

UPDATED FAUNA SURVEYS

LOT 660 LA PEROUSE COURT, GOODE BEACH, CITY OF ALBANY, WESTERN AUSTRALIA



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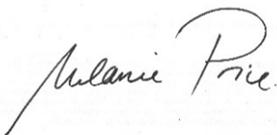


11 September
2023

Signature

Date

Reviewed by: Melanie Price
Principal Environmental
Scientist



11 September
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EXECUTIVE SUMMARY

Dr Cherry Martin is proposing to develop holiday accommodation at Lot 660 (No. 40) La Perouse Court, Goode Beach in the City of Albany, Western Australia. As part of the development process, the project requires referral under the federal *Environmental Protection and Biodiversity Conservation Act 1999* and the Western Australian *Environmental Protection Act 1986*. The proposal would involve the clearing of 2.23 ha of native vegetation for tourist accommodation and associated infrastructure with the remainder of the site being retained and protected under a conservation covenant or similar mechanism.

A targeted survey for Black Cockatoos (*Zanda latirostris*, *Zanda baudinii* and *Calyptorhynchus banksia*), Western Ringtail Possums (*Pseudocheirus occidentalis*) and Main's Assassin Spider (*Zephyrarchaea mainae*) was undertaken in 2016/2017. However, as part of the referral process in 2023, the Department of Climate Change, Energy, the Environment and Water have requested updated information to ensure that the environment has not changed significantly and that newly listed conservation significant fauna are either not present at the site or will not be significantly impacted.

The purpose of this project was to reassess the fauna values of the site and identify the potential for the site to support populations of conservation significant fauna including Black Cockatoos and Western Ringtail Possums.

The conclusions of the survey are:

- The habitat comprises *Agonis flexuosa/Adenanthos sericeus* Closed Scrub in excellent condition.
- Based on past records and habitat modelling the following five threatened species were considered as potentially occurring in the survey area:
 - *Falco peregrinus* (Peregrine Falcon) Other specially protected: Possibly occurs. May fly over but unlikely to rely on survey area.
 - *Pandion haliaetus* (Osprey) Migratory: Possibly occurs. May fly over but unlikely to rely on survey area.
 - *Isodon fusciventer* (Quenda) Priority 4: Possibly occurs. Suitable habitat present, however, is more likely to occur in the vegetation immediately surrounding Lake Vancouver which will not be impacted.
 - *Parantechinus apicalis* (Dibbler) Endangered: Possible – unlikely. Last recorded in 1988 in Torndirrup National Park (~3 km from Lake Vancouver). Torndirrup has experienced multiple bushfires since 1988. Due to the proximity of the urban portion of Goode Beach it is considered unlikely that that this species would occur on the subject land.
 - *Pseudocheirus occidentalis* (Western Ringtail Possum) Critically Endangered: Likely. Suitable habitat present in the proposed clearing area, and this species has been recorded in the western portion Lot 660.

- During the site assessment, nine vertebrate fauna species were observed including two bird species (Black Cockatoo and Osprey) that are conservation significant. Both birds were seen flying over but were not utilising the resources at the site.
- The vegetation contains dense thickets of *Agonis flexuosa* and is therefore likely to support Western Ringtail Possums. Western Ringtail Possums have previously been observed in adjacent vegetation types.
- It is considered that the removal of 2.23 ha of Western Ringtail Possum habitat can be adequately managed to retain habitat connectivity between Vancouver Peninsula and Torndirrup National Park with a focus on preserving the integrity of the remaining 5.48 ha of fauna habitat within Lot 660.
- With the retention of a continuous vegetation link and implementation of a conservation covenant (or similar) to the residual habitat of Lot 660, impacts to Western Ringtail Possum are considered minor.
- The habitat in the survey area is potentially suitable for Dibblers. However, the nearby residences and presence of foxes at the site greatly reduce the likelihood that Dibblers persist in the area.
- The survey area does not provide suitable nesting, roosting or significant foraging habitat for Black Cockatoos. Black Cockatoos may occasionally be present in the area due to the presence of nearby roosting sites, Lake Vancouver and other areas of suitable high-quality vegetation in the region. This project will not impact on significant habitat for Black Cockatoos and therefore does not require referral under current guidelines.
- Migratory water birds are unlikely to be impacted by the development from direct or indirect impacts.

1 INTRODUCTION

1.1 PROJECT BACKGROUND

Dr Cherry Martin (the Proponent) is proposing to develop holiday accommodation at Lot 660 (No. 40) La Perouse Court, Goode Beach in the City of Albany, Western Australia (WA) (Figures 1 and 2). As part of the development process, the project requires referral under the federal *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Western Australian *Environmental Protection Act 1986* (EP Act).

The property is 8 km southeast of the Albany central business district, on the southeastern side of Princess Royal Harbour and at the base of Vancouver Peninsula. The Lot has a 270 m frontage to Frenchman Bay and Goode Beach and is separated from the beach by Reserve No. 28111 which is approximately 30 m wide. Lot 660 wraps around Reserve 48916 which contains Lake Vancouver, a conservation category wetland.

Lot 660 comprises 7.7107 ha of native vegetation. The northeastern portion is zoned in the City of Albany Local Planning Scheme No. 1 as 'Special Use Zone 1' for Holiday Accommodation (Figure 3). The balance of the lot comprises a local scheme reserve 'Parks and Recreation'. The proposal would involve the clearing of 2.23 ha of native vegetation for tourist accommodation and associated infrastructure in the northeast portion of the site (Figure 2) with the remainder of the site being retained and protected under a conservation covenant or similar mechanism.

