the results, advice on the associated constraints or opportunities for the proposed development are to be provided.

The scope of works is to primarily involve but not be limited to:


- Declared Rare and Priority Fauna search;
- Commonwealth Threatened Species search.

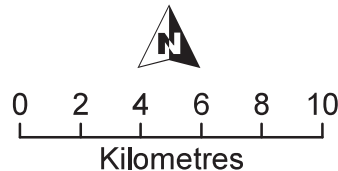
To fulfil the defined scope of works a Level 1 fauna survey has been carried out in accordance with:

- Technical Guidance - Terrestrial Fauna Surveys (EPA 2016a) and
- Technical Guidance – Sampling Methods for Terrestrial Vertebrate Fauna (EPA 2016b).



Legend

 Myalup Primary Industries Reserve - Project Area



Fauna Assessment

Drawn: G. Harewood

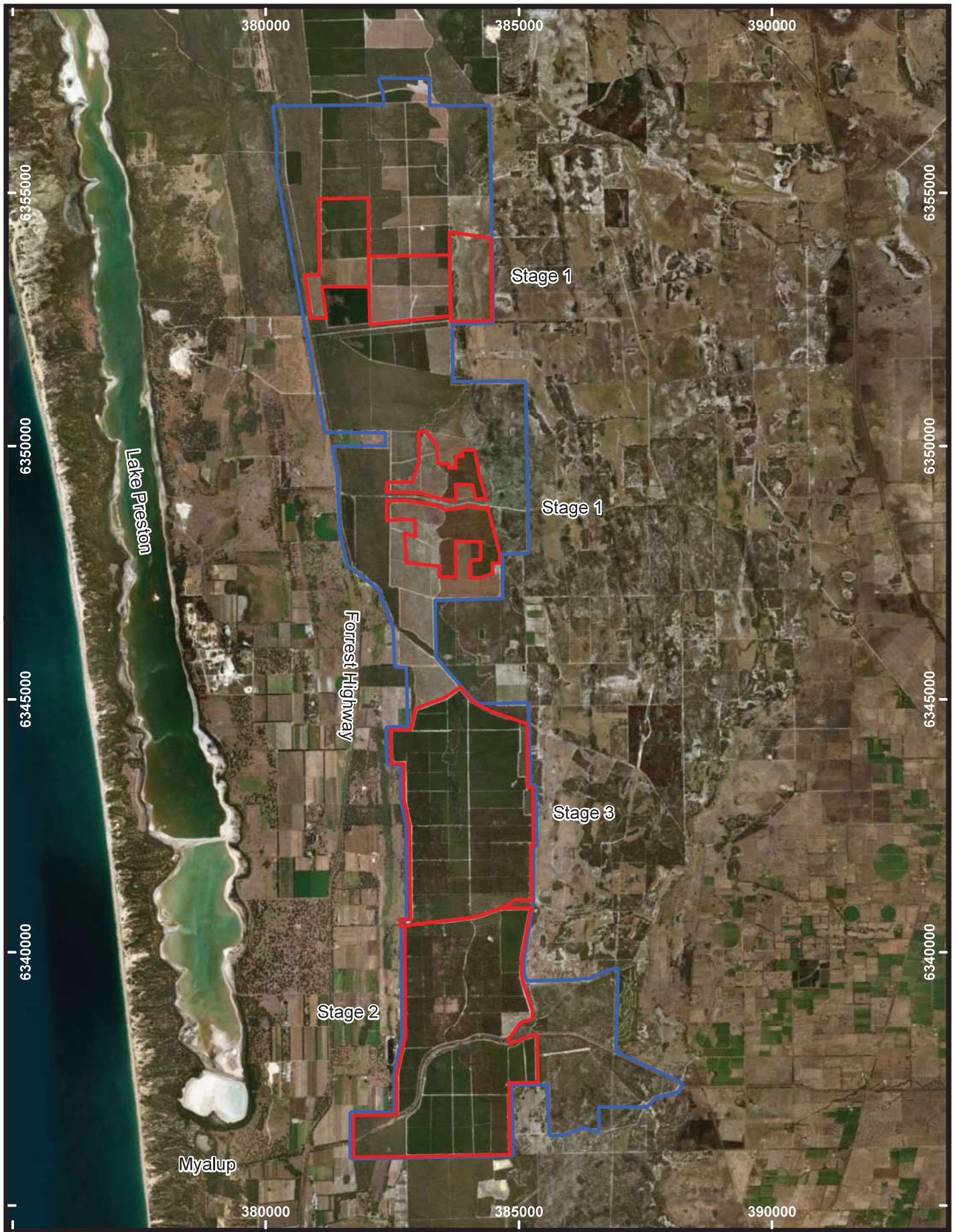
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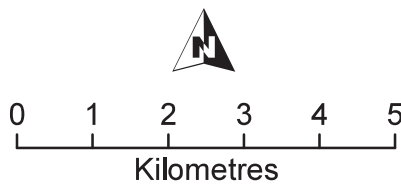
Myalup Primary Industries Reserve

Subject Site Location Plan



Legend

- Myalup Primary Industries Reserve - Project Area
- Stage Boundaries



Drawn: G. Harewood
Date: Feb 2019
Scale: 1:100,000

Projection/Coordinate System: UTM/MGA Zone 50

Myalup Primary Industries Reserve

**Subject Site
Aerial Photograph**

Figure: 2

1.3 BIOGEOGRAPHIC SETTING

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

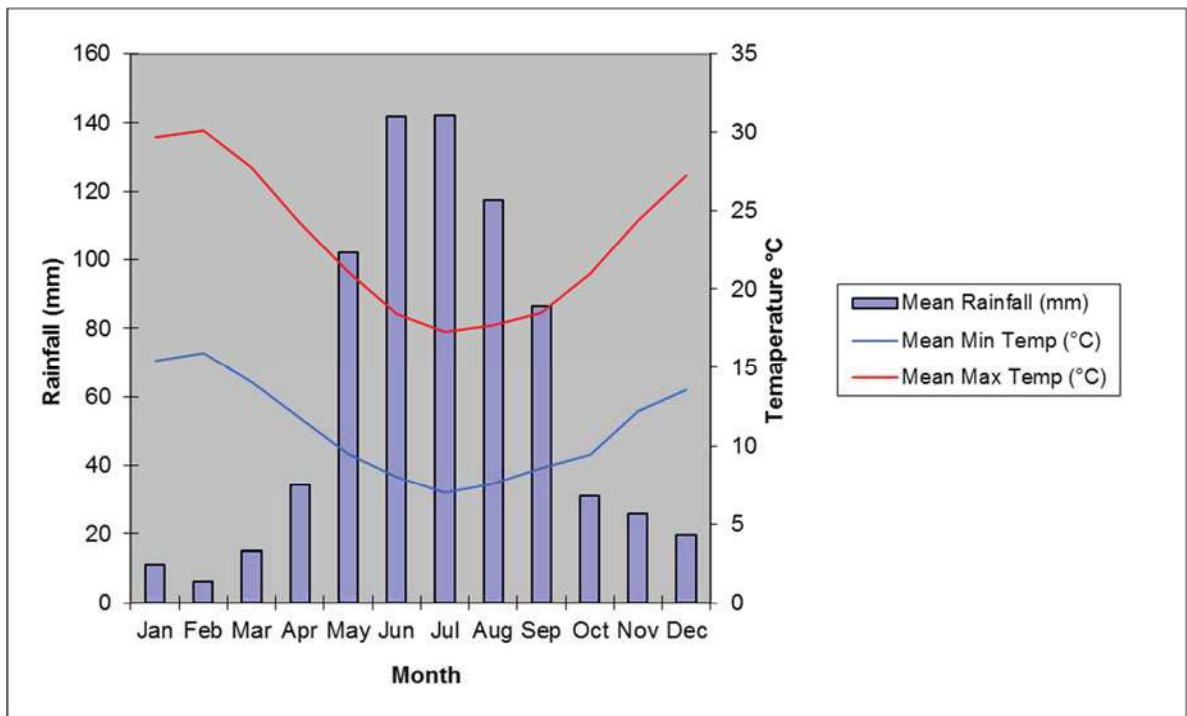
“Low lying coastal plain mainly covered with Woodlands. It is dominated by Banksia or Tuart on sandy soils, Allocasuarina obesa on outwash plains, and paperbark in swampy areas. In the east, the plain rises to duricrusted Mesozoic sediments dominated by Jarrah Woodland. Warm Mediterranean. Three phases of marine sand dune development provide relief. The outwash plains, once dominated by A. obesa – Marri Woodlands and Melaleuca shrublands, are extensive only in the south.” (Thackway and Cresswell, 1996; IBRA, 2000).

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

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

The subject site is situated in the Mediterranean climate zone of Western Australia with wet, mild winters and hot dry summers. Mean monthly maximum and minimum temperatures for Bunbury range from 17.3°C to 30.1°C and 7.0°C to 15.9°C respectively (Bureau of Meteorology 2019).

Figure 3: Mean Monthly Rainfall and Maximum and Minimum Temperatures (Bunbury - Bureau of Meteorology 2019)



The mean annual rainfall (1995 – 2019) for Bunbury is approximately 732 millimetres with rainfall occurring predominantly during the May to September period (Bureau of Meteorology 2019).

The summer wind pattern of the region is dominated by high pressure cells that create local onshore (sea breezes) and offshore (land breezes) winds, with light south-easterlies in the early hours of the morning and at night and stronger south-westerlies present during the day. The winter wind pattern is dominated by the eastward progression of rain-bearing low pressure systems and associated cold fronts with north-westerly storms.

2. METHODS

2.1 SITE SURVEYS

Daytime field survey work at the site was carried out by Greg Harewood (Zoologist) on a series of days in November and December 2018 and in January 2019.

2.1.1 Fauna Habitat Assessment

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

As part of the literature review, available information on the habitat requirements of the species of conservation significance listed as possibly occurring in the area was researched. During the daytime reconnaissance survey the habitats within the 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.

2.1.2 Opportunistic Fauna Observations

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

2.2 FAUNA INVENTORY – LITERATURE REVIEW

2.2.1 Database Searches

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

- DBCA's NatureMap Database Search (combined data from DBCA, ALA, WAM, BA and consultant's reports) (DBCA 2019); and
- Protected Matters Search Tool (DotEE 2019).

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

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

2.2.2 Previous Fauna Surveys in the Area

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

- 360 Environmental Pty Ltd (2008). Southern Seawater Desalination Project 2007, Terrestrial Flora and Fauna Survey Report. Unpublished report for the Water Corporation.
- Alan Tingay and Associates (ATA) (1998). Vertebrate Fauna. Lake Clifton Land Exchange Proposal. Unpublished report for Bouvard Investment's Pty Ltd.
- Bancroft, W., and Bamford M. (2013). South West CO2 Geosequestration Pipeline Assessment of Fauna Values. Unpublished report for Strategen Environmental Consultants.
- Bamford Consulting Ecologists (2003). Fauna Values of Cape Bouvard Investment's Pty Ltd Land, Yalgorup. Unpublished report for RPS.
- Bamford Consulting Ecologists (2008). Fauna Assessment of the Proposed South Binningup Development. Unpublished report for RPS Consulting/Mirvac.

- Bamford Consulting Ecologists (2010). Level 2 Fauna Assessment of Remnant Vegetation at the Proposed Point Grey Marina. Unpublished report for ATA Environmental.
- Bullen, R.D. (2009). Binningup Bat Survey 2009. Echolocation Survey of Bat Activity in the Lake Clifton and Lake Preston Localities on the Swan Coastal Plain. Prepared for Department of Environment and Conservation by Bat Call WA. Hillarys, Western Australia.
- Dell, J. and Hyder, B. (2009a). An Assessment of the Avifauna of the area between Dawesville and Binningup, Southern Swan Coastal Plain. Report prepared for Environmental Protection Authority, Perth.
- Dell, J. and Hyder, B. (2009b). Summary of the Fauna Values of the area between Dawesville and Binningup, Southern Swan Coastal Plain. Report prepared for Environmental Protection Authority, Perth.
- ENV Australia (ENV) (2009). Clifton Beach Fauna Assessment. Unpublished report for Cape Bouvard Investments Pty Ltd.
- Harewood, G. (2010). Fauna Survey (Level 2). Kemerton Industrial Core. Unpublished report for Cardno (WA) Pty Ltd.
- Harewood, G. (2015). Fauna Survey (Level 2). Dampier to Bunbury Natural Gas Pipeline Corridor Bristol Road (Waroona) to Clifton Road (Brunswick) Unpublished report for Aurora Environmental.
- How, R. A., Maryan, B. and Stevenson, C. A. (2009). An Assessment of Herpetofauna on Near-Coastal Landforms between Dawesville and Binningup, Southern Swan Coastal Plain. Prepared for Department of Environment and Conservation. Welshpool, Western Australia.
- Hyder, B. and Dell, J. (2009). An Assessment of the Non-volant Mammal Fauna of the area between Dawesville and Binningup, Southern Swan Coastal Plain. Report prepared for Environmental Protection Authority, Perth.

As with the databases searches some reports refer to species that would not occur in the project area due to a lack of suitable habitat (extent and/or quality) and this fact was taken into consideration when compiling the potential fauna species list for the subject site. 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.

2.2.3 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.
- 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. Third Edition, Oxford University Press, Melbourne.
- Morgan, D. & Beatty, S. (2006). Fish and freshwater crayfish communities of the Brunswick and Preston Rivers. Freshwater Fish Research, Murdoch University report to the Leschenault Catchment Council.
- 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. & Strahan, R. Eds (2008). The Mammals of Australia. Third edition. Queensland Museum.
- Wilson, S. and Swan, G. (2017). A Complete Guide to Reptiles of Australia. Third Edition, Reed, New Holland, Sydney.
- Woinarski, J., Burbidge, A. & Harrison, P. (2014). The Action Plan for Australian Mammals 2012. CSIRO Publishing.

2.2.4 Fauna Conservation Categories

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

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

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

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

Most, but not all migratory bird species listed in the annexes to these bilateral agreements are also protected in Australia as matters of national environmental significance (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 are provided in Appendix A.

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

While not classified as rare, threatened or vulnerable under any State or Commonwealth legislation, a number of bird species have been listed as of significance on the Swan Coastal portion of the Perth Metropolitan Region (Bush Forever - Government of Western Australia 1998 and 2000). The bird species are often referred to as Bush Forever Decreaser Species. While the subject site is not located within the Perth Metropolitan area the presence of decreaser species in an area can be of particular significance for the conservation of these bird species on the Swan Coastal Plain as a whole given the high degree of clearing that has and is being undertaken (Dell and Hyder 2009a).

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

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

Other fauna species of regional significance due to declining populations on the Swan Coastal Plain, especially between Mandurah and Busselton, include the honey possum and pygmy possum (Dell 2000).

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

2.2.5 Likelihood of Occurrence – Fauna of Conservation Significance

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

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

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

2.2.6 Taxonomy and Nomenclature

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

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

3. SURVEY LIMITATIONS

The fauna assessment was designed and carried out to conform with a Level 1 survey as defined in EPA (EPA 2016a and 2016b). The assessment has included a literature

review aimed at providing a list of expected species and a field reconnaissance survey that has included a review of habitats present and opportunistic observations of fauna only.

Fauna species are indicated as potentially present within this report based on there being suitable (quality and extent) habitat within the subject site. With respect to opportunistic observations, the possibility exists that certain species may not have been detected during field investigations due to:

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

The lack of observational data on some species should therefore not be taken as necessarily indicating that a species is absent from the site.

The habitat requirements and ecology of many of the species known to occur in the wider area are often not well understood or documented. It can therefore be difficult to include/exclude species from the potential list based on the apparent presence or absence of a specific habitats or microhabitats within the subject site. As a consequence of this limitation the potential fauna list produced for this report 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.

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.





4. RESULTS





4.1 SITE SURVEYS





4.1.1 Fauna Habitat Assessment





Descriptions of the broadly defined fauna habitats, based primarily on vegetation units and landforms identified by Ecoedge (2019) are provided in Table 1, with their location and extent identified within Figure 4a and 4b.





Table 1: Main Fauna Habitats within the Subject Site





Code	Fauna Habitat Description	Example Image
A1	<p>Open forest of jarrah (occasionally with tuart and marri) over woodland of peppermint and banksia over open shrubland over open hermland and very open grassland on grey or grey-brown sand on slopes.</p> <p>Mapped Area: ~372 ha</p>	
		
A2	<p>Open forest of marri and jarrah over open woodland of banksia over occasional tall shrubs over open shrubland over open hermland and very open grassland/very open sedgeland on grey-brown or yellow-brown sands on slopes.</p> <p>Mapped Area: ~73 ha</p>	
		



Code	Fauna Habitat Description	Example Image
A3	<p>Open forest of jarrah (and sometimes marri) over woodland of banksia and woody pear over open tall shrubland over open shrubland over herbland on grey sand on gentle slopes.</p> <p>Mapped Area: ~250 ha</p>	
		
B1	<p>Open forest of jarrah often with tuart over a woodland of peppermint and banksia over occasional tall shrubs over a shrubland over herbland and very open grassland on yellow brown sand on gentle slopes.</p> <p>Mapped Area: ~336 ha</p>	
		

Code	Fauna Habitat Description	Example Image
B2	<p>Open forest of tuart and/or jarrah (and sometimes marri) over woodland of peppermint and banksia over a shrubland over herbland and open sedgeland on grey-brown or yellow-brown sand on gentle slopes.</p> <p>Mapped Area: ~320 ha</p>	
		
B3	<p>Very open forest of tuart over woodland of banksia and sometimes with redheart moit mallee over tall open shrubland over shrubland over herbland on shallow limestone outcrop or yellow-brown sand over limestone.</p> <p>Mapped Area: ~74 ha</p>	
		

Code	Fauna Habitat Description	Example Image
C1	<p>Woodland to very open woodland of jarrah (and occasionally marri or banksia) or paperbark (in wetter areas) over tall open shrubland over open sedgeland and open herbland on grey-brown sand on lower slopes or flats. (A variable unit according to depth to the regional water table).</p> <p>Mapped Area: ~293 ha</p>	
		
C2	<p>Open woodland, very open woodland or shrubland of paperbark (and sometimes flooded gum or WA Christmas tree) over open tall shrubs over shrubland over very open herbland and open sedgeland on grey-brown sand on flats. (A variable unit, with species composition determined by degree of waterlogging, some inundation occurs in winter in lower-lying areas).</p> <p>Mapped Area: ~126 ha</p>	
		

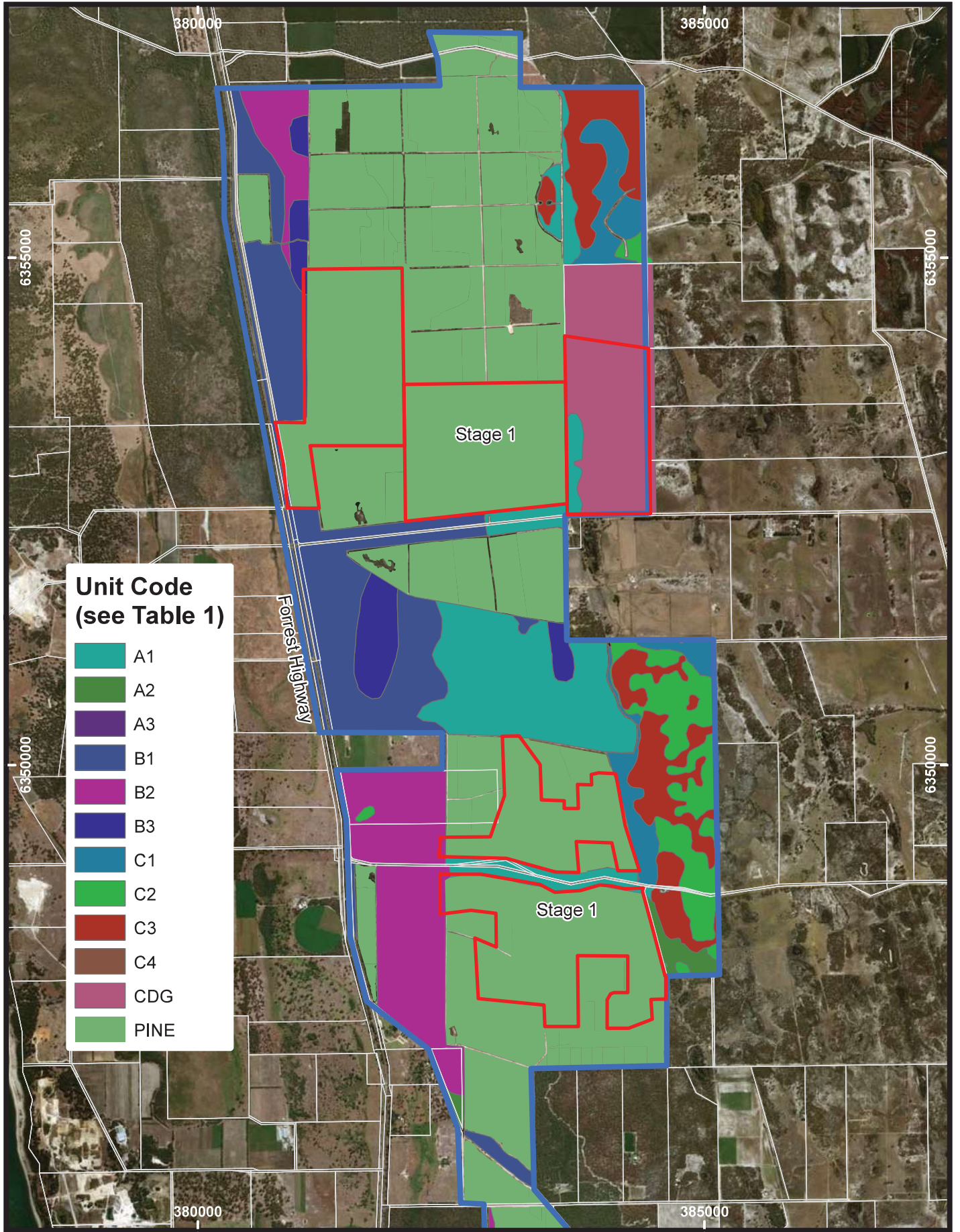
Code	Fauna Habitat Description	Example Image
C3	<p>Woodland to open woodland of paperbark (sometimes with emergent flooded gum) over shrubland to tall shrubland over sedgeland with the twiner on grey-brown sand over clay in seasonally inundated basins. (Variable according to the length of inundation and depth of water, in some places sedges may be dominant).</p> <p>Mapped Area: ~178 ha</p>	
		
C4	<p>Open forest of marri and flooded gum (or paperbark in lower areas) over woodland of paperbark (and sometimes banksia and native willow) over variable understorey that may include the sedges in lower areas, or herbaceous species and grasses in valleys on Tamala limestone ridges.</p> <p>Mapped Area: ~45 ha</p>	
		

Code	Fauna Habitat Description	Example Image
PINE	Pine Plantation Mapped Area: ~4,057 ha	
		
N/A	Harvey River Diversion Drain Mapped Length: ~6.25km ha	
		

Code	Fauna Habitat Description	Example Image
CDG	Completely Degraded Mapped Area: ~299 ha	
		

The vast majority of the subject site has been cleared of native vegetation for use as pine plantations. Overall the fauna habitat quality of these areas would therefore be very low given the areas high level of historical disturbance, and as a consequence the fauna assemblage is likely to be greatly depleted, relative to the area's original biodiversity.

The remaining native vegetation remnants while relatively limited in extent and fragmented do however appear to be in relatively good condition and are very likely to host a wide range of fauna species including a number of fauna species of conservation significance.

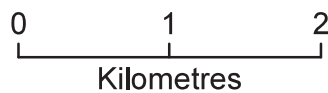


**Unit Code
(see Table 1)**

	A1
	A2
	A3
	B1
	B2
	B3
	C1
	C2
	C3
	C4
	CDG
	PINE

Legend

- Stage Boundaries
- Myalup Primary Industries Reserve - Project Area



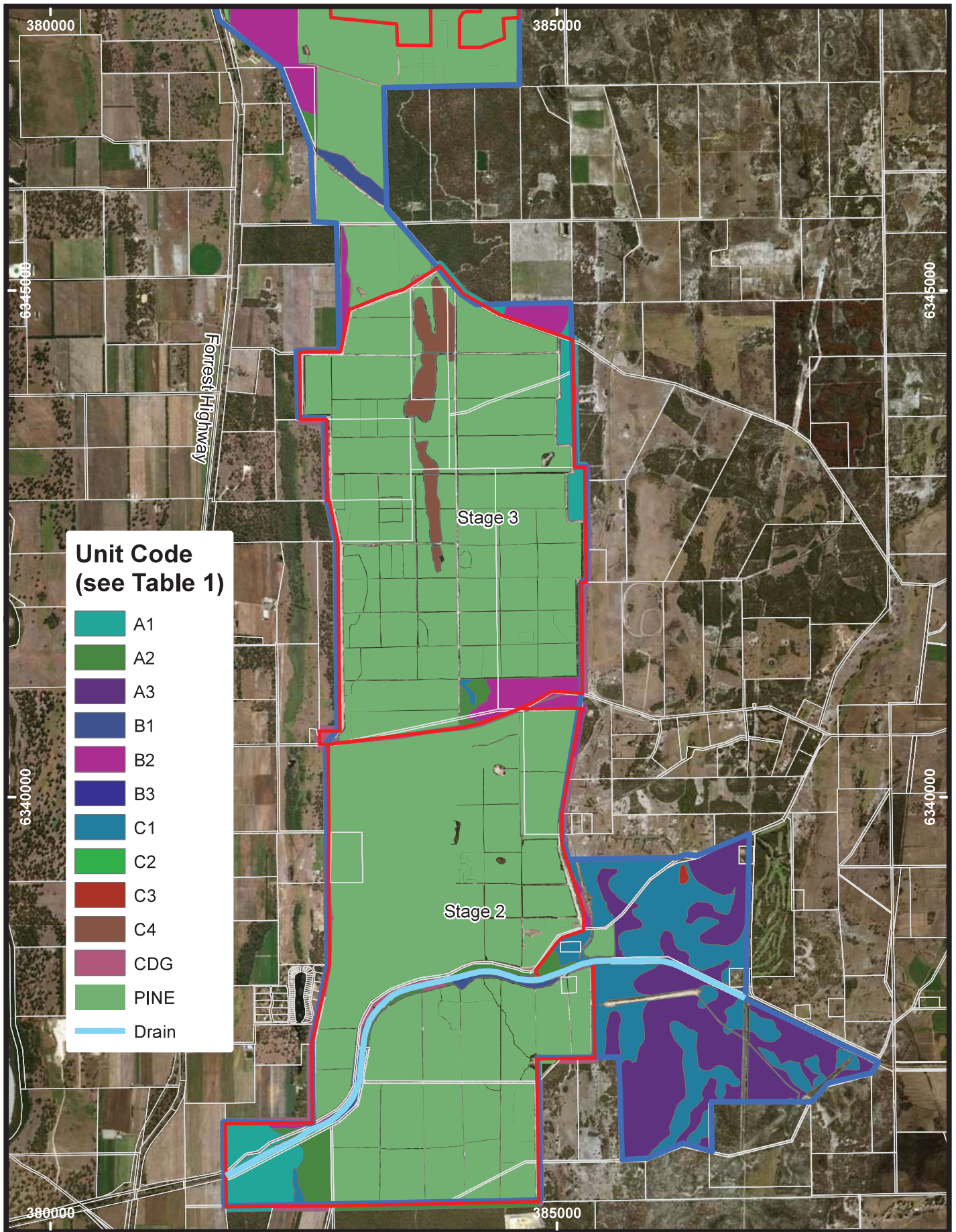
Fauna Assessment
 Drawn: G. Harewood
 Date: Feb 2019
 Scale: 1:50,000

Projection/Coordinate System: UTM/MGA Zone 50

Myalup Primary Industries Reserve

Fauna Habitats

(based on vegetation units Ecoedge 2019)

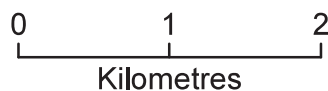


**Unit Code
(see Table 1)**

	A1
	A2
	A3
	B1
	B2
	B3
	C1
	C2
	C3
	C4
	CDG
	PINE
	Drain

Legend

- Myalup Primary Industries Reserve - Project Area
- Stage Boundaries



Fauna Assessment
 Drawn: G. Harewood
 Date: Feb 2019
 Scale: 1:50,000

Myalup Primary Industries Reserve

Fauna Habitats

(based on vegetation units Ecoedge 2019)

4.1.2 Opportunistic Fauna Observations

Opportunistic fauna observations are listed in Appendix B with a summary list provided in the table below.

Table 2: Opportunistic Fauna Observations

Common Name	Genus & Species
Mosquito Fish*	<i>Gambusia holbrooki</i>
Slender Tree Frog	<i>Litoria adelaidensis</i>
Sand Monitor	<i>Varanus gouldii</i>
Bobtail	<i>Tiliqua rugosa</i>
Buchanan's Snake-eyed Skink	<i>Cryptoblepharus buchananii</i>
West Coast Pale-flecked Morethia	<i>Morethia lineoocellata</i>
Dugite	<i>Pseudonaja affinis</i>
Emu	<i>Dromaius novaehollandiae</i>
Pacific Black Duck	<i>Anas superciliosa</i>
Straw-necked Ibis	<i>Threskiornis spinicollis</i>
Whistling Kite	<i>Haliastur sphenurus</i>
Australian Kestrel	<i>Falco cenchroides</i>
Common Bronzewing	<i>Phaps chalcoptera</i>
Crested Pigeon	<i>Ocyphaps lophotes</i>
Australian Ringneck	<i>Platycercus zonarius</i>
Elegant Parrot	<i>Neophema elegans</i>
Galah	<i>Cacatua roseicapilla</i>
Red-capped Parrot	<i>Platycercus spurius</i>
Regent Parrot	<i>Polytelis anthopeplus</i>
Carnaby's Black-Cockatoo	<i>Calyptorhynchus latirostris</i>
Laughing Kookaburra*	<i>Dacelo novaeguineae</i>
Splendid Fairy-wren	<i>Malurus splendens</i>
Broad-tailed Thornbill	<i>Acanthiza apicalis</i>
Weebill	<i>Smicrornis brevirostris</i>
White-browed Scrubwren	<i>Sericornis frontalis</i>
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>
Western Gerygone	<i>Gerygone fusca</i>
Striated Pardalote	<i>Pardalotus striatus</i>
Brown Honeyeater	<i>Lichmera indistincta</i>
Red Wattlebird	<i>Anthochaera carunculata</i>
Western Whistler	<i>Pachycephala occidentalis</i>
Rufous Whistler	<i>Pachycephala rufiventris</i>
Grey Fantail	<i>Rhipidura fuliginosa</i>
Magpie-lark	<i>Grallina cyanoleuca</i>
Willie Wagtail	<i>Rhipidura leucophrys</i>
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>

Common Name	Genus & Species
Black-faced Woodswallow	<i>Artamus cinereus</i>
Australian Magpie	<i>Cracticus tibicen</i>
Grey Butcherbird	<i>Cracticus torquatus</i>
Australian Raven	<i>Corvus coronoides</i>
Australian Pipit	<i>Anthus australis</i>
Tree Martin	<i>Hirundo nigricans</i>
Welcome Swallow	<i>Hirundo neoxena</i>
Silvereye	<i>Zosterops lateralis</i>
Common Brushtail Possum	<i>Trichosurus vulpecula</i>
Western Ringtail Possum	<i>Pseudocheirus occidentalis</i>
Western Grey Kangaroo	<i>Macropus fuliginosus</i>
Rabbit*	<i>Oryctolagus cuniculus</i>

*Introduced species

A total of 45 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the subject site during the field reconnaissance survey. Most of the fauna species recorded were common, widespread bird species. Three introduced species were also recorded.

Evidence of two listed threatened species was observed, these being Carnaby's black cockatoo (chewed banksia and pine cones at several locations) and the western ringtail possum (scats and a drey at one location) (see Figure 9). No evidence of any listed migratory or priority fauna species was found.

4.2 FAUNA INVENTORY – LITERATURE REVIEW

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

The results of some previous fauna surveys carried out in the general area are summarised in this species listing as are the DBCA NatureMap database search results. The raw database search results from NatureMap (DBCA 2019) and the Protected Matters Search Tool (DotEE 2019) are contained within Appendix C.

The list of potential fauna takes into consideration that the subject site is within the current documented range of the species, the species in question is not known to be locally extinct and that suitable habitat for each species, as identified during the habitat assessment, is present. Compiling an accurate list does however have limitations (see Section 3 above) and therefore as discussed, the listing is very likely to be an overestimation of the fauna species actually present within the subject site at any one time.

Table 3 summarises the numbers of potential species based on vertebrate class.

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

Group	Total number of potential species	Potential number of <u>Specially Protected</u> species	Potential number of <u>Migratory</u> species	Potential number of <u>Priority</u> species	Number of species recorded this survey
Fish	3 ¹	0	0	0	1
Amphibians	9	0	0	0	1
Reptiles	37	0	0	2	5
Birds	119 ³	5	0	2	37 ¹
Non-Volant Mammals	17 ⁹	2	0	2	4 ¹
Volant Mammals (Bats)	9	0	0	1	0
Total	194 ¹³	7	0	7	48 ³

Superscript = number of introduced species included in total.

With respect to native vertebrate fauna, 17 mammals (includes nine bat species), 116 bird, 37 reptile and nine frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the subject area at times. Thirteen species of introduced animals could also frequent the area.

Of the 181 native animals that are listed as potentially occurring in the area, seven are considered to be critically endangered, endangered, vulnerable or in need of special protection under State and/or Federal law. In addition, seven DBCA priority species have also been listed as potentially present. Three invertebrate species of conservation significance also have the potential to be present. These species are discussed in further detail in the following sections.

As previously discussed not all species listed in existing databases and publications as potentially occurring within the general area are shown in the expected listing in Appendix C. Some species have been excluded from this list based largely on the lack of suitable or known local/regional extinction. Species that may occasionally occur as vagrants/transients have also not been listed as potential species.

Table 4 below provides an assessment of the likelihood of occurrence of fauna species of conservation significance previously recorded in the general area and reasons for the inclusion and omission from the potential fauna list.