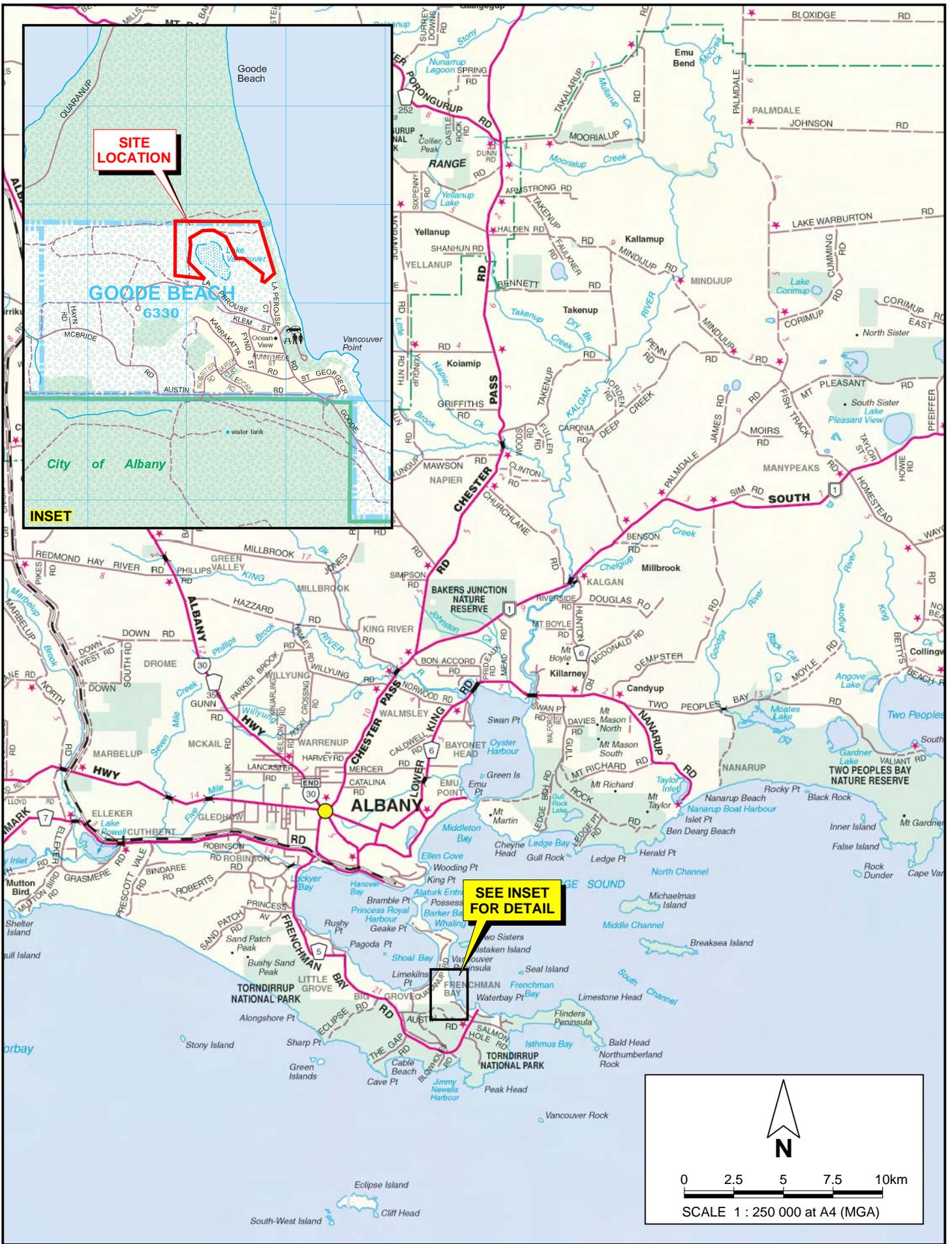
1.2 PURPOSE AND SCOPE

A targeted survey for Black Cockatoos (*Zanda latirostris*, *Zanda baudinii* and *Calyptorhynchus banksia*), Western Ringtail Possums (*Pseudocheirus occidentalis*) and Main's Assassin Spider (*Zephyrarchaea mainae*) was undertaken in 2016/2017 (Aurora Environmental, 2017; Appendix 1). However, as part of the referral process in 2023, the Department of Climate Change, Energy, the Environment and Water (DCCEEW) have requested updated information to ensure that the environment has not changed significantly and that newly listed conservation significant fauna are either not present at the site or will not be significantly impacted.

The purpose of this project was to reassess the fauna values of the site and identify the potential for the site to support populations of conservation significant fauna including Black Cockatoos and Western Ringtail Possums. The scope of work included an additional site visit to assess fauna habitat and especially the habitat suitability for Black Cockatoos and Western Ringtail Possums with reference to DCCEEW's *Referral Guidelines for 3 WA Threatened Black Cockatoo Species* and DCCEEW's *Significant impact guidelines for the vulnerable western ringtail possum (Pseudocheirus occidentalis) in the southern Swan Coastal Plain, WA*. The site visit was restricted to the 2.23 ha proposed development area (survey area), but the reporting accounts for potential impacts to fauna within adjacent habitat. Findings from the previous fauna survey (Appendix 1) are also referred to where appropriate.

This survey comprised the following:

- A desktop study to gather contextual information using the Department of Biodiversity, Conservation and Attractions' (DBCA's) threatened and priority fauna database, NatureMap, the Department of Climate Change, Energy, the Environment and Water's (DCCEEW) Protected Matters Search Tool (PMST), existing surveys and other publicly available literature and spatial data;
- A day-time basic fauna survey and habitat assessment to validate the findings from the desktop study, assess habitat types and condition and record opportunistic sightings of fauna species;
- An assessment of fauna with motion-detection cameras to document fauna present and potentially determine the presence of conservation significant fauna;
- A site assessment to investigate evidence of black cockatoo activity and assess the presence of breeding, foraging and roosting habitat within the survey area; and
- A site assessment to determine the habitat suitability for Western Ringtail Possums within the survey area.



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 PINPOINT CARTOGRAPHICS (08) 9562 7136


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 Drawn: M. Price Date: 26 May 2021

Flint Legal (on behalf of Dr Cherry Martin)
 HOLIDAY ACCOMMODATION
 LOT 660 LA PEROUSE COURT, GOODE BEACH
REGIONAL LOCATION

Figure 1
 Job: CHE2018-002



N

0 10 20 30 40 50m

SCALE 1 : 1 500 at A3 (MGA)

Legend

- - - Site Boundary
- Cadastral Boundary
- - - Easement Boundary
- Topographic Contour

CHE2018-002_EIA_001_mp-002.dgn
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CADASTRAL SOURCE: Landgate, November 2019.
 CONTOUR SOURCE: Alan Tingay & Associates, Figure 4.
 AERIAL PHOTOGRAPH SOURCE: NearMap, flown March 2020.

Aurora

environmental

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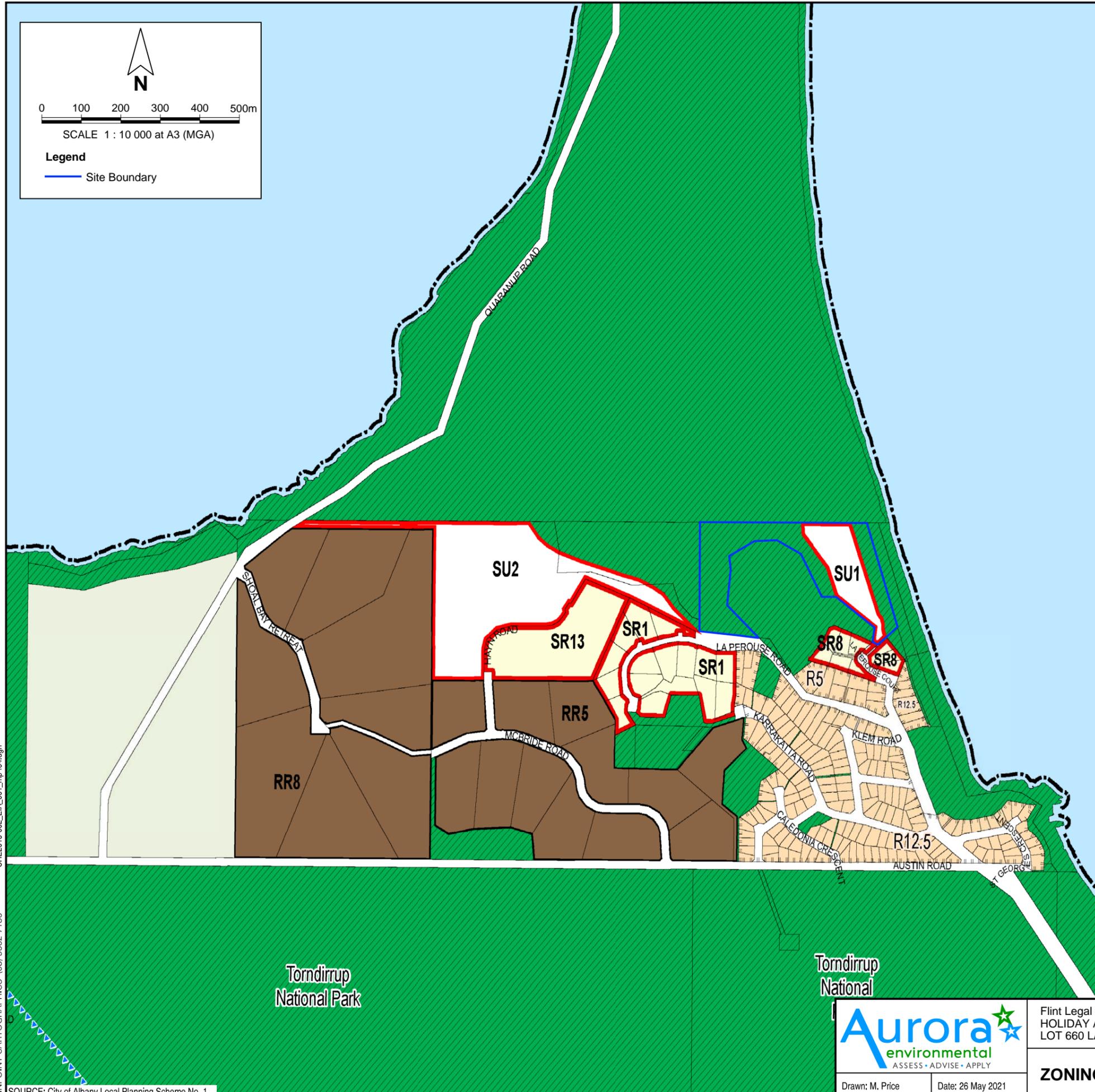
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 HOLIDAY ACCOMMODATION
 LOT 660 LA PEROUSE COURT, GOODE BEACH

SUBJECT LAND

Job: CHE2018-002

Figure 2



0 100 200 300 400 500m

 SCALE 1 : 10 000 at A3 (MGA)

Legend

 Site Boundary

LEGEND

LOCAL SCHEME RESERVES

(see scheme text for additional information)

	Local road		CFF Public use : Conservation of flora and fauna
	Major road		G Public use : Government
	Parks and recreation		H Public use : Hospital
	Priority road		M Public use : Museum
	Public use		PU Public use : Public utility
	A Public use :		R Public use : Refuse
	C Public use : Cemetery		S Public use : School
	CI Public use : Communication		T Public use : Technical college
	CP Public use : Community purpose		WC Public use : Water Corporation
			Rail

LOCAL SCHEME ZONES

(see scheme text for additional information)

	Caravan and camping		Port industry
	Clubs and institutions		Priority agriculture
	Conservation		Regional centre
	Future urban		Regional centre mixed business
	General agriculture		Regional centre mixed use
	General industry		Residential
	Highway commercial		Rural residential
	Hotel / motel		Rural small lot holdings
	Light industry		Rural village
	Local centre		Special residential
	Neighbourhood centre		Special use
			Tourist residential
			Yakamia Creek

OTHER CATEGORIES

(see scheme text for additional information)

	Scheme boundary		Albany port special control area (see c.6.4)
	Local Government boundary		Albany speedway noise special control area (see c.6.5)
	R20 R Codes		CZ1 Conservation zone area
	A1 Additional uses		DCA1 Development contribution area
	R1 Restricted uses		IA2 Industrial area
	RR1 Rural residential area		IA4BA Industrial buffer area
	RSH Rural small lot holdings		Public drinking water sources special control areas (see c.6.3)
	SR1 Special residential area		Spencer Park improvement special control area (see c.6.7)
	RV1 Rural village		Water corporation waste water treatment plant odour buffer special control area (see c.6.6)
	SU1 Special use area		Water corporation waste water treatment plant odour buffer special control area (see c.6.6)
	Albany airport special control area (see c.6.2)		Places of heritage value - buildings
			No zone
			Waterbodies

Torndirrup National Park

Torndirrup National

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 HOLIDAY ACCOMMODATION
 LOT 660 LA PEROUSE COURT, GOODE BEACH

ZONING

Figure 3

CHE2018-002_EIA_001_mp-004.dgn
 PINPOINT CARTOGRAPHICS (08) 9562 7136

SOURCE: City of Albany Local Planning Scheme No. 1.

Drawn: M. Price Date: 26 May 2021

Job: CHE2018-002

2 SITE CHARACTERISTICS

2.1 LAND USE

Lot 660 is located at Goode Beach, at the base of the Vancouver Peninsula. Vegetation on the site is continuous with the adjacent City of Albany Reserve 25295 which has a purpose of ‘Recreation’ and comprises 338.18 ha of native vegetation with strategic fire breaks and access to coastal areas.

Lot 660 wraps around Reserve 48916 which supports native vegetation and Lake Vancouver. Lake Vancouver comprises a lens of fresh groundwater which is expressed at ground surface. The lake receives drainage directly from the Goode Beach road network. The reserve is managed by the City of Albany for the purpose of ‘Public Recreation’.

To the south of Lot 660 is the residential area of Goode Beach. This settlement is not serviced with reticulated sewer, with most dwellings having primary (septic) treatment units. Surface and groundwater flow from the established residential area is towards Lake Vancouver and ultimately the ocean. The residential area extends south to the Torndirrup National Park which comprises 3,936 ha of coastal vegetation.

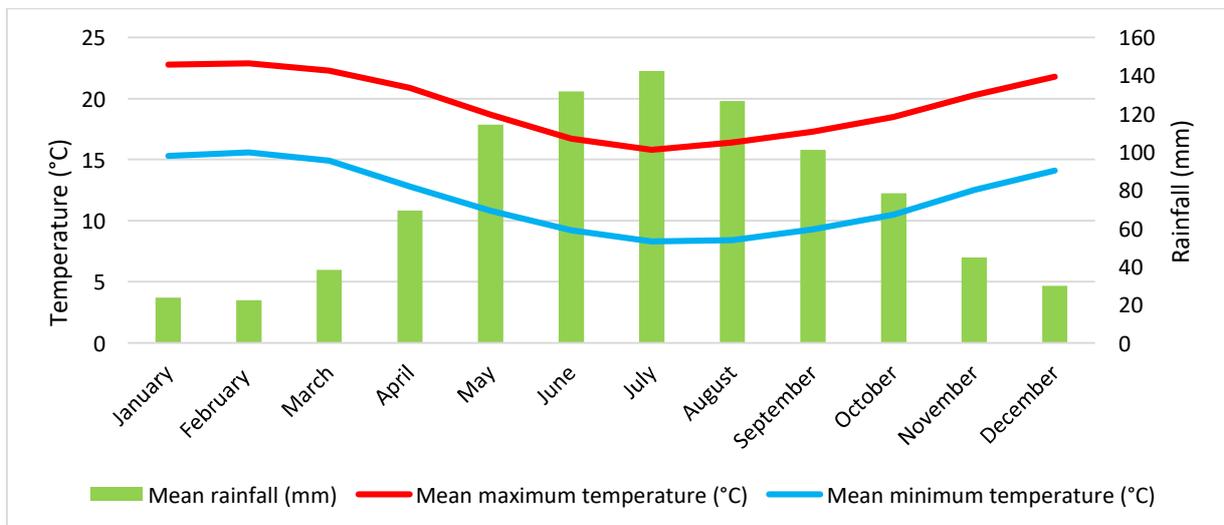
2.2 PHYSICAL ENVIRONMENT

2.2.1 Climate

Albany has a Mediterranean climate characterised by generally warm summers and cool, wet winters. Weather averages for the Albany airport (approximately 21 km north of the site) are presented in Plate 1. Areas closer to the coast, such as Goode Beach are likely to experience lower maximum and higher minimum temperatures due to proximity to the ocean and ocean breezes.

The mean annual rainfall for Albany is 923.3 mm (Bureau of Meteorology, 2023). Most rainfall falls between May and September with each of these months typically receiving over 100 mm (Plate 1).

PLATE 1: WEATHER STATISTICS ALBANY AIRPORT (STATION ID: 009500)



Source: Bureau of Meteorology, 2023

2.2.2 Topography and Geomorphology

Lot 660 is adjacent to Goode Beach which comprises a sandy coastline, backed by a low dune system (1 mAHD) and then a relatively steep second dune (4 – 6 mAHD). Between these dunes and Lake Vancouver is a series of parabolic dunes creating a landform of depressions bounded by east-west oriented sand ridges which range from 8 to 15 mAHD. Lake Vancouver itself is in a low depression between the primary and relict dune system. The survey area is undulating and varies from 2 to 8 mAHD.

2.2.3 Soils

The soils of Lot 660 comprise:

- Sp1: Peaty sand – dark grey and black, medium grained quartz, variable organic content. Unconsolidated material
- S2: Limesand – white, medium to coarse grained, moderately well sorted, quartz and shell debris. Unconsolidated material.
- S13: Limesand – white, medium to coarse grained, rounded quartz and shell debris. Unconsolidated material.

The primary dunes are made up of white beach and dune sands which are medium to fine grained and consist of moderately well sorted quartz and shell debris. The relict dunes comprise white sand with rounded quartz grains and shell debris which is medium grained. The lake bed and margins of Lake Vancouver comprise a dark grey to black peaty sand with medium grained quartz and variable organic content.

Soil profiles have been characterised on the site through excavation of test pits (Aurora Environmental, 2017b (see section 2.5 and Appendix 3)). The profile was characterised as follows:

- 0 – 10 cm BGL: dark grey fine sand with organic matter, roots;
- 10 – 100 cm BGL: grey sand, fine grained, grading to white, cream sand;
- 100 – 200 cm BGL: cream to light brown sand with shell in places.

2.2.4 Wetlands

Lake Vancouver is in a crown reserve which is surrounded by Lot 660. The lake is part of the Good Beach Suite and named 'Goode Beach Wetland' in the South Coast Significant Wetland dataset (Landgate, 2023). Lake Vancouver is categorised as a Conservation category wetland. It is an expression of the groundwater table, where changes in the level of the groundwater are reflected in the lake's water level. During winter, the water level of Lake Vancouver is ~1.0 m AHD and there is a groundwater flow gradient from west to east (Rockwater, 2019). The seasonal fall in the groundwater table during summer, coupled with relatively high evaporation from the lake may temporarily cause the localised flow of groundwater toward the lake. However, groundwater modelling (Rockwater, 2019) indicates that the net flow is always to the east (to the ocean).