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

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments
	BC Act/ DBCA Priority	EPBC Act				
Swan Coastal Plain Shield-backed Trapdoor Spider <i>Idiosoma sigillatum</i>	P3	-	Burrows of this species usually found in Banksia woodland and heathland on sandy soils.	Yes	Possibly Occurs.	May occur though there are no records of this species in this area, possibly due to a lack of surveys.
Graceful Sunmoth <i>Syneon gratiosa</i>	P4	-	Banksia woodland/woolly bush on deep sands, Breeds on <i>Lomandra hermaphrodita</i> and open areas of herbland, heathland and shrubland on Quindalup soils (sand and limestone) close to the coast where it breeds on <i>Lomandra maritima</i>	Yes	Possibly Occurs.	May occur though there are no records of this species in this area, possibly due to a lack of surveys.
Carter's Freshwater Mussel <i>Westralunio carteri</i>	S3	VU	Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots.	Yes/Marginal	Possibly Occurs.	May occur though there are no records of this species in this area, possibly due to a lack of surveys.
Pouched Lamprey <i>Geotria australis</i>	P3	-	This species lives in mud burrows in the upper reaches of coastal streams for the first 4 years of life until migrating to the sea. Adults migrate up to 60km upstream during spawning.	Yes/Marginal	Possibly Occurs.	May occur though there are no records of this species in this area, possibly due to a lack of surveys.
Black-stripe Minnow <i>Galaxiella nigrofriata</i>	S2	-	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)	No/Marginal	Would Not Occur.	Some small seasonal wetlands but these are very unlikely to support this species.
Coastal Plains Skink <i>Ctenotus ora</i>	P3	-	Sandy substrates with low vegetation (including heath) in open <i>Eucalyptus/Corymbia</i> woodland over <i>Banksia</i> .	Yes	Known to Occur	Previously recorded in the MPIR area (Harewood 2014).
Perth Lined Skink <i>Lerista lineata</i>	P3	-	Inhabits loose white sands and leaf litter under areas of shrubs and heath particularly in association with banksias.	Yes	Possibly Occurs.	Recorded at several nearby locations including Kemerton and Yalgorup.
Malleefowl <i>Leipoa ocellata</i>	S3	VU	Mainly scrubs and thickets of mallee <i>Eucalyptus</i> spp., boree <i>Melaleuca lanceolata</i> and bowgada <i>Acacia linophylla</i> , also dense litter forming shrublands.	No	Would Not Occur. Regionally extinct.	This species has not been recorded on the coastal plain for over 50 years.
Blue-billed Duck <i>Oxyura australis</i>	P4	-	Well vegetated freshwater swamps, large dams and lakes, winters on more open water. Occasionally salt lakes and estuaries freshened by floodwaters.	No/Marginal	Would Not Occur.	Wetland habitats appear unsuitable.
Hooded Plover <i>Charadrius rubricollis</i>	P4	-	Broad sandy ocean beaches and bays, coastal and inland salt lakes.	No	Would Not Occur.	There is no suitable habitat for this species in the project area.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments
	BC Act/ DBCA Priority	EPBC Act				
Migratory Shorebirds/Wetland Species/Marine Species (various reptiles, birds and mammals)	S5, Various	Ma, Mig, Various	Varies between species but includes open ocean, beaches and permanent/temporary wetlands varying from billabongs, swamps, lakes, floodplains, sewerage farms, saltwork ponds, estuaries, lagoons, mudflats sandbars, pastures, airfields, sports fields and lawns.	No/Marginal	Would Not Occur.	Most species would not occur due to a lack of suitable habitat. In some cases habitat may be marginally suitable for some species but it would not be an area of significance for any species.
Eastern Osprey <i>Pandion haliaetus</i>	S5	Ma, Mig	Coasts, estuaries, bays, inlets, islands, and surrounding waters, coral atolls, reefs, lagoons, rock cliffs and stacks. Ascends larger rivers.	No	Unlikely to Occur, Flyover only on very rare occasions.	This species would largely confine its activities to coastal areas in this region.
Peregrine Falcon <i>Falco peregrinus</i>	S7	-	Diverse from rainforest to arid shrublands, from coastal heath to alpine. Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes.	Yes	Possibly Occurs.	Uncommon but the MPPIR may represent part of a larger home range used by individuals of this species.
Masked Owl (SW population) <i>Tyto n. novaehollandiae</i>	P3	-	Roosts and nests in heavy forest, hunts over open woodlands and farmlands.	Yes/Marginal	Unlikely to Occur.	Rarely recorded in his part of the south west.
Barking Owl (SW population) <i>Ninox connivens connivens</i>	P2	-	Dense vegetation, especially forest and thickets of waterside vegetation such as <i>melaleucas</i> . Roosts in tree hollows.	Yes/Marginal	Unlikely to Occur.	Rarely recorded in his part of the south west.
Australasian Bittern <i>Botaurus poiciloptilus</i>	S1	EN	Freshwater wetlands, occasionally estuarine; prefers heavy vegetation such as beds of tall dense <i>Typha</i> , <i>Baumea</i> and sedges in freshwater swamps.	Yes/Marginal	Possibly Occurs	Possibly occurs but probably only rarely has wetland habitats appear marginal.
Black Bittern <i>Ixobrychus flavicollis</i>	P1	-	Freshwater pools, swamps and lagoons well screened with trees. Shelters in dense waterside vegetation.	Yes/Marginal	Possibly Occurs	Possibly occurs but probably only rarely has wetland habitats appear marginal.
Little Bittern <i>Ixobrychus minutus</i>	P4	-	Dense vegetation surrounding/within freshwater pools, swamps and lagoons, well screened with trees. Shelters in dense beds of <i>Typha</i> , <i>Baumea</i> and tall rushes in freshwater swamps around lakes and along rivers.	Yes/Marginal	Possibly Occurs	Possibly occurs but probably only rarely has wetland habitats appear marginal.
Camaby's Black Cockatoo <i>Calyptorhynchus latirostris</i>	S2	EN	Forests, woodlands, heathlands, farms; feeds on <i>Banksia</i> , <i>Hakea</i> and Marri.	Yes	Known to Occur	Large areas of foraging habitat including pines and potential breeding habitat.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments
	BC Act/ DBCA Priority	EPBC Act				
Baudin's Black Cockatoo <i>Calyptorhynchus baudinii</i>	S2	EN	Mainly eucalypt forests where it feeds primarily on the marri seeds.	Yes	Possibly Occurs.	Large areas of foraging habitat including pines and potential breeding habitat.
Forest Red-tailed Black Cockatoo <i>Calyptorhynchus banksii riaso</i>	S3	VU	Eucalypt forests, feeds on marri, jarrah, blackbutt, karri, sheoak and snottygobble.	Yes	Possibly Occurs.	Areas of foraging habitat and potential breeding habitat.
Fork-tailed Swift <i>Apus pacificus</i>	S5	Ma, Mig	Low to very high airspace over varied habitat from rainforest to semi desert.	Yes	Unlikely to Occur, Flyover only on very rare occasions.	May occur very occasionally for brief periods.
Grey Wagtail <i>Motacilla cinerea</i>	S5	Mig, Ma	In Australia, near running water in disused quarries, sandy, rocky streams in escarpments and rainforest, sewerage ponds, ploughed fields and airfields.	No	Would Not Occur.	Never recorded in this area.
Chuditch <i>Dasyurus geoffroii</i>	S3	VU	Forest, mallee shrublands, woodland and desert. The densest populations have been found in riparian jarrah forest.	Yes	Unlikely to Occur Locally extinct?	Very rarely recorded on the coastal plain. Occasional transients only.
South-western Brush-tailed Phascogale <i>Phascogale tapoatata wambenger</i>	S6	-	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover.	Yes	Known to Occur	Previously recorded in the MPIR area (Harewood 2014).
Quenda <i>Isodon fusciventer</i>	P4	-	Dense scrubby, often swampy, vegetation with dense cover.	Yes	Known to Occur	Previously recorded in the MPIR area (Harewood 2014).
Western Ringtail Possum <i>Pseudocheirus occidentalis</i>	S1	VU	Coastal peppermint, coastal peppermint-tuart, jarrah-marri associations, sheoak woodland, and eucalypt woodland and mallee.	Yes	Known to Occur.	Scats and a drey Recorded during field survey in bushland adjacent to Bagleau Road.
Quokka <i>Setonix brachyurus</i>	S3	VU	Currently restricted to densely vegetated coastal heaths, swamps, riverine habitats including tea-tree thickets on sandy soils along creek systems.	Yes	Would Not Occur. Locally extinct.	None Identified/Negligible
Western Brush Wallaby <i>Macropus irma</i>	P4	-	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets.	Yes	Known to Occur.	Previously recorded in the MPIR area (Harewood 2014).
Western False Pipistrelle <i>Falstrelilus mackenziei</i>	P4	-	Wet sclerophyll forest dominated by karri and in high rainfall zones of the jarrah and marri forest.	Yes	Possibly Occurs.	Recorded during several surveys in nearby areas.
Water Rat <i>Hydromys chrysogaster</i>	P4	-	Permanent water, fresh, brackish or marine.	No	Would Not Occur.	None Identified/Negligible

See Appendix A for conservation status codes

5. DISCUSSION - FAUNA ASSEMBLAGES

5.1 INVERTEBRATES

5.1.1 Invertebrate Assemblage

The overall invertebrate assemblage present within the MPIR area is likely to be highly diverse but poorly documented and therefore no attempt has been made to provide a listing of the species potentially present. The assessment has therefore been confined to reviewing available data on invertebrate species of conservation significance previously recorded in the general area.

5.1.2 Invertebrates of Conservation Significance

Three invertebrate species of conservation significance appeared in the NatureMap (DBCA 2019) and Protected Matters (DotEE 2019) database searches, these being:

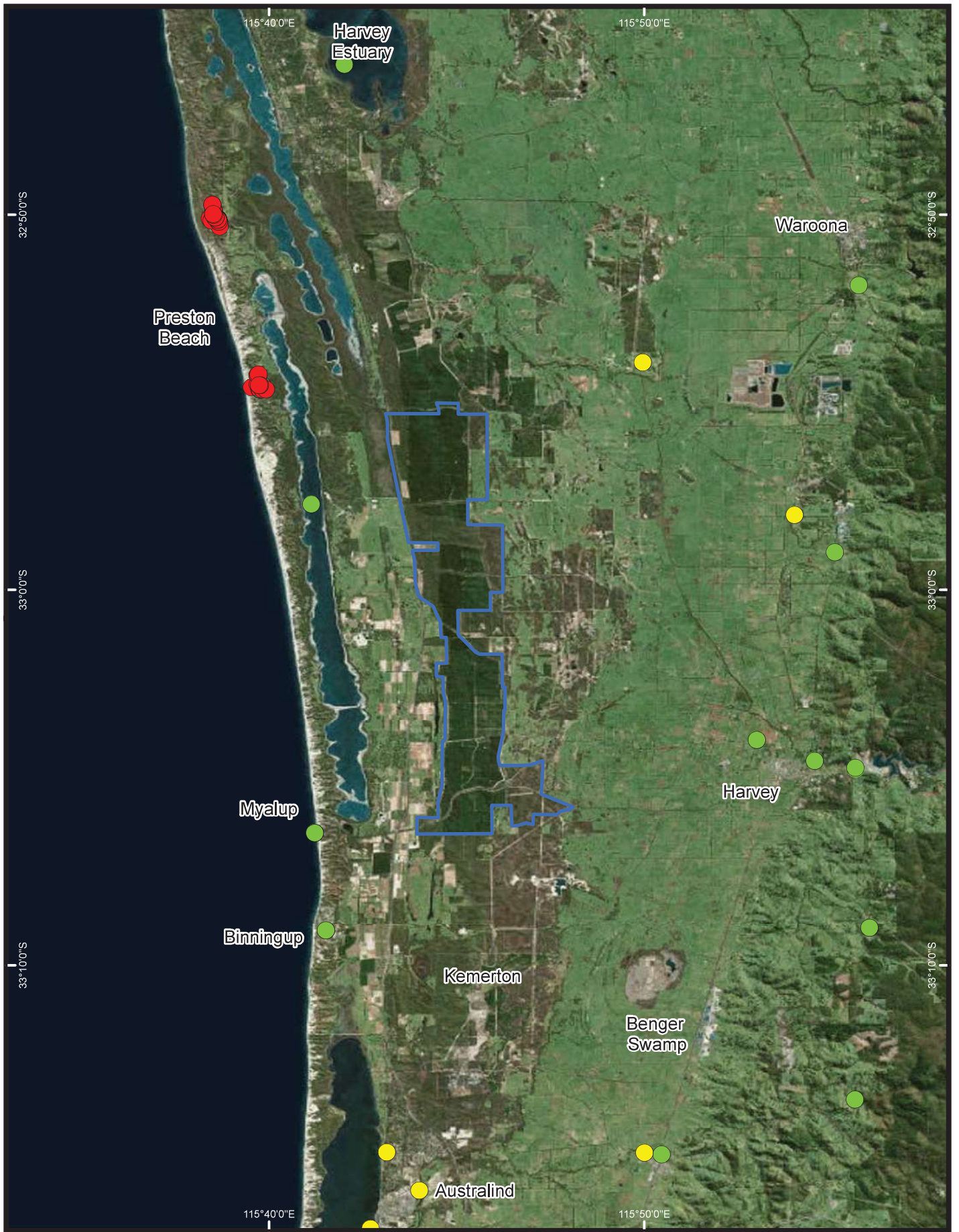
- Swan Coastal Plain Shield-backed Trapdoor Spider (*Idiosoma sigillatum*) – P3 (DBCA Priority species);
- Graceful Sunmoth (*Synemon gratiosa*) – P4 (DBCA Priority species); and
- Carter's Freshwater Mussel (*Westralunio carteri*) – S2 (BC Act), Vulnerable (EPBC Act)

None of the above-mentioned species appear to have been recorded within the boundary of the MPIR though this could simply be a consequence of a lack of detailed surveys and/or reporting (Figure 5). Due to the lack of information it is difficult to predict whether any of these species may actually occur within the MPIR.





Burrows of Swan Coastal Plain shield-backed trapdoor species are usually found in *Banksia* woodland and heathland on sandy soils. Given the presence of what appears to be suitable habitat for this species it must be assumed to be present in some sections of the MPIR.

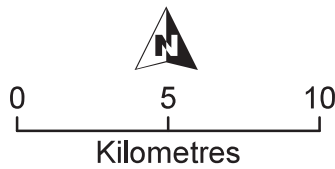
In inland areas away from the coast the graceful sunmoth typically occurs in banksia woodland/woolly bush on deep sands and requires the plant *Lomandra hermaphrodita* to breed. Given the presence of what appears to be suitable habitat for this species containing *Lomandra hermaphrodita* (Ecoedge 2019) it must also be assumed to be present in some sections of the MPIR.

The only habitat suitable for the Carter's freshwater mussel is represented by the Harvey River Diversion Drain. This is a man-made drain with connections to natural waterways including the Harvey River where the mussel has been recorded relatively recently near the Harvey townsite (NatureMap records from 2010 - see Figure 5). This species may therefore occur in some sections of this drain though its current status in the MPIR itself is unknown.



Legend

-  MPIR - Project Area
-  Swan Coastal Plain Shield-backed Trapdoor Spider
-  Graceful Sunmoth
-  Carter's Freshwater Mussel



Fauna Assessment

Drawn: G. Harewood

Date: March 2019

Scale: 1:250,000

Projection/Coordinate System: UTM/MGA Zone 50

**Myalup Primary Industries Reserve
NatureMap Records
Invertebrates of Conservation Significance**

Figure: 5

5.1.3 Regional Endemism, Distribution Limits and Rare Assemblages

The potential invertebrate assemblage while not specifically documented is likely to be comprised of mainly of common, widespread species that are often found in similar habitats in the south west. It is unlikely to be specifically unique or rare. However, given that vegetation with the southern Swan Coastal Plain has been subject to major fragmentation and alteration, any areas of remnant vegetation and the assemblages they contain can be regarded as being of at least local significance.

5.2 FISH

5.2.1 Fish Assemblage

The MPIR contains a number of small seasonal wetlands, some man-made dams, small drains and the Harvey River Diversion Drain. All of the natural wetlands present in the MPIR are seasonal in nature and as most native fish species previously recorded in the wider area cannot survive when these are dry, they are considered as unlikely to be present. Based on the limited extent of suitable wetland habits and the degraded state of the Harvey River Diversion Drain the fish assemblage is considered as most likely to be limited to two relatively common native species (the nightfish and the western pygmy perch). The presence of the introduced mosquito fish (*Gambusia holbrooki*) in the Harvey River Diversion Drain was confirmed during the survey period.

Previous surveys in the wider area also found a limited range of fish species or none at all due to a lack of wetland habitats (Harewood 2010 & 2104, 360 Environment (2008), Bamford (2008), Western Wildlife (2008), ENV (2009)).