2.3 BIOLOGICAL ENVIRONMENT

2.3.1 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation for Australia (IBRA version 7) divides the Australian continent into 89 bioregions and 419 subregions. IBRA regions represent a landscape-based approach to classifying the land surface, including attributes of climate, geomorphology, landform, lithology and characteristic flora and fauna.

Lot 660 occurs within the Warren bioregion which totals over one million hectares. The Warren bioregion is dissected undulating country of the Leeuwin Complex, Southern Perth Basin (Blackwood Plateau), South-West intrusions of the Yilgarn Craton and western parts of the Albany Orogen. It comprises Karri forest on loamy soils, Jarrah-Marri forest on laterites, low Jarrah woodlands and paperbark/sedge swamps in the depressions and plains and Peppermint (*Agonis flexuosa*) and Banksia woodlands and heaths on Holocene marine dunes (Hearn *et al.*, 2002).

2.3.2 Vegetation and Flora

Lot 660 intersects the Torndirrup_22 low woodland and the Torndirrup_423 scrub heath pre-European vegetation types (DPIRD, 2023). The survey area in particular intersects with the Vegetation Association Torndirrup_22 low woodland *Agonis flexuosa*.

Previous flora investigations (Alan Tingay and Associates, 1992) have described the vegetation in the survey area as *Agonis flexuosa*/*Adenanthos sericeus* Closed Scrub. This vegetation type is dense with the dominant shrubs 3-4 m tall and 80-90% foliage cover arising from many individual stems and multi-stemmed plants. There is very little sub stratum under the shrubs due to the lack of light penetrating the dense overstorey. However, the ground is covered densely by the sedge *Desmocladus flexuosus* and to a lesser extent *Lepidosperma gladiatum* and *Ficinia nodosa*. The vegetation is in Excellent condition with little to no evidence of weeds or other disturbance.

2.4 BLACK COCKATOOS

Black Cockatoos are protected under State and Commonwealth legislation and may occur in the survey area. Baudin's Black Cockatoo (*Zanda baudinii* (also known as *Calyptorhynchus baudinii*)) and Carnaby's Black Cockatoo (*Zanda latirostris* (also known as *Calyptorhynchus latirostris*)) are listed as Endangered under the EPBC Act and the Western Australian *Biodiversity Conservation Act 2016*. The Red-Tailed Black Cockatoo (*Calyptorhynchus banksii naso*) is listed as Vulnerable. The populations of all three species are declining and this is expected to continue (Department of Agriculture, Water and the Environment, 2022).

Black Cockatoos rely on suitable breeding, roosting and foraging habitats for survival. Black Cockatoos nest in tree hollows which can take over 200 years to develop (Department of Agriculture, Water and the Environment, 2022). Roosting trees provide suitable habitat in the non-breeding season close to food and water resources and a safe place to rest at night (Department of Agriculture, Water and the Environment, 2022). Black Cockatoos require foraging habitat within 12 km of their nest during the breeding season to successfully raise chicks (Department of Agriculture, Water and the Environment,

2022). During the non-breeding season, they prefer to forage within 20 km of their roosting site although this can be greater (Department of Agriculture, Water and the Environment, 2022).

The survey area is within the South Coast region for the purpose of the WA referral guidelines (Department of Agriculture, Water and the Environment, 2022). This region supports Jarrah-Marri forest, Karri forest, low heath and scrub and provides foraging resources for all three species of Black Cockatoo (Department of Agriculture, Water and the Environment, 2022). This region also provides critical breeding habitat for Baudin's and Carnaby's Cockatoo (Department of Agriculture, Water and the Environment, 2022).

Baudin's and Carnaby's Cockatoos nest in suitably sized hollows of live or dead trees (usually Eucalypts). Baudin's Cockatoos feed primarily on the seeds of Marri and proteaceous plants in woodlands or forest. During the breeding season, they feed primarily in native vegetation, particularly on Marri, including the seeds, flowers, nectar and grubs (Department of Agriculture, Water and the Environment, 2022). Carnaby's Cockatoos feed primarily in native woodland, shrubland and heathland on proteaceous species, *Callistemon* species and Marri (Department of Agriculture, Water and the Environment, 2022). Forest Red-tailed Black Cockatoos feed primarily on Jarrah and Marri seeds in woodlands and forest and at the edges of Karri forest (Department of Agriculture, Water and the Environment, 2022).

Habitat loss and fragmentation is the main cause of Black Cockatoo population decline, primarily from loss of suitable nesting trees, foraging habitat and fragmentation of vegetation patches (Department of Agriculture, Water and the Environment, 2022). Black Cockatoos are considered a slow-breeding species (1 to 2 chicks per year) which means it is difficult to recover from population decline (Department of Agriculture, Water and the Environment, 2022).

The survey area is within the buffered area of a Black Cockatoo roosting site (Plate 2; DBCA-064).

PLATE 2: BLACK COCKATOO ROOSTING SITES (BUFFERED). SURVEY AREA IS SHOWN IN RED



Source: Landgate, 2023

2.5 WESTERN RINGTAIL POSSUMS

Western Ringtail Possums (WRP) (*Pseudocheirus occidentalis*) are protected under State and Commonwealth legislation and may occur at the site. The WRP is listed as Critically Endangered under the *Environmental Protection and Biodiversity Conservation Act 1999* and the *Western Australian Biodiversity Conservation Act 2016*. The population trend for WRP is declining (Department of the Environment, Water, Heritage and the Arts, 2009a) and considered to be facing an extremely high risk of extinction in the wild. However, populations in the Albany area appear to have adapted and have a relatively resilient population (Van Helden *et al.*, 2020).

WRP are arboreal and spend most of their time in trees (Department of the Environment, Water, Heritage and the Arts, 2009b). Their habitat is usually located close to water courses, swamps, or on floodplains (Department of the Environment, Water, Heritage and the Arts, 2009b). Areas with high canopy continuity are also associated with higher WRP population densities (Department of the Environment, Water, Heritage and the Arts, 2009b). WRP primarily feed on upper and midstorey myrtaceous plants such as Peppermint, Marri and Jarrah (Department of Parks and Wildlife, 2017). Tree hollows are also very important for WRP, with hollow abundance positively correlated with possum abundance (Jones *et al.*, 1994; Jones and Hillcox, 1995). Other shelters for WRP include dreys, platforms, hollow logs, balga (*Xanthorrhoea* spp.) skirts, sedges, forest debris and empty rabbit warrens (Department of Parks and Wildlife, 2017).

WRP were once widely distributed across southern and south-western Western Australia but much of their habitat has been cleared or become degraded, restricting species range. WRP now only occur patchily in the south-west of Western Australia, often in coastal or near-coastal forest where Peppermint trees (*Agonis flexuosa*) occur as a major component (Jones *et al.*, 1994). There are three key management zones that are known to currently or have previously supported large populations of WRP including the Swan Coastal Plain zone (Peppermint woodlands and Peppermint/Tuart forests between Bunbury and Augusta), Southern Forest zone (Jarrah forests near Manjimup) and South Coast zone (diverse vegetation types from Walpole to Cheynes Beach, but predominantly in near-coastal limestone heath, Jarrah Marri thicket woodland and forest, riparian, Peppermint woodland and Karri forest) (Department of Parks and Wildlife, 2017).

Critical habitat for WRP is poorly known and varies between different management zones. However, common attributes include availability of high nutrient foliage for food, suitable structures for protection/nesting, and canopy continuity to avoid/escape predation and other threats (Jones *et al.*, 1994). Suitable vegetation communities for WRP include long unburnt mature remnants of Peppermint woodlands with high canopy continuity and high foliage nutrients and Jarrah-Marri forests and woodlands with low levels of disturbance (e.g. logging or fire), low numbers of invasive predators (especially foxes) and high habitat connectivity. Other suitable vegetation communities include coastal heath, myrtaceous heaths and shrublands, Bullich dominated riparian zones and Karri forest (Department of Parks and Wildlife, 2017). Linkages between suitable habitats are also critical for the long-term survival of WRP but can comprise alternative vegetation types (Department of Parks and Wildlife, 2017).

Urban areas can also support populations of WRP, especially in areas containing mature Peppermint trees with large, dense canopies (Department of Parks and Wildlife, 2017). Urban gardens can provide

alternative food sources that are regularly watered and maintained as well as alternative shelters in buildings and artificial connections (fences and powerlines) between habitats (Department of Parks and Wildlife, 2017). However, there are additional risks potentially associated with urban environments including vehicle strike and death from pet dogs and cats.