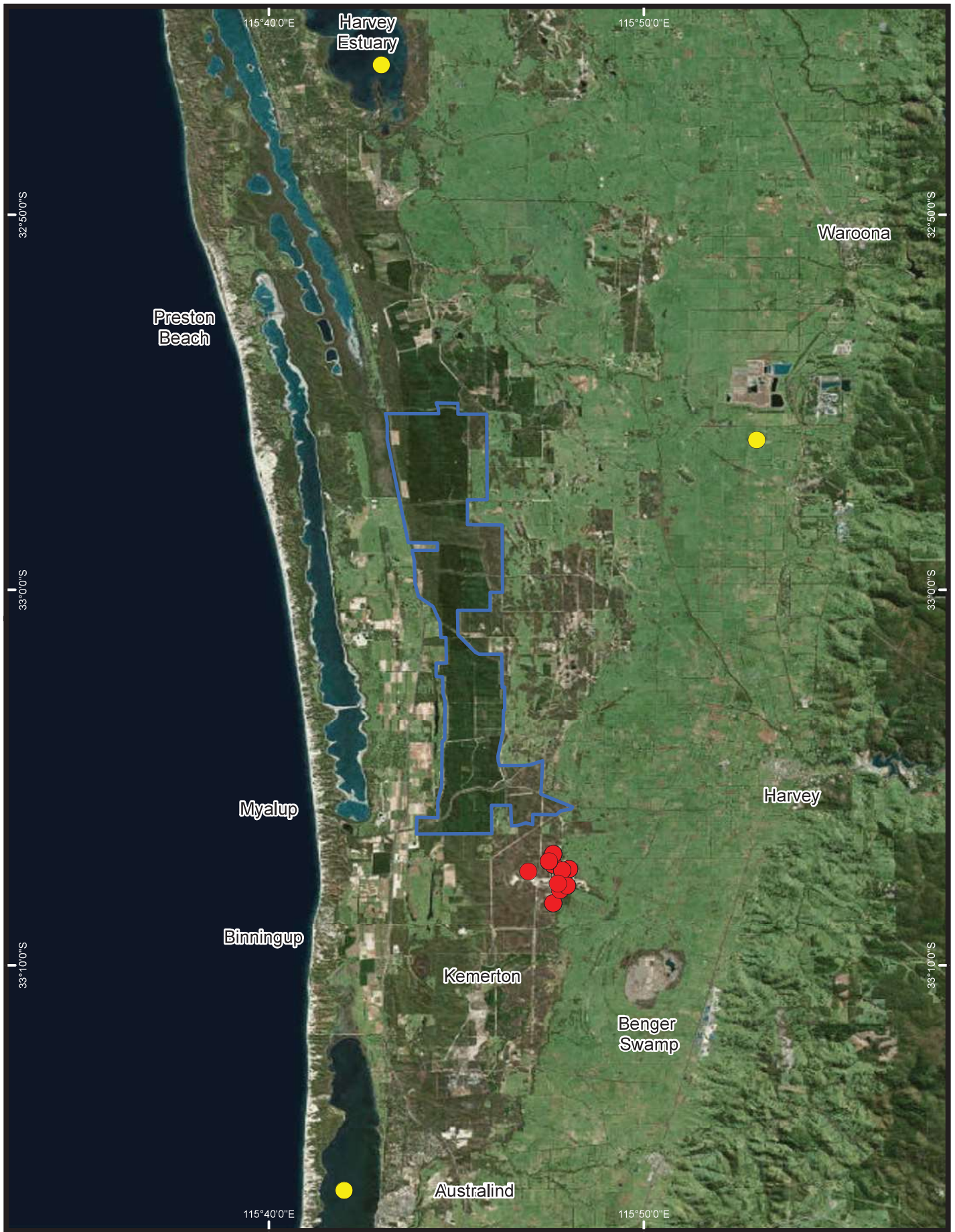
5.2.2 Fish of Conservation Significance

The pouched lamprey (*Geotria australis*), a Priority 3 DBCA species has previously been recorded from the Harvey Estuary and Samson Brook which suggests it may also utilise the Harvey Diversion Drain though no records of its occurrence in this water way appear in NatureMap (Figure 6). Records in the Harvey Estuary and Sampson Brook are also limited in number and were made some time ago also reducing the likelihood of this species being present. Its actual status in the Harvey Diversion Drain cannot be determined without detailed survey.

The black-stripe minnow (*Galaxiella nigrostriata*), a state listed Schedule 2 (Endangered) species, is only known in the southern Swan Coastal Plain area to refuge in a small number of wetlands within the Kemerton Silica Sands (KSS) property (Figure 6). These refuge wetlands (where the fish can survive dry periods) do not fall within the bounds of the MPIR and it is considered highly unlikely that the small seasonal wetlands within the MPIR itself represent suitable habitat for this species.

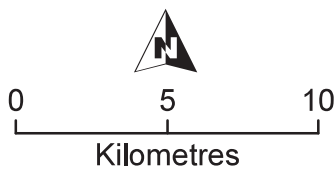
5.2.3 Regional Endemism, Distribution Limits and Rare Assemblages

The potential native fish assemblage is limited to two common, widespread species that are often found together in many south west rivers and therefore the assemblage cannot be regarded as unique or rare.



Legend

- MPIR - Project Area
- Pouched Lamprey
- Black-stripe Minnow



Fauna Assessment

Drawn: G. Harewood

Date: March 2019

Scale: 1:250,000

Projection/Coordinate System: UTM/MGA Zone 50

**Myalup Primary Industries Reserve
NatureMap Records
Fish of Conservation Significance**

Figure: 6

5.3 AMPHIBIANS

5.3.1 Amphibian Assemblage

Nine frog species are considered as potentially occurring with the MPIR. One species, the slender tree frog (*Litoria adelaidensis*) was recorded in the Harvey Diversion Drain (see Appendix B).

During a survey along the nearby Dampier Bunbury Natural Gas Pipeline (DBNGP) all nine species were recorded (Harewood 2014).

5.3.2 Amphibians of Conservation Significance

None of the potential amphibian species are listed as threatened or as DBCA priority species and all can be regarded as common within suitable habitat across their respective ranges.

5.3.3 Regional Endemism, Distribution Limits and Rare Assemblages

None of the amphibian species likely to occur within the MPIR are restricted specifically to the central Swan Coastal Plain area and all have widespread distributions across the south west both to the north, south and inland.

How *et al.* (2009), in their analysis of the amphibian fauna known from the area between Binningup to Dawesville, concluded the assemblage was similar to others recorded in the region and from most others recorded on the Southern Swan Coastal Plain, though it was noted that the presence of the ticking frog (*Geocrinia leai*), which they recorded at Myalup, was the most northerly known population on the Swan Coastal Plain. This gave the assemblage in the area a significantly different relationship to all others examined on the Swan Coastal Plain (How *et al.* 2009).

5.4 REPTILES

5.4.1 Reptile Assemblage

Based on the results of the literature review 37 reptile species are considered as potential species, subject to suitable habitat being present. Five species were recorded during the field reconnaissance survey (see Appendix B).

Harewood (2015) recorded 18 species along the DBNGP route and a total of 22 reptile species from the Kemerton buffer zone (Harewood 2010). 360 Environment (2008) recorded 21 species at the Binningup Desalination Plant site, while Bamford (2008) and Western Wildlife (2008) reported 13 and 17 species respectively from sites near the Binningup town site. Other studies reported more species, these being How *et al.* (2009) where 24 species were recorded and ENV (2009), 28 species.

5.4.2 Reptiles of Conservation Significance

Two reptile species of conservation significance are considered as likely to be present these being:

- Coastal Plains Ctenotus (*Ctenotus ora*) - P3 (DBCAs Priority species); and
- Perth Lined Lerista (*Lerista lineata*) - P3 (DBCAs Priority species).

Ctenotus ora is a recently described species of medium sized skink with a restricted range mainly confined to the Swan Coastal Plain, most of which has been cleared for agriculture and urban development.

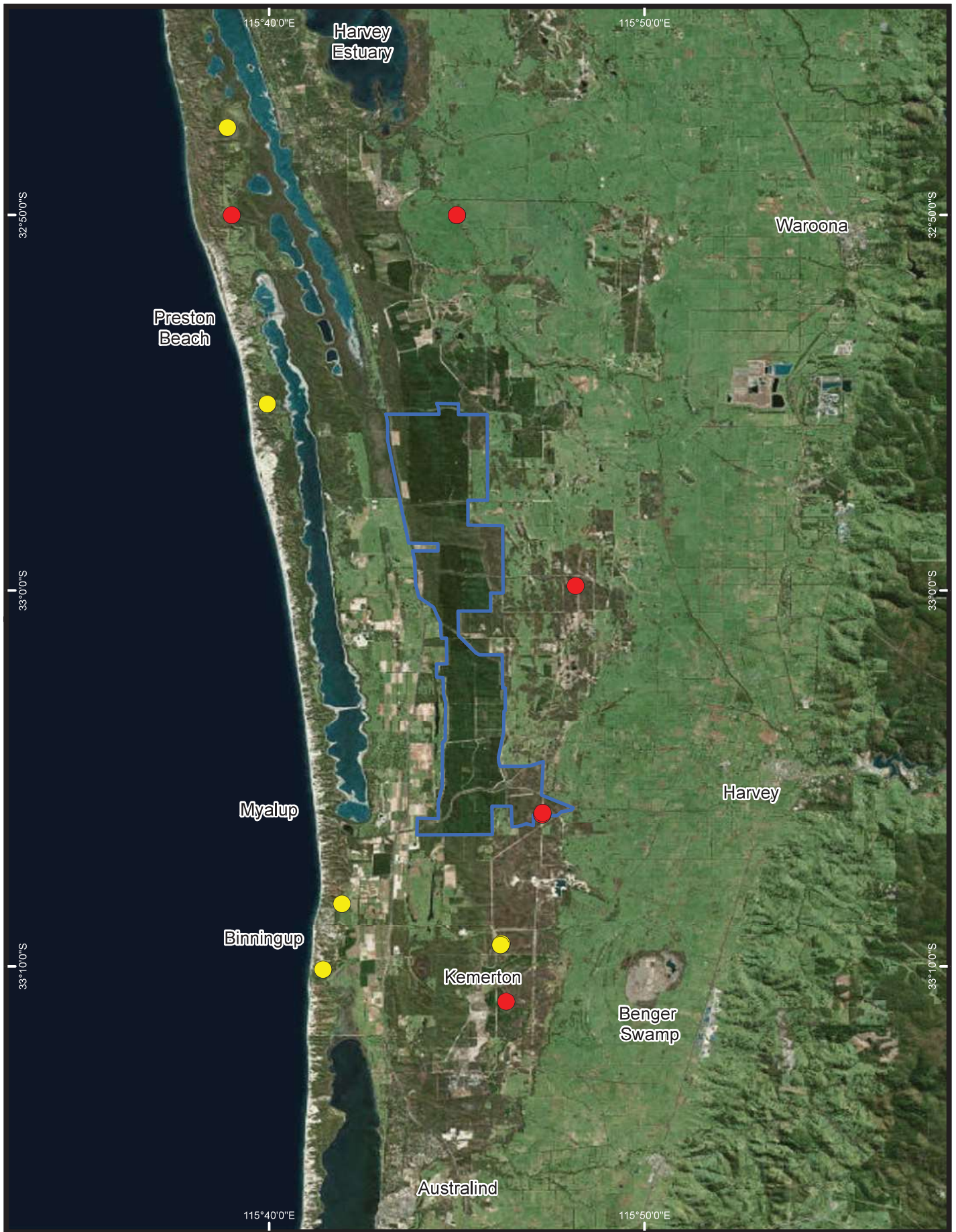
Four *Ctenotus ora* specimens were collected during a fauna survey along the DBNGP route, and several from an area within the MPIR itself (Harewood 2014) (Figure 7). The species was also recorded at Kemerton in 2010 (Harewood 2010). None of the other main surveys referenced in the wider area have recorded the species except for Bamford (2010) at Point Grey, though this is over 20km north of the MPIR project area.

The Perth lined lerista is known from Kemerton (Harewood 2010) but appears to be more common along the near coastal strip where it has been recorded in most surveys carried out in this area (e.g. Western Wildlife 2008, 360 Environmental 2008, Bamford 2008 and ENV 2009) (Figure 7). It may therefore be present in areas of suitable habitat within the MPIR.




5.4.3 Regional Endemism, Distribution Limits and Rare Assemblages

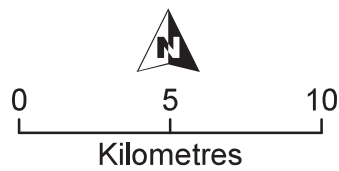
None of the reptile species considered as likely to occur are restricted specifically to this section of the coastal plain though several species/assemblages could be regarded as locally/regionally significant. In particular the known presence of the coastal plains skink and the possible presence of the Perth lined lerista can be considered of local significance.

How *et al.* (2009), in their analysis of the reptile fauna known from the area between Binningup to Dawesville concluded that it was highly probable that the reptile assemblage of the near-coastal dunes south of Dawesville represent important contiguous distributions of populations that have been subjected to major fragmentation, alteration and extinctions further north on the Swan Coastal Plain. While much of the MPIR site is cleared and fragmented it does contain some areas of vegetation which extend, and in some cases join remnants to the west and therefore this same conclusion about the significance of the assemblage, while possibly slightly less diverse, can be drawn.



Legend

-  MPIR - Project Area
-  Perth Lined Lerista
-  Coastal Plains Ctenotus



Fauna
Assessment

Drawn: G. Harewood

Date: March 2019

Scale: 1:250,000

Projection/Coordinate System: UTM/MGA Zone 50

Figure: 7

**Myalup Primary
Industries Reserve
NatureMap Records
Reptiles of
Conservation
Significance**

5.5 BIRDS

5.5.1 Bird Assemblage

Thirty seven bird species were recorded during the field survey. Based on the literature review another 82 species may occur in the MPIR (119 in total) (see Appendix B), subject to suitable habitat being present.

During the fauna survey of a section of the DBNGP route 59 bird species were recorded (Harewood 2014). At Kemerton, 58 species were observed during the Level 2 survey carried out in 2009 (Harewood 2010). 360 Environment (2008) recorded 36 species at the Binningup Desalination Plant site, while Bamford (2008) and Western Wildlife (2008) reported 48 and 45 species respectively from sites near the Binningup town site. ENV (2009) reported 68 species at Yalgorup.

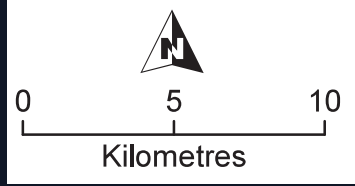
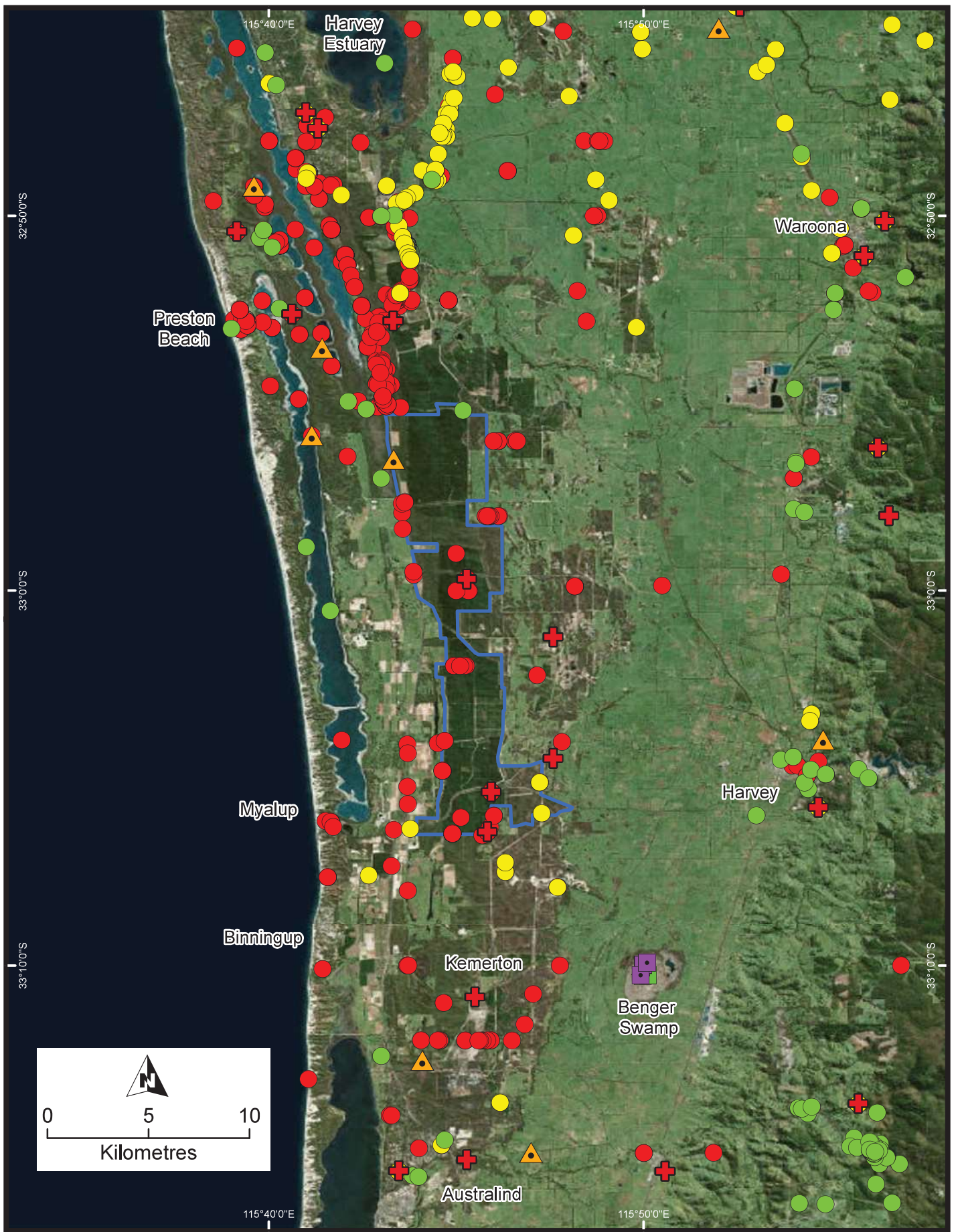
5.5.2 Birds of Conservation Significance

Seven bird species of conservation significance are considered as potentially occurring within the MPIR area, these being:

- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) – S2 (BC Act), Endangered (EPBC Act);
- Baudin's Black Cockatoo (*Calyptorhynchus latirostris*) – S2 (BC Act), Endangered (EPBC Act);
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – S3 (BC Act), Vulnerable (EPBC Act);
- Australasian Bittern (*Botaurus poiciloptilus*) – S2 (BC Act), Endangered (EPBC Act);
- Black Bittern (*Ixobrychus flavicollis*) – P2 (DBCAs Priority species);
- Australian Little Bittern (*Ixobrychus dubius*) – P4 (DBCAs Priority species); and
- Peregrine Falcon (*Falco peregrinus*) - S7 (BC Act).

There are numerous records of all three species of black cockatoos in the general area within the NatureMap database, with Carnaby's being the most commonly recorded species within the MPIR project area, possibly due to its liking for pine cones as a foraging resource. There are also several documented black cockatoo roost sites within the MPIR, though their current status is unknown (Figure 8).

Evidence of Carnaby's black cockatoo was found at several locations with the MPIR area in the form of chewed banksia and pine cones. The other two black species are also likely to frequent the area given the presence of suitable foraging habitat (e.g. marri, jarrah, sheoak, banksia). Black cockatoos also have the potential to breed in the area subject to forest and woodland areas containing large hollow bearing trees.



Legend

- MPIR - Project Area
- Australasian Bittern
- Little Bittern
- Peregrine Falcon
- Carnaby's Black Cockatoo
- Baudin's Black Cockatoo
- Forest Red-tailed Black Cockatoo
- Black Cockatoo Roost Site



Fauna Assessment
 Drawn: G. Harewood
 Date: March 2019
 Scale: 1:250,000
 Projection/Coordinate System: UTM/MGA Zone 50

Myalup Primary Industries Reserve
NatureMap Records
Birds of Conservation Significance

Excluding completely degraded areas (~299 ha), areas dominated by paperbark (vegetation units C2 and C3 - ~304 ha) and recently clear felled pine plantations (area unknown), almost all of the MPIR area can be regarded as containing foraging habitat of some type suitable for at least one species of black cockatoo that frequent the area. The areas of native vegetation representing foraging habitat for cockatoos includes forests and woodlands containing jarrah, marri and banksia (vegetation units A1 – A3, B1- B3, C1 and C3) which have a total area of about 2,463 ha within the MPIR (Figure 4a and 4b). Pine plantations (a foraging resource favoured by Carnaby's black cockatoo) make up about 4,000 ha of the MPIR though some areas do not currently contain any trees.

Both Carnaby's and the forest red-tailed black cockatoo were recorded in the nearby DBNGP fauna survey (Harewood 2014) while all three species of black cockatoo were recorded at Kemerton (Harewood 2010). Carnaby's black-cockatoo have previously been recorded during the Binningup Desalination Plant fauna surveys (360 Environmental 2008) and at Yalgorup (ENV 2009) while the forest red-tailed black-cockatoo was recorded by Western Wildlife at Binningup (Western Wildlife 2008). Carnaby's black-cockatoos were also recorded by Bamford (2008). Baudin's black cockatoo has also been recorded during fauna surveys at Yalgorup on several occasions (ENV 2009, ATA 1998). There are numerous other records of all three species in the general area (Figure 8).

Bitterns of any species have not previously been recorded with the MPIR (Figure 8) and there is limited suitable habitat (seasonally inundated wetland areas with dense vegetation) present. The probability of any of these species being present during the wetter months of the year is therefore probably low but without a detailed survey cannot be totally discounted.

The peregrine falcon is an uncommon species with a large home range. The MPIR contains suitable foraging and breeding habitat and the species may occur if only on rare occasions.

The peregrine falcon was recorded by 360 Environmental at the Binningup desalination plant site (360 Environment (2008)) and there are several other records of the species in the general area (Figure 8).

5.5.3 Regional Endemism, Distribution Limits and Rare Assemblages

The avifauna of the area is potentially comprised of 119 species. While most are relatively wide spread, not endemic to the area or at the limit of their distribution, the fact that a significant proportion of the Swan Coastal Plain is cleared makes the potential assemblage, as a whole, of significant local and possibly regional significance. In addition to the conservation significant species previously mentioned the subject sites are also potentially utilised by up to an estimated 40 bird species noted as declining in other parts of the Swan Coastal Plain (i.e. bush forever "decreaser" species). Eleven of these bird species were observed during the survey period.

The presence of decreaser species in an area can be of particular significance for the conservation of these bird species on the Swan Coastal Plain (Dell and Hyder 2009a).

Dell and Hyder (2009a) concluded, for the Dawesville-Binningup area, that the presence of high numbers of decreaser species is of particular significance for the conservation of these bird species on the Swan Coastal Plain as a whole given the high degree of clearing that has and is being undertaken. The more extensive and diverse tracts of habitats in the Dawesville to Binningup area therefore have great significance for bird conservation on the Swan Coastal Plain (Dell and Hyder 2009a).

Dell and Hyder (2009a) also state that even in those parts of Dawesville-Binningup area, where the native vegetation is fragmented by farmland, movement of birds between larger habitat areas may be facilitated by the use of ecological linkages connecting smaller areas of remnant vegetation to larger habitat areas, a comment relevant to the MPIR site which is located very near the Dawesville- Binningup assessment area.

5.6 NATIVE NON-VOLANT MAMMALS

5.6.1 Native Non-Volant Mammal Assemblage

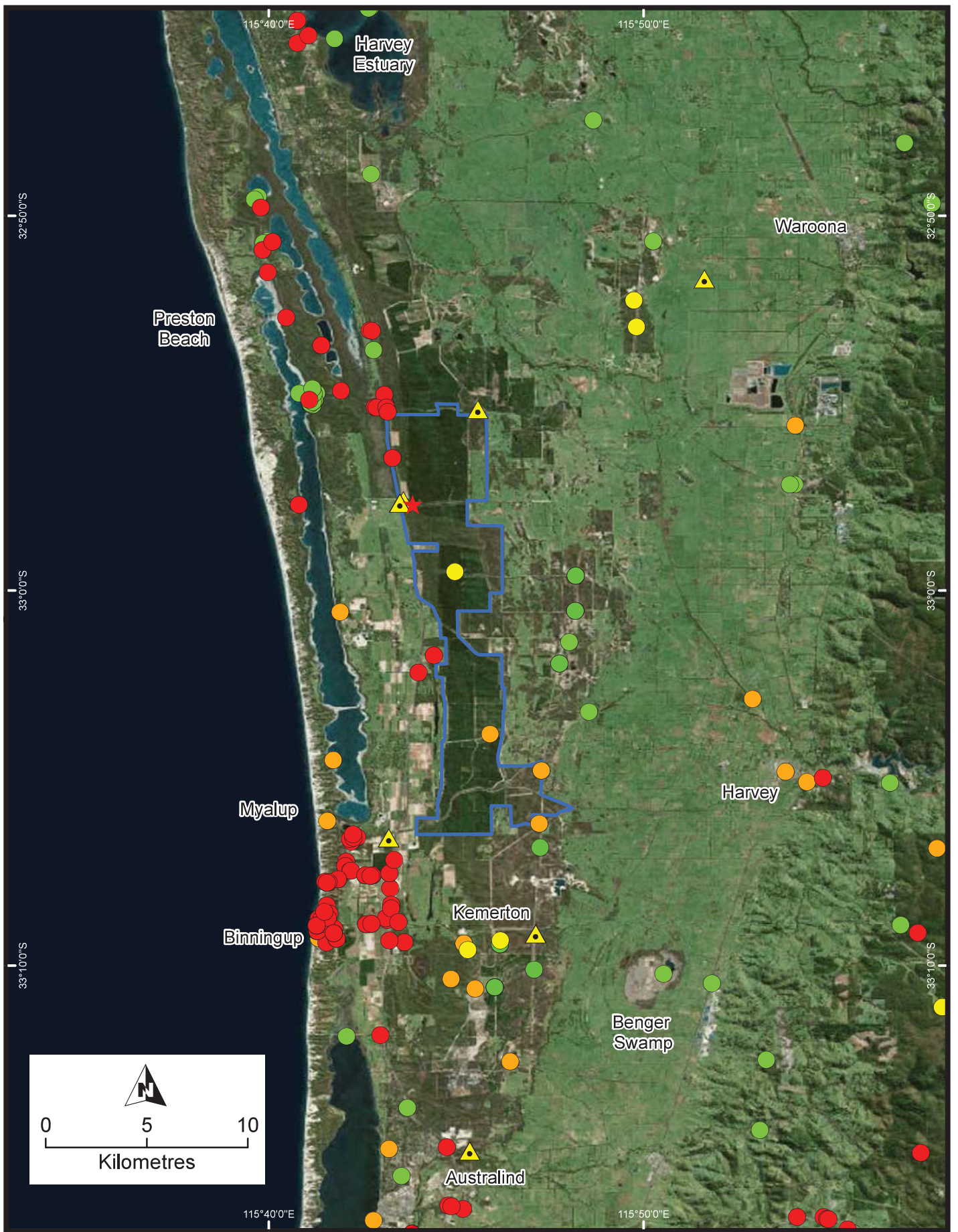
Three native, non-flying mammal species were observed/recorded during the field survey. Based on the literature review another five species may occur (eight in total), subject to suitable habitat being present. Nine introduced species may also frequent the MPIR project area.

The fauna survey of the DPNGP route recorded five native mammal species (Harewood 2014) while seven species were recorded within the Kemerton buffer zone (Harewood 2010). ENV (2009) reported four non-flying native mammal species at Yalgorup. 360 Environment (2008) recorded only three at the Binningup Desalination Plant site, while Bamford (2008) and Western Wildlife (2008) reported only two species in each instance from sites near the Binningup town site. Hyder and Dell (2009) reported eight species though this was from observations made during many separate surveys over six years.

5.6.2 Native Non-Volant Mammal of Conservation Significance

Four non-volant mammal species of conservation significance are considered as potentially occurring within the MPIR area, these being:

- Quenda (*Isoodon fusciventer*) – P4 (DBCA Priority species);
- South-western Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – S6 (BC Act);
- Western Ringtail Possum (*Pseudocheirus occidentalis*) - S1 (BC Act), Critically Endangered (EPBC Act); and
- Western Brush Wallaby (*Notamacropus irma*) - P4 (DBCA Priority species).



Legend

- MPIR - Project Area
- Western Ringtail Possum
- ★ WRP Drey & Scats December 2018

- South-western Brush-tailed Phascogale
- Western Brush Wallaby
- Quenda
- ▲ Western False Pipistrelle



Fauna Assessment
 Drawn: G. Harewood
 Date: March 2019
 Scale: 1:250,000

Myalup Primary Industries Reserve
NatureMap Records
Mammals of Conservation Significance

Evidence of the presence of the western ringtail possum was found at one location in the form of a drey and some scats (corner Bagieau Road and Forrest Highway) (Figure 9). The western ringtail possum is relatively common around the Binningup area and it is also relatively abundant along the sections of the lower Collie River. It does appear however to be much less common inland and north of these areas and previous opportunistic records and surveys east of the Forrest Highway have only detected small numbers at a few locations (Figure 9). It is therefore probably only present in relatively low densities at select locations within the MPIR.

Within the MPIR habitat potentially suitable for the western ringtail possum is represented by those units containing relatively dense and continuous midstorey vegetation (vegetation units A1-A3, B1-B3 and C4) which totals about 2,170 ha (Figures 4a and 4b). The western ringtail possums actual presence at specific locations would also be dependent on the plant species composition and age. While the WRPs are known to favour peppermint in some areas they also feed on the fruits, flowers and/or leaves of a wide range of other plant species including but not limited to jarrah, marri, WA christmas tree, woody pear, and some melaleucas.

All three of the other potential species are very likely to occur given the presence of suitable habitat and the fact they have been recorded in the general area in the past (Figure 9).

The quenda appears to be widespread in suitable habitat in this part of the coastal plain (Figure 9). During the fauna survey of the DBNGP route (Harewood 2014) it was captured at two trap sites and photographed at six of the ten camera trap sites. Evidence of its presence (diggings) was also noted at several wetlands. In previous surveys it has been recorded at Kemerton (Harewood 2010) and Yalgorup (ENV 2009) but was not observed at Binningup (360 Environmental 2008, Bamford 2008 and Western Wildlife 2008). Hyder and Dell (2009) did however record it at widespread locations in their survey area. This species presence/absence in any one area is determined to a significant degree by the presence/absence of dense ground cover.

Phascogales were also recorded during the DBNGP survey (Harewood 2014) and at Kemerton (Harewood 2009, 2010) (Figure 9) but it was not observed in any of the other nearby fauna surveys (e.g. Western Wildlife 2008, 360 Environmental 2008, Bamford 2008, ENV 2009, Hyder and Dell 2009). The Author has however observed the species in remnant vegetation during a night survey at the Binningup Desalination Plant in 2013.

The western brush wallaby was observed within the MPIR project area during the DBNGP fauna survey along Riverdale Road (Harewood 2014) (Figure 9). It has also been recorded at Kemerton (Harewood 2009, 2010). Hyder and Dell (2009) also report one sighting south of Myalup.

5.6.3 Regional Endemism, Distribution Limits and Rare Assemblages

As with the other fauna groups, while most species are relatively wide spread (albeit some rarer than others), not endemic or at the limit of their distribution, the fact that a

significant proportion of the Swan Coastal Plain is cleared makes the potential assemblage, as a whole, of significant local and possibly regional significance.

Hyder and Dell (2009) concluded that habitats within their Dawesville to Binningup survey area are of regional significance for mammals, particularly for those species and assemblages that have greatly reduced distributions or have declined in abundance elsewhere on the Swan Coastal Plain. This same conclusion can be applied to the assemblage present with the MPIR given its proximity the Dawesville/Binningup area, similar fauna assemblage and the presence of remnant native vegetation in an otherwise significantly cleared landscape.

5.7 BATS

5.7.1 Bat Assemblage

Nine species of bat are predicted to be present within MPIR (see Appendix B).

Harewood (2014) recorded all of the nine predicted bat species during the nearby survey of the DBNGP route and a total of eight species were recorded from within the Kemerton buffer zone (Harewood 2010). Bullen (2009) recorded seven species from between Dawesville and Binningup.

Other surveys in the area have recorded less species with ENV (2009), Bamford (2008), Bamford (2003) and 360 Environmental (2008) only detecting the presence of three species in each case.

5.7.2 Bats of Conservation Significance

The western false pipistrelle (*Falsistrellus mackenziei*), a Priority 4 species is listed as a potential species given it has been recorded in the area, including just with the MPIR, in the past (see Figure 9).

This species was recorded during the DBNGP fauna survey at two locations (Brunswick River and Kemerton Silica Sands) (Harewood 2014). It has also been recorded at Kemerton (Harewood 2010) and between Dawesville and Binningup at several localities (Bullen 2009). It was not recorded during the course of any other surveys used as main references.

5.7.3 Regional Endemism, Distribution Limits and Rare Assemblages

None of the predicted bat species are restricted specifically to this section of the coastal plain and so none can be considered endemic. The potential assemblage is unlikely to be considered unusual or rare given that most species are relatively common and widespread within the south west region and most are likely to be recorded at many locations.

The MPIR is however near the apparent northern limit of the western false pipistrelle range. The range of this species is reported as contracting southwards in recent times

and the retention of this species within the region is considered important for the biodiversity of the area (Bullen 2009).

5.8 INTRODUCED MAMMALS

Thirteen introduced mammal species occur or may occur within the MPIR, these being:

- Mosquito Fish (*Gambusia holbrooki*);
- Domestic Pigeon (*Columba livia*);
- Laughing Turtle-Dove (*Streptopelia senegalensis*);
- Laughing Kookaburra (*Dacelo novaeguineae*);
- House Mouse (*Mus musculus*);
- Black Rat (*Rattus rattus*);
- Cat (*Felis catus*);
- Dog (*Canus lupus familiaris*);
- Red Fox (*Vulpes Vulpes*);
- Rabbit (*Oryctolagus cuniculus*);
- Pig (*Sus scrofa*);
- European Cattle (*Bos Taurus*); and
- Horse (*Equus caballus*).

Three species of introduced fauna were recorded during the field reconnaissance survey these being the mosquito fish, the laughing kookaburra and the rabbit.

6. POTENTIAL IMPACTS AND CONSTRAINTS ON DEVELOPMENT

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

- Loss of vegetation/fauna habitat that may be used for foraging, breeding, roosting, or dispersal (includes loss of hollow bearing trees);
- Fragmentation of vegetation/fauna habitat which may restrict the movement of some fauna species;
- Modifications to surface hydrology, siltation of creek lines/wetlands;

- 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 due to increased traffic flow.

The potential impact on fauna species as a consequence of development of the MPIR will be dependent on each species population density and the quantity and quality of potential habitat that will be affected. Planning undertaken for the MPIR up to this point has however aimed to avoid the need to clear native vegetation with most development being positioned over areas of existing cleared land primarily in current use as pine plantations.

Stage 1 of the MPIR does not encompass any areas of native vegetation and therefore direct impacts on fauna and fauna habitat are likely to be minimal. Stages 2 and 3 do however contain some areas of native vegetation and so there is some potential for direct impact on fauna. At this stage however the exact location and extent of native vegetation clearing that will be undertaken has yet to be finalised and therefore it is not possible to quantify impacts.

Given the demonstrated presence of a range of fauna species of conservation significance, some of which are specially protected under state and federal law consideration of possible impacts (direct and indirect) and the legislative requirements which may result as a consequence will need to be taken into account during ongoing planning.

These will largely be related to the possible need to remove areas of native vegetation within the stage boundaries and also other associated activities such as the construction or upgrade of access roads and services. Indirect impacts will also need to be considered (e.g. impacts on water tables, use of insecticides). Potential impacts of specific projects within the MPIR (e.g. silviculture, horticulture and mining) may need to be assessed individually due to varying characteristics of each activity.

7. CONCLUSION

The Level 1 fauna assessment of the MPIR was undertaken for the purposes of delineating and characterising the fauna habitats and faunal assemblages present and to identify potential impacts.

With respect to native vertebrate fauna, 17 mammals (includes nine bat species), 116 bird, 37 reptile and nine frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the subject area at times. Thirteen species of introduced animals could also frequent the area.