The abundance of WRP within and between different vegetation types is poorly understood in the South Coast Zone, in which Albany and hence the site is situated (Department of Parks and Wildlife, 2017). Around the Albany urban area, most WRP records are from within coastal limestone heath vegetation (Department of Parks and Wildlife, 2017). However, in general the critical habitat for WRP in the South Coast Zone cannot be clearly defined and therefore all suitable remnant habitat is considered important (Department of Parks and Wildlife, 2017). Due to the milder climate, the South Coast zone is likely to become increasingly important to the survival of WRP as the anticipated warming and drying climate trends affect the foraging and shelter quality of vegetation (Molloy *et al.* 2014; Department of Parks and Wildlife, 2017).

2.6 PREVIOUS FAUNA SURVEYS

A targeted Survey for Western Ringtail Possum (WRP), Main's Assassin Spider and Black Cockatoos (Aurora Environmental, 2017a; Appendix 1) was undertaken for the purpose of assessing the fauna values at the site. The following conclusions were made:

Fauna Habitat

The subject land comprises 7.701 ha, 2.1¹ ha of which is proposed to be cleared for development. The area proposed to be cleared comprises Peppermint (*Agonis flexuosa*) *Adenanthos sericeus* closed scrub in Excellent or Type 1 Residual condition with little to no evidence of weeds or other disturbance.

Western Ringtail Possums

No dreys or other signs of WRP were noted in the day time survey. The nocturnal survey identified a single WRP to the west of Lake Vancouver. The habitat in the development footprint is considered to be suitable for WRP as it contains Peppermint (*Agonis flexuosa*) and is dense and relatively undisturbed.

Clearing of more than 0.5 ha of suitable WRP habitat is a trigger for referral to the Department of Environment and Energy under the *Environment Protection and Biodiversity Conservation Act 1999*.

Black Cockatoos

Black Cockatoos are known to be present in the Goode Beach area. Assessment of the area proposed to be cleared indicates that the vegetation is not likely to provide roosting, breeding or foraging habitat due to the absence of suitable species and structure.

¹ Now 2.32 ha proposed to be cleared.

Main's Assassin Spider

Sampling of 26 locations within the development footprint failed to locate Main's Assassin Spider. The presence of suspended leaf litter, the spider's favoured habitat was relatively sparse compared to the Sandpatch Windfarm area where the species is commonly found. It is unlikely that the spider is present within the area proposed to be cleared (Aurora Environmental, 2017a, page 8 (see Appendix 1)).

3 METHODOLOGY

3.1 DESKTOP REVIEW

Updated state and Commonwealth database searches were conducted to identify fauna species that have been recorded within or in close proximity to the survey area and identify any conservation significant species that have been recorded or may have suitable habitat within the survey area (Table A). Results were interpreted to provide context to the potential values and threats associated with the survey area. Consideration was given to the likelihood of the species being present based on mapped distribution, specimens formerly identified or presence of suitable habitat present. Animals that are exclusively marine were excluded.

TABLE A: FAUNA DATABASE SEARCHES

DATABASE	DATE SEARCH RESULTS RECEIVED	SEARCH FOCUS	SEARCH RESULT
Australian Government Protected Matters Search Tool (PMST) (DCCEEW, 2023)	24/03/2023	Matters of National Environmental Significance (MNES)	Survey area + 10 km buffer
DBCA NatureMap (DBCA, 2023)	17/03/2023	<ul style="list-style-type: none"> • Conservation Significant fauna • Fauna species list 	Survey area + 10 km buffer
DBCA Threatened and Priority Fauna Database	8/03/2022	<ul style="list-style-type: none"> • Protected Fauna 	Survey area + 10 km buffer

3.2 FIELD SURVEY

A field survey was undertaken on 21 August 2023 by Melanie Price of Aurora Environmental, an experienced environmental scientist, qualified zoologist and a Black Cockatoo and Western Ringtail Possum specialist and Dr Catherine Hall of Aurora Environmental, an experienced environmental scientist. All animals observed during the survey were recorded.

Motion detection cameras (Pet & Livestock HQ, Solar Powered Trail Camera for Wildlife Watching with Solar Panel, HH-632) were placed at five locations (Appendix 2) to observe fauna within the survey area and to aid in determining the presence of conservation significant fauna. Three cameras (locations 1, 2 and 4) were mounted in Peppermint trees (*Agonis flexuosa*) ~1.5 m above the ground specifically to observe Western Ringtail Possums and other arboreal fauna. Two cameras (locations 3 and 5) were located on the ground to observe ground-dwelling fauna.

The cameras were left for 8 days from 21 August – 30 August 2023 and were set to take pictures during the day and night. Cameras were mounted on a platform (Figure 4) with a lure to attract fauna to the location in accordance with methodology developed by Mark Cowan at the Department of Biodiversity, Conservation and Attractions (DBCA). Universal bait (mixture of peanut butter, oats, honey and fish sauce) was used as the lure and capped with insect mesh. The mesh ensured fauna (including invertebrates) could not access the bait and therefore did not need to be reset daily.

The cameras were removed on 30 August 2023 and the pictures analysed for fauna occurrences. All fauna observed were recorded.



FIGURE 4: CAMERA MOUNTINGS A) TREE-MOUNTED CAMERA B) GROUND CAMERA

3.3 BLACK COCKATOO HABITAT ASSESSMENT

A Black Cockatoo habitat assessment was undertaken on 21 August 2023 to determine the likelihood that Black Cockatoos utilise the survey area for breeding, roosting or foraging in accordance with the referral guidelines (Department of Agriculture, Water and the Environment, 2022).

Breeding Habitat

Assessment of black cockatoo breeding habitat involves the identification of all hollow forming trees species within the survey area that have a diameter at breast height (DBH) of over 50 cm. Species such as Wandoo and Salmon Gums are considered potential habitat trees if the DBH is greater than 30 cm. If potential breeding trees were present, the DBH of each tree was measured using a tape measure. The location of each potential breeding tree identified was recorded with a GPS and details of the tree species and the number and size of hollows (if any) were recorded. Target tree species include Marri, Jarrah and Karri or any other hollow forming species (e.g. *Corymbia/Eucalyptus*) of a suitable size that were present. Peppermint, *Banksia*, Sheoak and *Melaleuca* tree species (for example) were not assessed as they do not develop hollows that are used by black cockatoos.

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

Any tree which is alive or dead that contains one or more visible hollows (cavities within the trunk or branches) suitable for occupation by black cockatoo for the purpose of nesting/breeding. Hollows with an entrance greater than 12 cm in diameter and would

allow the entry of a black cockatoo into a suitably orientated and sized branch/trunk, will be recorded as a 'potential nest hollow'.

Identified hollows were examined using binoculars for evidence of actual use by black cockatoos (e.g. chewing around hollow entrance, scarring and scratch marks on trunks and branches). The calls of chicks were also listened for if a suitable hollow was present.

Night Roosting Habitat

Direct and indirect evidence of black cockatoos roosting within trees in the survey area was noted if observed. This included searching for branch clippings, droppings and moulted feathers.

Foraging Habitat

The location and nature of black cockatoo foraging evidence (e.g. chewed fruits around base of trees) observed during the field survey was recorded, if present. The nature and extent of potential foraging habitat present was also documented irrespective of the presence of any actual foraging evidence based on the foraging habitat descriptions provided in the *Referral Guidelines for 3 WA Threatened Black Cockatoo Species* (Department of Agriculture, Water and the Environment, 2022).

4 RESULTS AND DISCUSSION

4.1 DESKTOP ASSESSMENT

The NatureMap database search identified 419 species recorded within the search area comprising 15 amphibians, 223 birds, 84 invertebrates, 58 mammals and 39 reptiles (Appendix 3).

4.1.1 Conservation Significant Fauna

The PMST Database (Appendix 4) and DBCA Threatened and Priority Fauna Database (Appendix 5) identified 65 conservation significant fauna species comprising 50 birds, 10 mammals, one reptile and four invertebrates. The likelihood of occurrence of these species in the survey area was assessed (Appendix 6) and the following five species were considered as potentially occurring in the survey area:

- *Falco peregrinus* (Peregrine Falcon) Other specially protected: Possibly occurs. May fly over but unlikely to rely on survey area.
- *Pandion haliaetus* (Osprey) Migratory: Possibly occurs. May fly over but unlikely to rely on survey area.
- *Isoodon fusciventer* (Quenda) Priority 4: Possibly occurs. Suitable habitat present however, more likely to occur in the vegetation immediately surrounding Lake Vancouver which will not be impacted.
- *Parantechinus apicalis* (Dibbler) Endangered: Possible – unlikely. Last recorded in 1988 in Torndirrup National Park (~3 km from Lake Vancouver). Torndirrup has experienced multiple bushfires since 1988. Due to the proximity of the urban portion of Goode Beach it is considered unlikely that this species would occur on the subject land.
- *Pseudocheirus occidentalis* (Western Ringtail Possum) Critically Endangered. Likely. Suitable habitat present in the proposed clearing area, and this species has been recorded in the western portion Lot 660.

Migratory and aquatic birds were not considered likely to occur within the project footprint as the habitat is unsuitable. The proposal is not likely to impact Lake Vancouver, the surrounding wetland vegetation, or the coastal dunes. See section 4.4 for discussion of potential indirect impacts to conservation significant fauna.

Baudin's Black Cockatoo, Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo are unlikely to rely on the survey area based on the desktop assessment. The *Agonis flexuosa/Adenanthos sericeus* Closed Scrub vegetation does not provide suitable roosting or nesting habitat trees and the vegetation is not considered a significant resource when compared to the Black Cockatoo referral guidelines (Department of Agriculture, Water and the Environment, 2022). However, these species have been specifically addressed due to public concern that they may be present in the area. See section 4.3 for further discussion on the habitat suitability of the survey area for these species.

- *Calyptorhynchus banksii naso* (Forest Red-tailed Black Cockatoo) Vulnerable: Unlikely. Minor foraging habitat resources may be available. Unlikely to rely on survey area.

- *Zanda baudinii* (Baudin's Black Cockatoo) Endangered: Unlikely. Minor foraging habitat resources may be available. Unlikely to rely on survey area.
- *Zanda latirostris* (Carnaby's Black Cockatoo) Endangered: Unlikely. Minor foraging habitat resources may be available. Unlikely to rely on survey area.

4.1.2 Limitations

The EPBC Act PMST is based on bioclimatic modelling for the potential presence of species. As such, the mapping does not represent actual records of the species in the area.

The records from the DBCA searches of threatened and priority fauna provide more accurate information for the area as these are generally based upon historic records. However, some records of collections, sightings or trappings cannot be dated or verified due to inadequate information accompanying the records and may therefore misrepresent the current range of some conservation significant species.

4.2 FIELD SURVEY

4.2.1 Fauna Observations

Nine vertebrate fauna species were observed at Lot 660 by sight or call comprising six birds and two amphibians. Two bird species (Black Cockatoo and Osprey) are conservation significant. Both birds were seen flying over but were not utilising the resources at the site.

TABLE B: FAUNA SPECIES OBSERVATIONS

COMMON NAME	SPECIES NAME
AMPHIBIANS	
Motorbike Frog (dead)	<i>Litoria moorei</i>
Quacking Frog (calls)	<i>Crinia georgiana</i>
BIRDS	
Black Cockatoo	<i>Zanda sp.</i>
Kookaburra (call)	<i>Dacelo novaeguineae</i>
Laughing Dove	<i>Spilopelia senegalensis</i>
Osprey	<i>Pandion haliaetus</i>
Pacific Black Duck	<i>Anas superciliosa</i>
Raven	<i>Corvus coronoides</i>
Willy Wagtail	<i>Rhipidura leucophrys</i>

4.2.2 Fauna Records - Cameras

No fauna were recorded from tree-mounted cameras 1 and 2. Camera 4 (tree-mounted) recorded one small brown bird. The species could not be determined as the picture was recorded in the evening and

the low-light levels prevented a high-quality photo record. Ground cameras 4 and 5 recorded rats, foxes and a king skink (Table C). Fauna photos are provided in Appendix 7.

TABLE C: FAUNA RECORDS - CAMERAS

COMMON NAME	SPECIES NAME	OCCURENCES
Camera 1 (tree-mounted)		
No records		
Camera 2 (tree-mounted)		
No records		
Camera 3 (ground)		
Black Rat	<i>Rattus rattus</i>	13
European Fox	<i>Vulpes vulpes</i>	3
Camera 4 (tree-mounted)		
Small brown bird (Thornbill? Silvereve?)		1
Camera 5 (ground)		
Black Rat	<i>Rattus rattus</i>	6
King Skink	<i>Egernia kingii</i>	1

4.2.3 Fauna Habitat

The vegetation at the site has remained undisturbed except for firebreak maintenance along existing tracks since the flora survey in 1992. There have been no fires or other major disturbance.

The vegetation description from the flora survey (*Agonis flexuosa/Adenanthos sericeus* Closed Scrub in excellent condition) accurately describes the current state of the vegetation in the survey area. A fauna habitat summary is provided in Table D.

TABLE D: FAUNA HABITAT SUMMARY

AGONIS FLEXUOSA/ADENANTHOS SERICEUS CLOSED SCRUB	
Habitat Structure	<i>Agonis flexuosa/Adenanthos sericeus</i> Closed Scrub. Dense vegetation with the dominant shrubs 3-4 m tall and 80-90% foliage cover arising from many individual stems and multi-stemmed plants. There is very little sub stratum under the shrubs due to the lack of light penetrating the dense overstorey. However, the ground is densely covered by the sedge <i>Desmocladius flexuosus</i> and to a lesser extent <i>Lepidosperma gladiatum</i> and <i>Ficinia nodosa</i> . The vegetation is in Excellent condition with little to no evidence of weeds or other disturbance. Moderate-steep undulating landscape.
Presence or absence of refugia	Moderate to high presence of refugia (understorey, leaf litter, small fallen branches, fallen branches, crooks in trees).
Presence of absence of wetlands/ waterways	No wetlands or waterways within the survey area.
Location of habitat within survey area compared to surrounding landscape	Extends beyond the boundaries of the survey area.
Habitat connectivity	High habitat connectivity to surrounding areas.
Current land use and disturbance	Vegetated. Few weeds. No recent fires.
Evaluation of likelihood of occurrence of conservation significant fauna	Likely habitat for Western Ringtail Possums.
Vegetation/ habitat condition	Vegetation is in Excellent condition.
Representative Photo	

4.3 TARGETED BLACK COCKATOO SURVEY

4.3.1 Black Cockatoo Spatial Data

The DBCA Black Cockatoo spatial data showed a confirmed Black Cockatoo roost at the margins of Lake Vancouver. The site inspection indicated that the potential tree is a *Melaleuca cuticularis* which would not normally be considered suitable for roosting and may actually be a tree used to perch and access the lake for drinking (Plate 3). An additional roosting site is located 570 m to the southwest of the survey area in remnant bushland adjacent to the Goode Beach residential area.

PLATE 3: LOCATION INDICATED BY THE TREE ROOSTING RECORD BY DBCA



4.3.2 Black Cockatoo Habitat Trees

The trees in the survey area comprise Peppermint (*Agonis flexuosa*). These trees do not provide suitable roosting or breeding habitat for Black Cockatoos.

4.3.3 Black Cockatoo Foraging Habitat Scoring

No evidence of Black Cockatoo foraging was observed at the site. A single white-tailed Black Cockatoo (*Zanda* sp.) was observed flying overhead during the survey.

The vegetation at the site is *Agonis flexuosa/Adenanthos sericeus* Closed Scrub. This does not constitute high quality foraging habitat for any of the three species of Black Cockatoo in accordance with the Referral Guidelines. An analysis of habitat suitability is provided in Table E.