Of the 181 native animals that are listed as potentially occurring in the area, seven are considered to be critically endangered, endangered, vulnerable or in need of special protection under State and/or Federal law. In addition, seven DBCA priority species have also been listed as potentially present. Three invertebrate species of conservation significance also have the potential to be present.

At this stage constraints on development within the MPIR which may result as a consequent of possible impacts on fauna species or their habitat would appear to be minimal given proposed works are largely positioned over existing cleared areas.

The exact location and nature of proposed development within the MPIR is however yet to be finalised. Ongoing planning will need to take into account the potential presence of some species of conservation significance and fauna in general so that any direct and indirect impacts can be avoided or minimised. Potential impacts of specific projects within the MPIR (e.g. silviculture, horticulture and mining) may need to be assessed individually due to varying characteristics of each activity. Management plans and protocols that aim to minimise impact on fauna and fauna habitat should be employed where relevant in each case.

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APPENDIX A

Conservation Categories

EPBC Act (1999) Threatened Fauna Categories

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

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

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

Wildlife Conservation (Specially Protected Fauna) Notice 2018 Categories

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

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

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

Western Australian DBCA Priority Fauna Categories

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

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

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

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

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

IUCN Red List Threatened Species Categories

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

Categories are summarized below.

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

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

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

APPENDIX B

Observed and Potential Fauna Listing

Observed and Potential Fauna Listing

Compiled by Greg Harewood - Jan 2019

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

Approximate centroid = 33.01645° and 115.74702°

A = Harewood, G. (2019), Fauna Assessment (Level 1), Myalup Primary Industries Reserve. Unpublished report for RPS.

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

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

D = ENV (2009), Clifton Beach Fauna Assessment. Unpublished report for Cape Bouvard Investments Pty Ltd.

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

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

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

H = Bamford Consulting Ecologists (2003), Fauna Values of Cape Bouvard Investment's Pty Ltd Land, Yalgorup. Unpublished report for RPS.

I = ATA (1998), Vertebrate Fauna. Lake Clifton Land Exchange Proposal. Unpublished report for Bouvard Investment's Pty Ltd.

J = DBCA (2019), NatureMap Database search. "By Circle" Centre - 115° 44' 49" E, 33° 00' 59" S; Accessed 31/01/2019.

Class	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
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Osteichthyes

Percichthyidae

Basses and Cods

Bostockia porosa

Nightfish

X

Nannopercidae

Pygmy Perches

Western Pygmy Perch

X

X

Poeciliidae

Livebearers

Gambusia holbrooki

Mosquito Fish

X

X

Introduced

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

Class	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
Amphibia												
Myobatrachidae Ground or Burrowing Frogs												
<i>Crinia georgiana</i>	Quacking Frog	LC	X									X
<i>Crinia glauerti</i>	Clicking Frog	LC	X									X
<i>Crinia insignifera</i>	Squelching Froglet	LC	X	X	X						X	X
<i>Geocrinia leai</i>	Ticking Frog	LC	X									X
<i>Heleioporus eyrei</i>	Moaning Frog	LC	X	X	X	X	X	X	X		X	X
<i>Limnodynastes dorsalis</i>	Western Banjo Frog	LC	X	X	X	X	X	X	X		X	X
<i>Pseudophryne guentheri</i>	Crawling Toadlet	LC	X			X						X
Hyllidae Tree or Water-Holding Frogs												
<i>Litoria adelaidensis</i>	Slender Tree Frog	LC	X	X	X	X	X		X	X	X	X
<i>Litoria moorei</i>	Motorbike Frog	LC	X	X	X	X	X	X	X	X		X
Reptilia												
Cheloniidae Side-necked Freshwater Turtles												
<i>Chelodina colliei</i>	SW Snake-necked Turtle	LC				X						X

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

Class		Conservation									
Family	Common Name	A	B	C	D	E	F	G	H	I	J
Species		Status									
Diplodactylidae											
Geckoes											
<i>Strophurus spinigerus</i>	Soft Spiny-tailed Gecko				X		X		X	X	X
Gekkonidae											
Geckoes											
<i>Christinus marmoratus</i>	Marbled Gecko		X	X	X	X	X	X	X	X	X
Pygopodidae											
Legless Lizards											
<i>Aprasia repens</i>	Sandplain Worm Lizard										X
<i>Delma fraseri</i>	Fraser's Legless Lizard				X	X	X			X	X
<i>Delma grayii</i>	Side-barred Delma				X						X
<i>Lialis burtonis</i>	Burton's Legless Lizard		X	X	X	X	X	X	X	X	X
<i>Pygopus lepidopodus</i>	Common Scaly Foot				X					X	X
Agamidae											
Dragon Lizards											
<i>Ctenophorus adelaidensis</i>	Southern Heath Dragon				X				X		X
<i>Pogona minor</i>	Western Bearded Dragon		X	X	X	X	X	X	X	X	X
Varanidae											
Monitor's or Goanna's											
<i>Varanus gouldii</i>	Sand Monitor		X	X	X		X				X
<i>Varanus rosenbergi</i>	Heath Monitor		X	X	X						X

WAWC Act Status - S1 to S7, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA Priority Status - P1 to P4, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bn = 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										
		A	B	C	D	E	F	G	H	I	J	
Scincidae Skinks												
<i>Acritoscincus trilineatum</i>	Southwestern Cool Skink		X	X	X	X					X	
<i>Cryptoblepharus buchananii</i>	Buchanan's Snake-eyed Skink	X	X	X	X	X			X			X
<i>Ctenotus australis</i>	Western Ctenotus			X	X	X			X			X
<i>Ctenotus fallens</i>	West Coast Ctenotus						X					X
<i>Ctenotus impar</i>	Odd-striped Ctenotus		X	X								X
<i>Ctenotus ora</i>	Coastal Plains Skink		X	X								X
<i>Egernia kingii</i>	King's Skink									X		
<i>Egernia napoleonis</i>	Salmon-bellied Skink		X	X	X				X	X		X
<i>Hemiergis quadrilineata</i>	Two-toed Mulch Skink		X	X	X	X			X	X		X
<i>Lerista elegans</i>	West Coast Four-toed Lerista		X	X	X	X			X	X		X
<i>Lerista lineata</i>	Perth Lined Lerista			X	X	X			X	X		X
<i>Lerista lineopunctulata</i>	Line-spotted Robust Lerista								X			
<i>Menetia greyii</i>	Dwarf Skink		X	X	X	X			X	X		X
<i>Morethia lineocellata</i>	West Coast Pale-flecked Morethia		X	X	X	X			X	X		X
<i>Morethia obscura</i>	Shrubland Pale-flecked Morethia				X							X
<i>Tiliqua rugosa</i>	Bobtail		X	X	X	X			X	X		X

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

Class	Common Name	Conservation Status									
Family	Species	A	B	C	D	E	F	G	H	I	J
Typhlopidae Blind Snakes											
	<i>Anilius australis</i>		X	X	X	X	X			X	
Boidae Pythons, Boas											
	<i>Morelia spilota imbricata</i>			X							
Elapidae Elapid Snakes											
	<i>Demansia psammophis reticulata</i>			X						X	
	<i>Echiopsis curta</i>							X			
	<i>Neelaps bimaculatus</i>			X	X	X	X				X
	<i>Notechis scutatus</i>		X	X			X		X		X
	<i>Parasuta gouldii</i>			X	X	X			X	X	X
	<i>Pseudonaja affinis</i>		X	X	X	X	X		X	X	X
	<i>Simoselaps bertholdi</i>		X		X	X	X		X	X	X
Aves											
Casuariidae Emus, Cassowaries											
	<i>Dromaius novaehollandiae</i>		X	X	X	X			X	X	X

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

Class Family Species	Common Name	Conservation Status																		
		A	B	C	D	E	F	G	H	I	J									
Phasianidae Quails, Pheasants																				
<i>Coturnix pectoralis</i>	Stubble Quail																			X
<i>Coturnix ypsilophora</i>	Brown Quail																			X
Anatidae Geese, Swans, Ducks																				
<i>Anas gracilis</i>	Grey Teal																			X
<i>Anas superciliosa</i>	Pacific Black Duck																			X
<i>Aythya australis</i>	Hardhead																			X
<i>Chenonetta jubata</i>	Australian Wood Duck																			X
<i>Cygnus atratus</i>	Black Swan																			X
<i>Tadorna tadornoides</i>	Australian Shelduck																			X
Podicipedidae Grebes																				
<i>Polyocephalus poliocephalus</i>	Hoary-headed Grebe																			X
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe																			X

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

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
Phalacrocoracidae Cormorants												
<i>Phalacrocorax carbo</i>	Great Cormorant	LC										X
<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant	LC	X									X
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	LC	X					X				X
<i>Phalacrocorax varius</i>	Pied Cormorant	LC				X				X		X
Ardeidae Herons, Egrets, Bitterns												
<i>Ardea alba</i>	Great Egret	CA JA							X			
<i>Ardea garzetta</i>	Little Egret	LC										
<i>Ardea ibis</i>	Cattle Egret	CA JA										X
<i>Ardea novaehollandiae</i>	White-faced Heron	LC	X	X	X	X			X			X
<i>Ardea pacifica</i>	White-necked Heron	LC	X									X
<i>Botaurus poiciloptilus</i>	Australasian Bittern	S2 EN Bp EN C1										X
<i>Ixobrychus dubius</i>	Australian Little Bittern	P4 Bp LC										
<i>Ixobrychus flavicollis</i>	Black Bittern (SW pop)	P2 Bp LC										
<i>Nycticorax caledonicus</i>	Rufous Night Heron	Bp LC							X			X

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Class Family Species	Common Name	Conservation Status										
		A	B	C	D	E	F	G	H	I	J	
Threskiornithidae Ibises, Spoonbills												
<i>Platalea flavipes</i>	Yellow-billed Spoonbill		X									X
<i>Threskiornis molucca</i>	Australian White Ibis		X	X								
<i>Threskiornis spinicollis</i>	Straw-necked Ibis	X	X	X			X					X
Accipitridae Kites, Goshawks, Eagles, Harriers												
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk				X					X		X
<i>Accipiter fasciatus</i>	Brown Goshawk			X				X				X
<i>Aquila audax</i>	Wedge-tailed Eagle		X	X	X			X				X
<i>Aquila morphnoides</i>	Little Eagle							X			X	
<i>Circus approximans</i>	Swamp Harrier			X	X							X
<i>Elanus caeruleus</i>	Black-shouldered Kite			X					X			X
<i>Haliastur sphenurus</i>	Whistling Kite		X	X	X					X		X
<i>Hamirostra isura</i>	Square-tailed Kite			X				X			X	X

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Class		Common Name		Conservation Status																
Family	Species	A	B	C	D	E	F	G	H	I	J									
Falconidae	Falcons																			
	<i>Falco berigora</i>				X				X	X	X									
	<i>Falco cenchroides</i>																			
	<i>Falco longipennis</i>																			
	<i>Falco peregrinus</i>																			
Rallidae	Rails, Crakes, Swamphens, Coots																			
	<i>Fulica atra</i>																			
	<i>Gallinula tenebrosa</i>																			
	<i>Gallirallus philippensis</i>																			
	<i>Porphyrio porphyrio</i>																			
	<i>Porzana pusilla</i>																			
	<i>Porzana tabuensis</i>																			
Turnicidae	Button-quails																			
	<i>Turnix varia</i>																			

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
			Charadriidae Lapwings, Plovers, Dotterels									
<i>Charadrius melanops</i>	Black-fronted Dotterel	LC										
<i>Vanellus tricolor</i>	Banded Lapwing	LC										X
Columbidae Pigeons, Doves												
<i>Columba livia</i>	Domestic Pigeon	Introduced										
<i>Ocyphaps lophotes</i>	Crested Pigeon	LC	X	X	X		X		X			X
<i>Phaps chalcoptera</i>	Common Bronzewing	Bh LC	X	X	X	X	X	X	X	X	X	X
<i>Phaps elegans</i>	Brush Bronzewing	Bh LC										X
<i>Streptopelia senegalensis</i>	Laughing Turtle-Dove	Introduced				X	X		X			X

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
			Psittacidae Parrots									
<i>Cacatua roseicapilla</i>	Galah	LC	X	X	X	X	X	X	X	X	X	X
<i>Cacatua sanguinea</i>	Little Corella	LC			X		X					X
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo	S3 VU Bp LC	X	X	X		X					X
<i>Calyptorhynchus baudinii</i>	Baudin's Black-Cockatoo	S2 EN Bp EN A3cde			X	X					X	X
<i>Calyptorhynchus latirostris</i>	Carnaby's Black-Cockatoo	S2 EN Bp EN A2bcde	X	X	X	X	X	X	X	X	X	X
<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet	LC				X	X		X			
<i>Neophema elegans</i>	Elegant Parrot	LC	X	X	X	X	X					X
<i>Platyercus icterotis icterotis</i>	Western Rosella (western ssp)	Bp LC										
<i>Platyercus spurius</i>	Red-capped Parrot	LC	X	X	X	X	X	X	X	X	X	X
<i>Platyercus zonarius</i>	Australian Ringneck	LC	X	X	X	X	X	X	X	X	X	X
<i>Polytelis anthopeplus</i>	Regent Parrot	LC	X	X	X	X	X		X	X		X
Cuculidae Parasitic Cuckoos												
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo	LC			X	X	X				X	X
<i>Chrysococcyx basalis</i>	Horsfield's Bronze Cuckoo	LC			X							X
<i>Chrysococcyx lucidus</i>	Shining Bronze Cuckoo	LC		X	X	X	X	X	X	X	X	X
<i>Cucullus pallidus</i>	Pallid Cuckoo	LC				X						X

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Class	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
Strigidae Hawk Owls												
<i>Ninox novaeseelandiae</i>	Boobook Owl	LC	X	X	X	X	X	X	X	X		
Tytonidae Barn Owls												
<i>Tyto alba</i>	Barn Owl	LC							X			X
Podargidae Frogmouths												
<i>Podargus strigoides</i>	Tawny Frogmouth	LC		X			X		X			X
Caprimulgidae Nightjars												
<i>Eurostopodus argus</i>	Spotted Nightjar	LC										X
Aegothelidae Owlet-nightjars												
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	LC				X						X
Halcyonidae Tree Kingfishers												
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Introduced	X	X	X	X	X	X	X	X	X	X
<i>Todiramphus sanctus</i>	Sacred Kingfisher	LC	X	X	X	X	X	X	X	X		X
Meropidae Bee-eaters												
<i>Merops ornatus</i>	Rainbow Bee-eater	JA LC	X	X	X	X	X	X	X	X		X

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
			Maluridae Fairy Wrens, GrassWrens									
<i>Malurus splendens</i>	Splendid Fairy-wren	Bh LC	X	X	X	X	X	X	X	X	X	X
Acanthizidae Thornbills, Geryones, Fieldwrens & Whitefaces												
<i>Acanthiza apicalis</i>	Broad-tailed Thornbill	Bh LC	X	X	X	X	X	X	X	X	X	X
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	Bh LC	X	X	X	X	X			X		X
<i>Acanthiza inornata</i>	Western Thornbill	Bh LC										X
<i>Gerygone fusca</i>	Western Gerygone	LC	X	X	X	X	X	X	X	X		X
<i>Sericornis frontalis</i>	White-browed Scrubwren	Bh LC	X	X	X	X	X	X	X	X	X	X
<i>Smicromis brevirostris</i>	Weebill	Bh LC	X	X	X	X	X	X	X	X	X	X
Pardalotidae Pardalotes												
<i>Pardalotus punctatus</i>	Spotted Pardalote	LC		X							X	X
<i>Pardalotus striatus</i>	Striated Pardalote	LC	X	X	X	X	X	X	X	X	X	X

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Class		Common Name		Conservation Status												
Family	Species	A	B	C	D	E	F	G	H	I	J					
Meliphagidae	Honeyeaters, Chats															
	<i>Acanthorhynchus superciliosus</i>		X	X												X
	<i>Anthochaera carunculata</i>	X	X	X	X	X	X	X	X	X	X					X
	<i>Anthochaera lunulata</i>					X										
	<i>Epthianura albifrons</i>				X											X
	<i>Lichenostomus virescens</i>				X	X	X	X	X	X						X
	<i>Lichmera indistincta</i>		X	X	X	X	X	X	X	X						X
	<i>Phylidonyris melanops</i>									X						
	<i>Phylidonyris nigra</i>															
	<i>Phylidonyris novaehollandiae</i>				X	X	X	X	X	X	X					X
Petroicidae	Australian Robins															
	<i>Eopsaltria australis</i>							X	X							X
	<i>Petroica multicolor</i>							X	X	X						X
Neosittidae	Sittellas															
	<i>Daphoenositta chrysoptera</i>														X	X

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

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Class		Conservation									
Family	Common Name	A	B	C	D	E	F	G	H	I	J
Species	Status										
Cracticidae Currawongs, Magpies & Butcherbirds											
<i>Cracticus fibicen</i>	Australian Magpie LC	X	X	X	X	X	X	X	X	X	X
<i>Cracticus forquatus</i>	Grey Butcherbird LC	X	X	X	X	X	X	X	X	X	X
<i>Strepera versicolor</i>	Grey Currawong Bp LC			X							X
Corvidae Ravens, Crows											
<i>Corvus coronoides</i>	Australian Raven LC	X	X	X	X	X	X	X	X	X	X
Motacillidae Old World Pipits, Wagtails											
<i>Anthus australis</i>	Australian Pipit LC	X		X	X						X
Dicaeidae Flowerpeckers											
<i>Dicaeum hirundinaceum</i>	Mistletoebird LC									X	X
Hirundinidae Swallows, Martins											
<i>Hirundo neoxena</i>	Welcome Swallow LC	X	X	X	X	X	X	X	X	X	X
<i>Hirundo nigricans</i>	Tree Martin LC	X	X	X	X	X	X	X	X	X	X