TABLE E: FORAGING HABITAT SUITABILITY FOR BLACK COCKATOOS

SPECIES	DESCRIPTION OF SUITABLE FORAGING HABITAT ²	SUITABLE FORAGING HABITAT PRESENT (Y/N)
Baudin’s Cockatoo (<i>Zanda baudinii</i>)	Native eucalypt woodlands and forest, and proteaceous woodland and heath, particularly Marri, within the range of the species, including along roadsides and parkland cleared areas. Can include planted vegetation.	No
Carnaby’s Cockatoo (<i>Zanda latirostris</i>)	Native shrubland, kwongan heathland or woodland, dominated by proteaceous plant species such as <i>Banksia</i> spp. (including <i>Dryandra</i> spp.), <i>Hakea</i> spp. and <i>Grevillea</i> spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation.	No
Forest Red-tailed Black Cockatoo (<i>Calyptorhynchus banksii naso</i>)	Jarrah or Marri woodland and/or forest, or if it is on the edge of Karri forest, or if Wandoo and Blackbutt occur on the site, within the range of the subspecies, including along roadsides and parkland cleared areas.	No

4.4 CONSERVATION SIGNIFICANT FAUNA

Western Ringtail Possum

The site visit confirmed that the vegetation contains dense thickets of *Agonis flexuosa* and is therefore likely to support Western Ringtail Possums. The previous fauna survey (Aurora Environmental, 2017a) observed a single Western Ringtail Possum on the western side of Lake Vancouver outside the survey area (see Plate C, page 16 of Appendix 1). This habitat comprised a different vegetation type (*Agonis flexuosa/Eucalyptus* spp. Woodland over *Melaleuca thymoides* Low Heath; see Appendix 8). However, due to the presence of *Agonis flexuosa* and the continuation of this species throughout the vegetation in the area (Appendix 8) including the project footprint, it is reasonable to expect Western Ringtail Possums to be present within the survey area.

It is considered that the removal of 2.23 ha of Western Ringtail Possum habitat can be adequately managed to retain habitat connectivity between Vancouver Peninsula and Torndirrup National Park with a focus on preserving the integrity of the remaining 5.48 ha of fauna habitat within Lot 660.

Recent studies in Albany indicate that the WRP is persisting in urban environments, showing the species ability to survive in developed areas (Van Helden et al., 2020). With the retention of a

² Foraging habitat descriptions taken directly from Appendix A ‘Foraging quality scoring tool template’ of the *Referral Guidelines for 3 WA Threatened Black Cockatoo Species* (Department of Agriculture, Water and the Environment, 2022; page 26).

continuous vegetation link and implementation of a conservation covenant (or similar) to the residual habitat of Lot 660, impacts to Western Ringtail Possum are considered minor.

For projects on the Swan Coastal Plain, a referral under the EPBC Act is triggered for projects that will impact more than 0.5 ha of suitable Western Ringtail Possum habitat (Department of the Environment, Water, Heritage and the Arts, 2009). Although this project is not located on the Swan Coastal Plain, as more than 0.5 ha of suitable Western Ringtail Possum habitat would be cleared for the project, a referral should be made under the EPBC Act for this species.

Dibbler

The habitat in the survey area is potentially suitable for Dibblers. Dibblers can occupy a wide range of habitats and have been recorded in dunal scrubland on islands, although mainland records are usually in heathland (Friend, 2003). Critical habitat for Dibblers is typically long unburnt (>10 years) and usually has a dense canopy >1 m high (Department of the Environment, 2023). At some locations, the presence of Proteaceous and Myrtaceous flowering shrubs may also be important (Department of Environment, 2023).

Fire and foxes are significant threats to Dibbler populations (Friend, 2003). Dibblers were recorded within Torndirrup National Park in 1987 and 1988 ~3 km from the survey area. However, despite the continuation of fauna surveys in the region, they have not been recorded since and the area where they were recorded has since been extensively burnt (Friend, 2003). Although the vegetation of the survey area is long unburnt, the nearby residences and presence of foxes at the site greatly reduce the likelihood that Dibblers persist in the area.

Black Cockatoo

The survey area does not provide suitable nesting, roosting or significant foraging habitat for Black Cockatoos. Black Cockatoos may occasionally be present in the area due to the presence of nearby roosting sites, Lake Vancouver and other areas of suitable high-quality vegetation in the region. This project will not impact on significant habitat for Black Cockatoos and therefore does not require referral under current guidelines.

Migratory Water Birds

Migratory water birds have been recorded from Lake Vancouver and along the coastline of the Vancouver Peninsula. However, no suitable habitat for these species is present and therefore they are unlikely to occur within the survey area (Appendix 6). However, public concern has been raised over the proximity of the project to these areas and the potential for indirect impacts to these species. Potential indirect impacts include damage to Lake Vancouver or Goode Beach as a result of pedestrians and/or vehicles and noise from construction or resort activities that may disturb the fauna and disrupt their life cycle (e.g. abandoning eggs or chicks).

The development is set back from Goode Beach and will not impact the primary dunes closest to the beach (Aurora Environmental, 2017b and MP Rogers and Associates, 2017). Vehicle access to Goode Beach is currently prohibited and this will continue to be the case during and post-development. Beach access will be restricted to footpaths and low key infrastructure (e.g. fencing and steps) as shown in Aurora Environmental (2017b).

The project has been developed to ensure that there will be no impact to Lake Vancouver or the surrounding vegetation via a wetland buffer assessment (Aurora Environmental, 2020). The water quality of the lake will not be altered by the project from groundwater or surface water (Rockwater, 2019). The wetland vegetation will be fenced, and pedestrian access will be restricted to the footpaths currently managed by the City of Albany at Lake Vancouver (Reserve 48916). No vehicle access will be permitted at the Lake or surrounding wetland vegetation.

The wetland vegetation is very dense (Aurora Environmental, 2020) which will reduce any noise pollution from the construction and holiday accommodation operations. In addition, noise from the construction or holiday accommodation would not exceed the noise already caused by the residential area of Goode Beach immediately to the south of the Lake (including houses currently under construction). The dune system closest to Goode Beach will not be impacted by the project and therefore protect the beach environment from potential noise pollution.

The development will not be seen from either Lake Vancouver or Goode Beach.

It is considered that the proposed development will not impact on the migratory water birds present at Lake Vancouver or Goode Beach.

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APPENDIX 1

Previous Fauna Survey Report

**TARGETED SURVEY FOR WESTERN RINGTAIL POSSUM,
MAIN'S ASSASSIN SPIDER AND BLACK COCKATOO –
LOT 660 LA PEROUSE COURT, GOODE BEACH
CITY OF ALBANY, WESTERN AUSTRALIA**



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Report Number: AA2016/19

Report Version: V1

Report Date: 25 May 2017

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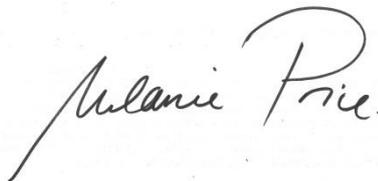
Aurora Environmental has implemented a comprehensive range of quality control measures on all aspects of the company's operation.

An internal quality review process has been applied to each project task undertaken by us. Each document is carefully reviewed and signed off by senior members of the consultancy team prior to issue to the client.

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Report No: AA2016/19

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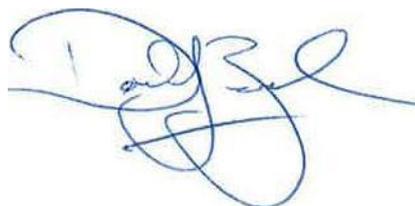


25 May 2017

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Date

Reviewed by: Paul Zuvela
Manager -
Environmental Impact
Assessment



25 May 2017

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LIST OF ABBREVIATIONS

AHD	Australian Height Datum
ARVS	Albany Regional Vegetation Survey
DBH	Diameter at Breast Height
DEE	Department of Environment and Energy (Commonwealth)
DPAW	Department of Parks and Wildlife (WA)
EPBC Act	Environment and Biodiversity Conservation Act 1999
GPS	Global Positioning System
ha	Hectare
km	Kilometre
m	Metre
mm	millimetre
MNES	Matters of National Environmental Significance
WRP	Western Ringtail Possum

SUMMARY

A targeted fauna survey was undertaken at Lot 660, La Perouse Court, Goode Beach to determine the status of habitat and presence of:

- *Pseudocheirus occidentalis* (Western Ringtail Possum, WRP);
- *Calyptorhynchus banksii naso* - Forest Red-tailed Black-Cockatoo;
- *Calyptorhynchus baudinii* - Baudin's Black-Cockatoo;
- *Calyptorhynchus latirostris* - Carnaby's Black-Cockatoo; and
- *Zephyrarchaea mainae* - Main's Assassin Spider.

The results of the assessment are:

Fauna Habitat

The subject land comprises 7.701 ha, 2.1 ha of which is proposed to be cleared for development. The area proposed to be cleared comprises Peppermint (*Agonis flexuosa*) *Adenanthos sericeus* closed scrub in Excellent (Keighery, 1994) or Type 1 Residual (Thackway and Lesslie, 2006) condition with little to no evidence of weeds or other disturbance.