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Class	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
Sylviidae Old World Warblers												
<i>Acrocephalus australis</i>	Australian Reed Warbler	LC										X
<i>Cincloramphus cruralis</i>	Brown Songlark	LC				X						
<i>Cincloramphus mathewsi</i>	Rufous Songlark	LC	X									
Zosteropidae White-eyes												
<i>Zosterops lateralis</i>	Silvereye	LC	X	X	X	X	X	X	X	X	X	X
Mammalia												
Tachyglossidae Echidnas												
<i>Tachyglossus aculeatus</i>	Echidna	LC				X						
Dasyuridae Carnivorous Marsupials												
<i>Phascogale tapoatafa wambenger</i>	South-western Brush-tailed Phascogale S6 NT		X		X							X
Peramelidae Bandicoots												
<i>Isoodon fusciventer</i>	Quenda	P4 LC	X	X	X	X						X
Phalangeridae Brush-tail Possums, Cuscuses												
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	LC	X	X	X	X	X	X	X	X	X	X

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Class		Conservation									
Family	Common Name	A	B	C	D	E	F	G	H	I	J
Species	Status										
Vespertilionidae											
Ordinary Bats											
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	LC	X	X	X	X	X	X	X	X	X
<i>Chalinolobus morio</i>	Chocolate Wattled Bat	LC	X	X	X	X	X	X	X	X	X
<i>Falstirellus mackenziei</i>	Western False Pipistrelle	P4 NT	X	X	X	X	X	X	X	X	X
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	LC	X	X	X	X	X	X	X	X	X
<i>Nyctophilus gouldi</i>	Gould's Long-eared Bat	LC	X	X	X	X	X	X	X	X	X
<i>Nyctophilus major major</i>	Western Long-eared Bat	LC	X	X	X	X	X	X	X	X	X
<i>Vespadelus regulus</i>	Southern Forest Bat	LC	X	X	X	X	X	X	X	X	X
Muridae											
Rats, Mice											
<i>Mus musculus</i>	House Mouse	Introduced	X	X	X	X	X	X	X	X	X
<i>Rattus rattus</i>	Black Rat	Introduced	X	X	X	X	X	X	X	X	X
Canidae											
Dogs, Foxes											
<i>Canis lupus familiaris</i>	Dog	Introduced	X	X	X	X	X	X	X	X	X
<i>Vulpes vulpes</i>	Red Fox	Introduced	X	X	X	X	X	X	X	X	X
Felidae											
Cats											
<i>Felis catus</i>	Cat	Introduced	X	X	X	X	X	X	X	X	X

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Class	Common Name	Conservation Status	A	B	C	D	E	F	G	H	I	J
Equidae Horses												
	<i>Equus caballus</i>	Introduced		X								
Bovidae Horned Ruminants												
	<i>Bos taurus</i>	Introduced		X								
Suidae Pigs												
	<i>Sus scrofa</i>	Introduced		X	X	X						X
Leporidae Rabbits, Hares												
	<i>Oryctolagus cuniculus</i>	Introduced	X	X	X	X	X	X	X	X	X	X

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APPENDIX C

DBCA & EPBC Database Search Results

NatureMap - Myalup Primary Industries Reserve

Created By Greg Harewood on 31/01/2019

Kingdom Animalia
 Current Names Only Yes
 Core Datasets Only Yes
 Method 'By Circle'
 Centre 115° 44' 49" E, 33° 00' 59" S
 Buffer 20km
 Group By Species Group

Species Group	Species	Records
Amphibian	9	312
Bird	207	8020
Fish	13	95
Invertebrate	102	421
Mammal	34	1018
Reptile	52	839
TOTAL	417	10705

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Amphibian				
1.	25398 <i>Crinia georgiana</i> (Quacking Frog)			
2.	25399 <i>Crinia glauerti</i> (Clicking Frog)			
3.	25400 <i>Crinia insignifera</i> (Squelching Froglet)			
4.	25404 <i>Geocrinia leai</i> (Ticking Frog)			
5.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
6.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
7.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
8.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
9.	25433 <i>Pseudophryne guentheri</i> (Crawling Toadlet)			
Bird				
10.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
11.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
12.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
13.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
14.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
15.	24281 <i>Accipiter cirrocephalus</i> subsp. <i>cirrocephalus</i> (Collared Sparrowhawk)			
16.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
17.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
18.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
19.	25544 <i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
20.	24301 <i>Aegotheles cristatus</i> subsp. <i>cristatus</i> (Australian Owlet-nightjar)			
21.	24312 <i>Anas gracilis</i> (Grey Teal)			
22.	24313 <i>Anas platyrhynchos</i> (Mallard)			
23.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
24.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
25.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
26.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
27.	25670 <i>Anthus australis</i> (Australian Pipit)			
28.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
29.	25558 <i>Ardea ibis</i> (Cattle Egret)			
30.	41324 <i>Ardea modesta</i> (great egret, white egret)			
31.	24340 <i>Ardea novaehollandiae</i> (White-faced Heron)			
32.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
33.	25560 <i>Ardea sacra</i> (Eastern Reef Egret, Eastern Reef Heron)			
34.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
35.	25736 <i>Arenaria interpres</i> (Ruddy Turnstone)		IA	
36.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
37.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
38.	24318 <i>Aythya australis</i> (Hardhead)			
39.	<i>Barnardius zonarius</i>			
40.	24319 <i>Biziura lobata</i> (Musk Duck)			
41.	24345 <i>Botaurus poiciloptilus</i> (Australasian Bittern)		□	
42.	24721 <i>Cacatua galerita</i> subsp. <i>galerita</i> (Sulphur-crested Cockatoo)	Y		
43.	25715 <i>Cacatua roseicapilla</i> (Galah)			
44.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
45.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
46.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
47.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
48.	24780 <i>Calidris alba</i> (Sanderling)		IA	
49.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		□	
50.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
51.	24790 <i>Calidris tenuirostris</i> (Great Knot)		□	
52.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
53.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black Cockatoo)		□	
54.	24733 <i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)		□	
55.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)		□	
56.	48400 <i>Calyptorhynchus</i> sp. (white-tailed black cockatoo)		□	
57.	25573 <i>Charadrius bicinctus</i> (Double-banded Plover)		IA	
58.	25575 <i>Charadrius leschenaultii</i> (Greater Sand Plover)		□	
59.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
60.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
61.	<i>Chroicocephalus novaehollandiae</i>			
62.	24431 <i>Chrysococcyx basalis</i> (Horsfield's Bronze Cuckoo)			
63.	25601 <i>Chrysococcyx lucidus</i> (Shining Bronze Cuckoo)			
64.	24432 <i>Chrysococcyx lucidus</i> subsp. <i>plagosus</i> (Shining Bronze Cuckoo)			
65.	24288 <i>Circus approximans</i> (Swamp Harrier)			
66.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
67.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
68.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
69.	24613 <i>Colluricincla harmonica</i> subsp. <i>rufiventris</i> (Grey Shrike-thrush)			
70.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
71.	24362 <i>Coracina novaehollandiae</i> subsp. <i>novaehollandiae</i> (Black-faced Cuckoo-shrike)			
72.	25592 <i>Corvus coronoides</i> (Australian Raven)			
73.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			
74.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
75.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
76.	24422 <i>Cracticus tibicen</i> subsp. <i>dorsalis</i> (White-backed Magpie)			
77.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
78.	24322 <i>Cygnus atratus</i> (Black Swan)			
79.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
80.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
81.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
82.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
83.	<i>Egretta garzetta</i>			
84.	<i>Egretta novaehollandiae</i>			
85.	<i>Elanus axillaris</i>			
86.	24290 <i>Elanus caeruleus</i> subsp. <i>axillaris</i> (Australian Black-shouldered Kite)			
87.	47937 <i>Euseyonis melanops</i> (Black-fronted Dotterel)			
88.	<i>Eolophus roseicapillus</i>			
89.	24651 <i>Eopsaltria australis</i> subsp. <i>griseogularis</i> (Western Yellow Robin)			
90.	24567 <i>Epthianura albifrons</i> (White-fronted Chat)			
91.	24379 <i>Erythronyx cinctus</i> (Red-kneed Dotterel)			
92.	25746 <i>Eudyptula minor</i> (Little Penguin)			
93.	24818 <i>Eudyptula minor</i> subsp. <i>novaehollandiae</i> (Little Penguin)			
94.	24368 <i>Eurostopodus argus</i> (Spotted Nightjar)			
95.	25621 <i>Falco berigora</i> (Brown Falcon)			
96.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
97.	24472 <i>Falco cenchroides</i> subsp. <i>cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
98.	25623 <i>Falco longipennis</i> (Australian Hobby)			
99.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
100.	25727 <i>Fulica atra</i> (Eurasian Coot)			
101.	24761 <i>Fulica atra</i> subsp. <i>australis</i> (Eurasian Coot)			
102.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
103.	24763 <i>Gallinula tenebrosa</i> subsp. <i>tenebrosa</i> (Dusky Moorhen)			
104.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			

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105.	24765 <i>Gallirallus philippensis</i> subsp. <i>mellori</i> (Buff-banded Rail)			
106.	42314 <i>Gavicalis virescens</i> (Singing Honeyeater)			
107.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
108.	24481 <i>Glareola maldivarum</i> (Oriental Pratincole)		IA	
109.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
110.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			
111.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
112.	24295 <i>Haliastur spheurnus</i> (Whistling Kite)			
113.	24296 <i>Hamirostra isura</i> (Square-tailed Kite)			
114.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
115.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
116.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
117.	48587 <i>Hydroprogne caspia</i> (Caspian Tern)		IA	
118.	47975 <i>Ixobrychus dubius</i> (Australian Little Bittern)		P4	
119.	24511 <i>Larus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Silver Gull)			
120.	25638 <i>Larus pacificus</i> (Pacific Gull)			
121.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
122.	<i>Lophoictinia isura</i>			
123.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
124.	25650 <i>Malurus elegans</i> (Red-winged Fairy-wren)			
125.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
126.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
127.	25758 <i>Megalurus gramineus</i> (Little Grassbird)			
128.	25663 <i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
129.	24586 <i>Melithreptus brevirostris</i> subsp. <i>leucogenys</i> (Brown-headed Honeyeater)			
130.	24587 <i>Melithreptus chloropsis</i> (Western White-naped Honeyeater)			
131.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
132.	<i>Microcarbo melanoleucos</i>			
133.	25693 <i>Microeca fascians</i> (Jacky Winter)			
134.	25610 <i>Myiagra inquieta</i> (Restless Flycatcher)			
135.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
136.	24798 <i>Numenius madagascariensis</i> (Eastern Curlew)		□	
137.	25742 <i>Numenius phaeopus</i> (Whimbrel)		IA	
138.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
139.	24497 <i>Oceanites oceanicus</i> (Wilson's Storm-petrel)		IA	
140.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
141.	41347 <i>Onychoprion anaethetus</i> (Bridled Tern)		IA	
142.	24328 <i>Oxyura australis</i> (Blue-billed Duck)		P4	
143.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
144.	24624 <i>Pachycephala rufiventris</i> subsp. <i>rufiventris</i> (Rufous Whistler)			
145.	24692 <i>Pachyptila belcheri</i> (Slender-billed Prion)			
146.	24693 <i>Pachyptila desolata</i> (Antarctic Prion)			
147.	25707 <i>Pachyptila salvini</i> (Salvin's Prion)			
148.	24697 <i>Pachyptila vittata</i> (Broad-billed Prion)			
149.	48591 <i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
150.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
151.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
152.	24630 <i>Pardalotus striatus</i> subsp. <i>westraliensis</i> (Striated Pardalote)			
153.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
154.	48060 <i>Petrochelidon ariel</i> (Fairy Martin)			
155.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
156.	48066 <i>Petroica boodang</i> (Scarlet Robin)			
157.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
158.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
159.	24664 <i>Phalacrocorax carbo</i> subsp. <i>novaehollandiae</i> (Great Cormorant)			
160.	25698 <i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
161.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
162.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
163.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
164.	25587 <i>Phaps elegans</i> (Brush Bronzewing)			
165.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
166.	24841 <i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
167.	25720 <i>Platycercus icterotis</i> (Western Rosella)			
168.	24747 <i>Platycercus spurius</i> (Red-capped Parrot)			
169.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
170.	24750 <i>Platycercus zonarius</i> subsp. <i>semitorquatus</i> (Twenty-eight Parrot)			
171.	24843 <i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
172.	24383 <i>Pluvialis squatarola</i> (Grey Plover)		IA	
173.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
174.	24679 <i>Podargus strigoides</i> subsp. <i>brachypterus</i> (Tawny Frogmouth)			

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175.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
176.	24681 <i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
177.	25722 <i>Polytelis anthopeplus</i> (Regent Parrot)			
178.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
179.	24767 <i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)			
180.	24769 <i>Porzana fluminea</i> (Australian Spotted Crake)			
181.	25732 <i>Porzana pusilla</i> (Baillon's Crake)			
182.	24770 <i>Porzana pusilla</i> subsp. <i>palustris</i> (Baillon's Crake)			
183.	24771 <i>Porzana tabuensis</i> (Spotless Crake)			
184.	<i>Purpureicephalus spurius</i>			
185.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
186.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
187.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
188.	24454 <i>Rhipidura leucophrys</i> subsp. <i>leucophrys</i> (Willie Wagtail)			
189.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
190.	24279 <i>Sericornis frontalis</i> subsp. <i>maculatus</i> (White-browed Scrubwren)			
191.	30948 <i>Smicromis brevirostris</i> (Weebill)			
192.	24645 <i>Stagonopleura oculata</i> (Red-eared Firetail)			
193.	24522 <i>Sterna bergii</i> (Crested Tern)			
194.	48594 <i>Sternula nereis</i> (Fairy Tern)			
195.	24329 <i>Stictonetta naevosa</i> (Freckled Duck)			
196.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
197.	25589 <i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
198.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
199.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
200.	24682 <i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
201.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
202.	34007 <i>Thalassarche chlororhynchos</i> (Atlantic Yellow-nosed Albatross)		□	
203.	48597 <i>Thalasseus bergii</i> (Crested Tern)		IA	
204.	48135 <i>Thinornis rubricollis</i> (Hooded Plover, Hooded Dotterel)		P4	
205.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
206.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
207.	48141 <i>Tribonyx ventralis</i> (Black-tailed Native-hen)			
208.	24803 <i>Tringa brevipes</i> (Grey-tailed Tattler)		P4	
209.	24806 <i>Tringa glareola</i> (Wood Sandpiper)		IA	
210.	24808 <i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	
211.	48147 <i>Turnix varius</i> (Painted Button-quail)			
212.	24852 <i>Tyto alba</i> subsp. <i>delicatula</i> (Barn Owl)			
213.	24855 <i>Tyto novaehollandiae</i> subsp. <i>novaehollandiae</i> (Masked Owl (southwest))		P3	
214.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
215.	41351 <i>Xenus cinereus</i> (Terek Sandpiper)		IA	
216.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			
ish				
217.	<i>Carassius auratus</i>			
218.	34031 <i>Carcharodon carcharias</i> (Great White Shark)		□	
219.	<i>Cynoglossus broadhursti</i>			
220.	<i>Edelia vittata</i>			
221.	<i>Eubalichthys caeruleoguttatus</i>			
222.	34028 <i>Galaxias occidentalis</i> (Western Minnow)			
223.	34027 <i>Galaxiella nigrostriata</i> (Black-stripe Minnow, black-striped dwarf galaxias)		□	
224.	<i>Gambusia affinis</i>			
225.	34030 <i>Geotria australis</i> (Pouched Lamprey)		P3	
226.	<i>Nannoperca vittata</i>			
227.	<i>Pegasus volitans</i>			
228.	<i>Pseudogobius olorum</i>			
229.	<i>Siphonognathus argyrophanes</i>			
Invertebrate				
230.	<i>Acariformes</i> sp.			
231.	<i>Aeshnidae</i> sp.			
232.	<i>Aganippe raphiduca</i>			
233.	<i>Aname mainae</i>			
234.	<i>Aname tepperi</i>			
235.	<i>Arachnura higginsi</i>			
236.	<i>Araneus cyphoxis</i>			
237.	<i>Araneus eburniventris</i>			
238.	<i>Araneus senicaudatus</i>			
239.	<i>Argiope protensa</i>			
240.	<i>Arkys walckenaeri</i>			

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241.	<i>Austracantha minax</i>			
242.	<i>Backobourkia heroine</i>			
243.	<i>Baetidae</i> sp.			
244.	<i>Caenidae</i> sp.			
245.	<i>Calamoecia clitellata</i>			
246.	<i>Ceinidae</i> sp.			
247.	<i>Celaenia excavata</i>			
248.	<i>Ceratopogonidae</i> sp.			
249.	<i>Cercophonius sulcatus</i>			
250.	33939 <i>Cherax cainii</i> (Marron)			
251.	<i>Cherax destructor</i>			
252.	<i>Cherax quinquecarinatus</i>			
253.	<i>Chironominae</i> sp.			
254.	<i>Coenagrionidae</i> sp.			
255.	<i>Corduliidae</i> sp.			
256.	<i>Corixidae</i> sp.			
257.	<i>Cormocephalus aurantiipes</i>			
258.	<i>Culicidae</i> sp.			
259.	<i>Dugesidae</i> sp.			
260.	<i>Dytiscidae</i> sp.			
261.	<i>Ecnomidae</i> sp.			
262.	<i>Empididae</i> sp.			
263.	<i>Ephydriidae</i> sp.			
264.	<i>Eriophora biapicata</i>			
265.	<i>Erpobdellidae</i> sp.			
266.	<i>Ethmostigmus rubripes</i>			
267.	<i>Geogarypus taylori</i>			
268.	<i>Glossiphoniidae</i> sp.			
269.	<i>Gomphidae</i> sp.			
270.	<i>Gripopterygidae</i> sp.			
271.	<i>Gyrinidae</i> sp.			
272.	<i>Hebridae</i> sp.			
273.	<i>Hemicorduliidae</i> sp.			
274.	<i>Hoggicosa castanea</i>			
275.	<i>Hoggicosa storri</i>			
276.	<i>Hydraenidae</i> sp.			
277.	<i>Hydrobiosidae</i> sp.			
278.	<i>Hydrophilidae</i> sp.			
279.	<i>Hydropsychidae</i> sp.			
280.	<i>Hydroptilidae</i> sp.			
281.	<i>Hyriidae</i> sp.			
282.	<i>Idiommatia blackwalli</i>			
283.	48935 <i>Idiosoma sigillatum</i> (Swan Coastal Plain shield-backed trapdoor spider)		P3	
284.	<i>Isopeda leishmanni</i>			
285.	<i>Ixodes australiensis</i>			
286.	<i>Lampona cylindrata</i>			
287.	<i>Latrodectus hasseltii</i>			
288.	<i>Leptoceridae</i> sp.			
289.	<i>Leptophlebiidae</i> sp.			
290.	<i>Libellulidae</i> sp.			
291.	<i>Lymnaeidae</i> sp.			
292.	<i>Maratus pavonis</i>			
293.	<i>Mesoveliidae</i> sp.			
294.	<i>Missulena granulosa</i>			
295.	<i>Missulena occatoria</i>			
296.	<i>Nematoda</i> sp.			
297.	<i>Nephila edulis</i>			
298.	<i>Nicodamus mainae</i>			
299.	<i>Notonectidae</i> sp.			
300.	<i>Nunciella aspera</i>			
301.	<i>Oecobius navus</i>			
302.	<i>Oligochaeta</i> sp.			
303.	<i>Orthoclaeniinae</i> sp.			
304.	<i>Palaemonidae</i> sp.			
305.	<i>Parastacidae</i> sp.			
306.	<i>Pentastemon intermedium</i>			
307.	<i>Perthiidae</i> sp.			
308.	<i>Physidae</i> sp.			
309.	<i>Pinkfloydia harveii</i>			
310.	<i>Raveniella peckorum</i>			

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311.	<i>Richardsonianidae</i> sp.			
312.	<i>Simuliidae</i> sp.			
313.	<i>Sphaeriidae</i> sp.			
314.	<i>Staphylinidae</i> sp.			
315.	<i>Steatoda capensis</i>			
316.	<i>Steatoda grossa</i>			
317.	<i>Supunna picta</i>			
318.	33992 <i>Synemon gratiosa</i> (Graceful Sunmoth)		P4	
319.	<i>Synthemistidae</i> sp.			
320.	<i>Tanypodinae</i> sp.			
321.	<i>Tasmanicosa leuckartii</i>			
322.	<i>Telephlebiidae</i> sp.			
323.	<i>Temnocephalidea</i> sp.			
324.	<i>Tenebrionidae</i> sp.			
325.	<i>Tipulidae</i> sp.			
326.	<i>Urodacus novaehollandiae</i>			
327.	<i>Urodacus similis</i>			
328.	<i>Veliidae</i> sp.			
329.	<i>Venator immansueta</i>			
330.	<i>Venatrix pullastra</i>			
331.	34113 <i>Westralunio carteri</i> (Carter's Freshwater Mussel)		□	
Mammal				
332.	24088 <i>Antechinus flavipes</i> subsp. <i>leucogaster</i> (Yellow-footed Antechinus, Mardo)			
333.	24209 <i>Arctocephalus tropicalis</i> (Subantarctic fur-seal)		□	
334.	24086 <i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)			
335.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattled Bat)			
336.	24187 <i>Chalinolobus morio</i> (Chocolate Wattled Bat)			
337.	24092 <i>Dasyurus geoffroyi</i> (Chuditch, Western Quoll)		□	
338.	24043 <i>Eubalaena australis</i> (Southern Right Whale)		□	
339.	24189 <i>Falsistrellus mackenziei</i> (Western False Pipistrelle, Western Falsistrelle)		P4	
340.	24041 <i>Felis catus</i> (Cat)	Y		
341.	24215 <i>Hydromys chrysogaster</i> (Water-rat, Rakali)		P4	
342.	48588 <i>Isodon fusciventer</i> (Quenda, southwestern brown bandicoot)		P4	
343.	24071 <i>Kogia sima</i> (Dwarf Sperm Whale)			Y
344.	24132 <i>Macropus fuliginosus</i> (Western Grey Kangaroo)			
345.	24051 <i>Megaptera novaeangliae</i> (Humpback Whale)		S	
346.	24213 <i>Mirounga leonina</i> (Southern Elephant Seal)			
347.	24223 <i>Mus musculus</i> (House Mouse)	Y		
348.	24210 <i>Neophoca cinerea</i> (Australian Sea-lion)		□	
349.	48022 <i>Notamacropus irma</i> (Western Brush Wallaby)		P4	
350.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			
351.	24085 <i>Oryctolagus cuniculus</i> (Rabbit)	Y		
352.	48070 <i>Phascogale tapoatafa</i> subsp. <i>wambenger</i> (South-western Brush-tailed Phascogale, Wambenger)		S	
353.	24166 <i>Pseudocheirus occidentalis</i> (Western Ringtail Possum, ngwayir)		□	
354.	24230 <i>Pseudomys albocinereus</i> (Ash-grey Mouse)			
355.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
356.	24145 <i>Setonix brachyurus</i> (Quokka)		□	
357.	24111 <i>Sminthopsis gilberti</i> (Gilbert's Dunnart)			
358.	25515 <i>Sminthopsis griseoventer</i> (Grey-bellied Dunnart)			
359.	24259 <i>Sus scrofa</i> (Pig)	Y		
360.	24167 <i>Tarsipes rostratus</i> (Honey Possum, Noolbenger)			
361.	25521 <i>Trichosurus vulpecula</i> (Common Brushtail Possum)			
362.	24158 <i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum)			
363.	30954 <i>Tursiops aduncus</i> (Indo-Pacific Bottlenose Dolphin)			
364.	24206 <i>Vespadelus regulus</i> (Southern Forest Bat)			
365.	24040 <i>Vulpes vulpes</i> (Red Fox)	Y		
Reptile				
366.	42368 <i>Acritoscincus trilineatus</i> (Western Three-lined Skink)			
367.	24991 <i>Aprasia repens</i> (Sand-plain Worm-lizard)			
368.	25335 <i>Caretta caretta</i> (Loggerhead Turtle)		□	
369.	43380 <i>Chelodina colliei</i> (South-western Snake-necked Turtle)			
370.	24980 <i>Christinus marmoratus</i> (Marbled Gecko)			
371.	25456 <i>Crenadactylus ocellatus</i> (Clawless Gecko)			
372.	30893 <i>Cryptoblepharus buchananii</i>			
373.	25020 <i>Cryptoblepharus plagiocephalus</i>			
374.	30899 <i>Ctenophorus adelaidensis</i> (Southern Heath Dragon, Western Heath Dragon)			
375.	25027 <i>Ctenotus australis</i>			
376.	25039 <i>Ctenotus fallens</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
377.	25047 <i>Ctenotus impar</i>			
378.	25049 <i>Ctenotus labillardieri</i>			
379.	41641 <i>Ctenotus ora</i> (Coastal Plains Skink)		P3	
380.	25074 <i>Ctenotus schomburgkii</i>			
381.	25766 <i>Delma fraseri</i> (Fraser's Legless Lizard)			
382.	24999 <i>Delma grayii</i>			
383.	25296 <i>Demansia psammophis</i> subsp. <i>reticulata</i> (Yellow-faced Whipsnake)			
384.	24939 <i>Diplodactylus polyophthalmus</i>			
385.	25092 <i>Egernia depressa</i> (Southern Pygmy Spiny-tailed Skink)			
386.	25100 <i>Egernia napoleonis</i>			
387.	25250 <i>Elapognathus coronatus</i> (Crowned Snake)			
388.	25119 <i>Hemiergis quadrilineata</i>			
389.	43384 <i>Hydrophis platurus</i> (Yellow-bellied Seasnake)			
390.	25128 <i>Lerista christinae</i>			
391.	25131 <i>Lerista distinguenda</i>			
392.	25133 <i>Lerista elegans</i>			
393.	25147 <i>Lerista lineata</i> (Perth Slider, Lined Skink)		P3	
394.	25165 <i>Lerista praepedita</i>			
395.	25005 <i>Lialis burtonis</i>			
396.	25184 <i>Menetia greyii</i>			
397.	25190 <i>Morethia butleri</i>			
398.	25191 <i>Morethia lineocellata</i>			
399.	25192 <i>Morethia obscura</i>			
400.	25248 <i>Neelaps bimaculatus</i> (Black-naped Snake)			
401.	25252 <i>Notechis scutatus</i> (Tiger Snake)			
402.	25253 <i>Parasuta gouldii</i>			
403.	25255 <i>Parasuta nigriceps</i>			
404.	25510 <i>Pogona minor</i> (Dwarf Bearded Dragon)			
405.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
406.	25511 <i>Pseudonaja affinis</i> (Dugite)			
407.	25259 <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
408.	42416 <i>Pseudonaja mengdeni</i> (Western Brown Snake)			
409.	25008 <i>Pygopus lepidopodus</i> (Common Scaly Foot)			
410.	25266 <i>Simoselaps bertholdi</i> (Jan's Banded Snake)			
411.	25518 <i>Strophurus spinigerus</i>			
412.	25519 <i>Tiliqua rugosa</i>			
413.	25204 <i>Tiliqua rugosa</i> subsp. <i>aspera</i>			
414.	25207 <i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			
415.	25218 <i>Varanus gouldii</i> (Bungarra or Sand Monitor)			
416.	25225 <i>Varanus rosenbergi</i> (Heath Monitor)			
417.	25227 <i>Varanus tristis</i> subsp. <i>tristis</i> (Racehorse Monitor)			

Conservation Codes

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

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



EPBC Act Protected Matters Report

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

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

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

Report created 31/01/19 18:31:37

[Summary](#)

[Details](#)

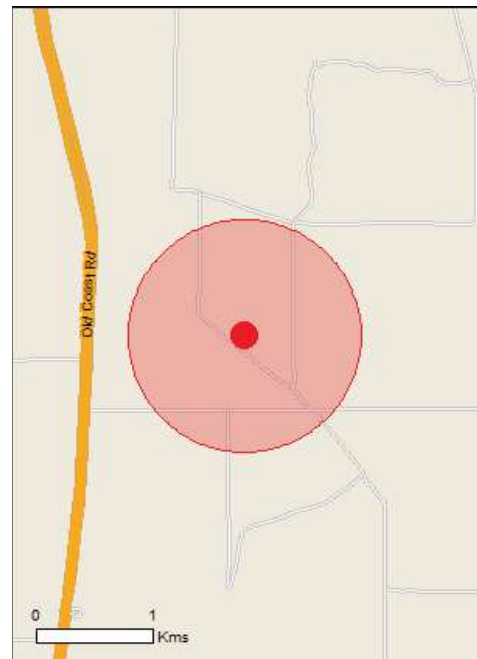
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



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

[Coordinates](#)

Buffer 1.0 km



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	1
Great Barrier Reef Marine Park	None
Commonwealth Marine Area	None
Listed Threatened Ecological Communities	1
Listed Threatened Species	18
Listed Migratory Species	10

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land	None
Commonwealth Heritage Places	None
Listed Marine Species	15
Whales and Other Cetaceans	None
Critical Habitats	None
Commonwealth Reserves (Terrestrial)	None
Australian Marine Parks	None

Extra Information

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

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

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	Resource Information
Name Peel/ylgorup system	Proximity Within 10km of Ramsar

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

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area

Listed Threatened Species	Resource Information
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Name	Status	Type of Presence
Birds		

Calidris canutus Red-trot, not 1855	Endangered	Species or species habitat may occur within area
--	------------	--

Calidris ferruginea Curlew Sandpiper 1856	Critically Endangered	Species or species habitat may occur within area
--	-----------------------	--

Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Arrak 167034	Vulnerable	Species or species habitat likely to occur within area
--	------------	--

Calyptorhynchus baudinii Baudin's Cockatoo, Long-billed Black-Cockatoo 1769	Endangered	Species or species habitat likely to occur within area
--	------------	--

Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo 159523	Endangered	Species or species habitat known to occur within area
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Pelecanus occidentalis Malleefowl 1934	Vulnerable	Species or species habitat likely to occur within area
---	------------	--

Numenius madagascariensis Eastern Curlew, Far Eastern Curlew 1847	Critically Endangered	Species or species habitat may occur within area
--	-----------------------	--

Rostratula australis Australian Painted-Snipe, Australian Painted Snipe 177037	Endangered	Species or species habitat may occur within area
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Mammals

Dasyurus geoffroii Chuditch, Western Quoll 1330	Vulnerable	Species or species habitat likely to occur within area
--	------------	--

Pseudocheirus occidentalis Western Ringtail Possum, Ngalyir, Womp, Woder, Ngoor, Ngoolangit 125911	Critically Endangered	Species or species habitat likely to occur
---	-----------------------	--

Name	Status	Type of Presence within area
Plants		
Andersonia gracilis Slender Andersonia 14470	Endangered	Species or species habitat may occur within area
Caladenia huegeli King Spiderorchid, Grand Spiderorchid, Rusty Spiderorchid 7309	Endangered	Species or species habitat may occur within area
Chamelaucium sp. Gingin (N.G. Marchant 6) Gingin Wattle 88881	Endangered	Species or species habitat may occur within area
Diuris micrantha Dwarf Beeorchid 55082	Vulnerable	Species or species habitat likely to occur within area
Diuris purdiei Purdie's Donkeyorchid 12950	Endangered	Species or species habitat likely to occur within area
Drakaea elastica Glossy-leaved Hammer orchid, Glossy-leaved Hammer orchid, Warty Hammer orchid 16753	Endangered	Species or species habitat may occur within area
Drakaea micrantha Dwarf Hammerorchid 56755	Vulnerable	Species or species habitat likely to occur within area
Synaphea sp. Serpentine (G.R. Brand 103) 86879	Critically Endangered	Species or species habitat may occur within area

Threatened Migratory Species	Resource Information
Species is listed under a different scientific name on the EPBC Act Threatened Species list.	
Name	Type of Presence

Name	Threatened	Type of Presence
Migratory Marine Birds		

Apus pacificus Fork-tailed Shearwater 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

	Species or species habitat may occur within area
--	---

Migratory Wetlands Species	
Actitis hypoleucos Common Sandpiper 59309	Species or species habitat may occur within area

	Species or species habitat may occur within area
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Calidris acuminata Sharp-tailed Sandpiper 874	Species or species habitat may occur within area
--	---

Calidris canutus Red Knot, Knot 855	Endangered	Species or species habitat may occur within area
--	------------	---

Calidris ferruginea Curlew Sandpiper 856	Critically Endangered	Species or species habitat may occur within area
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Calidris melanotos Pectoral Sandpiper 858		Species or species habitat may occur within area
--	--	---

Numenius madagascariensis Eastern Curlew, Far Eastern Curlew 847	Critically Endangered	Species or species habitat may occur within
---	-----------------------	--

Name	Threatened	Type of Presence area
Pandion haliaetus Spree 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	Threatened	Type of Presence area	Resource Information
Species is listed under a different scientific name on the EPBC Act Threatened Species list.			
Name	Threatened	Type of Presence	
Birds			
Actitis hypoleucos Common Sandpiper 59309			Species or species habitat may occur within area
Apus pacificus Fork-tailed Shearwater 678			Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret 59541			Species or species habitat likely to occur within area
Ardea ibis Cattle Egret 59542			Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper 874			Species or species habitat may occur within area
Calidris canutus Red Knot, Knot 855	Endangered		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper 856	Critically Endangered		Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper 858			Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea Eagle 943			Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater 670			Species or species habitat may occur within area

Name	Threatened	Type of Presence
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
Rostratula benghalensis sensu lato Painted Snipe 889	Endangered	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

State and Territory Reserves	Resource Information
Name	State
Crampton	WA

Invasive Species

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

Name	Status	Type of Presence
Birds		
<i>Anas platyrhynchos</i> Mallard 974		Species or species habitat likely to occur within area
<i>Columba livia</i> Rock Pigeon, Rock Dove, Domestic Pigeon 803		Species or species habitat likely to occur within area
<i>Passer domesticus</i> House Sparrow 405		Species or species habitat likely to occur within area
<i>Passer montanus</i> Eurasian Tree Sparrow 406		Species or species habitat likely to occur within area
<i>Streptopelia chinensis</i> Spotted Turtle Dove 780		Species or species habitat likely to occur within area
<i>Streptopelia senegalensis</i> Laughing Turtle Dove, Laughing Dove 781		Species or species habitat likely to occur within area

Mammals

Name	Status	Type of Presence
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
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
Lepus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax, Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffelgrass, Black Buffelgrass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Genista sp. Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Ulex europaea Ulex, Common Ulex [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.alba, S.reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		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 (MA/EN or BI/C/IM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time frame, maps are derived either from 0.04 or 0.02 decimal degree cells by an automated process using polygon capture techniques (static 100 kilometre grid cells, alpha hull and 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, 100 or 250 map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

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

- migratory and
- marine

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

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

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

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

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

Coordinates

33.01645 115.74702

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

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

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