Western Ringtail Possums

No dreys or other signs of WRP were noted in the day time survey. The nocturnal survey identified a single WRP to the west of Lake Vancouver. The habitat in the development footprint is considered to be suitable for WRP as it contains Peppermint (*Agonis flexuosa*) and is dense and relatively undisturbed.

Clearing of more than 0.5ha of suitable WRP habitat is a trigger for referral to the Department of Environment and Energy (DEE) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Black Cockatoos

Black Cockatoos are known to be present in the Goode Beach area. Assessment of the area proposed to be cleared indicates that the vegetation is not likely to provide roosting, breeding or foraging habitat due to the absence of suitable species and structure.

Main's Assassin Spider

Sampling of 26 locations within the development footprint failed to locate Main's Assassin Spider. The presence of suspended leaf litter, the spider's favoured habitat was relatively sparse compared to the Sandpatch Windfarm area where the species is commonly found. It is unlikely that the spider is present within the area proposed to be cleared.

1 INTRODUCTION

Aurora Environmental has been commissioned by Cherry Lee (the landowner) to undertake a targeted fauna assessment on Lot 660 La Perouse Court, Goode Beach (the subject land). The assessment specifically focussed upon Western Ringtail Possum (WRP), Main's Assassin Spider and the three species of Black Cockatoo.

The subject land located in the City of Albany and comprises 7.7107 ha, approximately 8km southeast (20km by road) of the central business district of Albany, on the south eastern side of Princess Royal Harbour and at the base of Vancouver Peninsula (Figures 1 and 2). It is immediately adjacent to the Goode Beach residential area.

The landowner is proposing to establish a low key tourist resort with a footprint of approximately 2.1 ha. Road and service access will be established on existing cleared alignments.

No previous fauna surveys have been undertaken at the site but Department of Parks and Wildlife (DPAW; Appendix 1) and Commonwealth Department of Environment and Energy (DEE; Appendix 2) databases¹ indicate that the area may contain habitat suitable for threatened species outlined in Table A. Discussions with officers of Albany DPAW indicated that as the vegetation in the development footprint is 'long unburnt', it may contain suitable habitat for Main's Assassin Spider (*Zephyrarchaea mainae*).

TABLE A: SPECIES STATUS

SPECIES NAME	WILDLIFE CONSERVATION ACT 1950 SCHEDULE 1	ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999
<i>Pseudocheirus occidentalis</i> - Western Ringtail Possum	Critically endangered mammals	Vulnerable
<i>Calyptorhynchus banksii naso</i> - Forest Red-tailed Black-Cockatoo	Vulnerable birds	Vulnerable
<i>Calyptorhynchus baudinii</i> - Baudin's Black-Cockatoo	Endangered birds	Vulnerable
<i>Calyptorhynchus latirostris</i> - Carnaby's Black-Cockatoo	Endangered birds	Endangered
<i>Zephyrarchaea mainae</i> - Main's Assassin Spider	Vulnerable invertebrate	

¹ DPAW Nature Maps data base (<https://naturemap.dpaw.wa.gov.au/default.aspx>) and DEE Protected Matters Search Tool (<http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf>)

2 DESKTOP ASSESSMENT

In completing the desktop assessment, the following was undertaken:

- Review of DPAW's NatureMaps (Appendix 1);
- Interrogation of DEE Database for Matters of National Environmental Significance (MNES) (Appendix 2); and
- A review of literature to assess the habitats present on site (vegetation).

2.1 WESTERN RINGTAIL POSSUM

The WRP has a patchy distribution from the Collie River to Two Peoples Bay in Western Australia, occurring most commonly in coastal or near coastal forest that includes Peppermint Tree (*Agonis flexuosa*) as a major component (Department of Environment, 2017a). The most inland population occurs at Perup and this is the only known population living in forest that does not contain Peppermint Tree. The species has been recorded as far north as Dawesville and as far east as Eucla. In the towns of Busselton and Dunsborough, some urban or developed areas support viable populations. Other populations in urban or semi-urban areas occur at Augusta and Albany (Jones *et al.* 1994). The post-1995 range of the WRP has been calculated at 7,155km² (DoE, 2017).

The diet of the WRP is not well understood (Gilfillan, 2008) because while it is generally accepted that the species occurs in vegetation dominated by *Agonis flexuosa*, it is sometimes found in areas that either do not contain *A. flexuosa*, or it occurs in low densities. Preferred habitat has been found to consist almost exclusively of myrtaceous plants: Peppermint, Marri and Jarrah (Jones *et al.*, 1994). All but one of the populations surveyed by Jones *et al.* (1994) was dominated by *A. flexuosa* (Perup). In urban areas possums feed on introduced garden species (Richardson 2005), and captive animals fed on peppermint leaves show a preference for fresh, young green leaves rather than red leaves (Ellis and Jones 1992). Throughout the WRP's range Jones *et al.* (1994) found that vegetation at all occupied sites belonged to one of three broad vegetation types defined as *A. flexuosa* forest (55% of occupied localities), eucalypt woodland or forest with a mid-storey of *A. flexuosa* (38% of occupied localities), and eucalypt woodland or forest without *A. flexuosa* (11% of occupied localities). Urban or semi-urban habitat occurred at 7% of occupied localities, but *A. flexuosa* was common or abundant in all such habitats. Jones *et al.* (1994) also found that the highest density populations were near-coastal, and associated with abundant Peppermint trees with a high continuity of either the canopy or mid-strata, and that many areas with abundant *A. flexuosa* did not support WRPs.

Processes threatening the occurrence and geographical extent of the species include clearing and habitat fragmentation, urbanisation, fox and cat predation, harvesting of plantation forests, altered fire regimes, road kill, drought, disease and competition with Brush-tail Possums (DoE, 2014a).

DPAW records (NatureMap) and discussion with DPAW Albany officers indicated that no records of WRP currently occur for the Goode Beach area.

2.2 CARNABY'S BLACK COCKATOO (*CALYPTORHYNCHUS LATIROSTRIS*)

The species is endemic to and widespread in the south-west of Western Australia and occurs mostly in the Wheatbelt (areas with between 300mm and 750mm of rainfall annually) and wetter regions

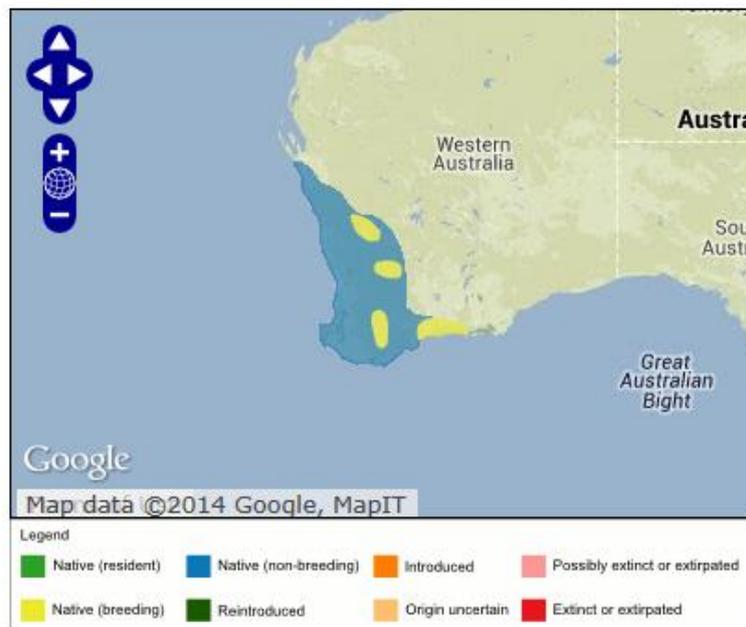
including the Swan Coastal Plain and South Coast (DoE, 2014b) and comprises an area between 32,000km² (DoE, 2014a) and 60, 525km² (DPaW, 2013).

Its habitat mostly comprises uncleared or remnant native eucalypt woodlands, especially those that contain Salmon Gum (*E. salmonophloia*) and Wandoo, and in shrubland or kwongan heathland dominated by *Hakea*, *Banksia* and *Grevillea* species.

Breeding habitat (or sites) encompasses those areas that contain suitable nest trees within the range of the species. Breeding activity is restricted to eucalypt woodlands mainly in the semiarid and subhumid interior (records from Three Springs District south to the Stirling Range, west to Cockleshell Gully and east to Manmanning) (DoE, 2014b). Breeding records indicate that this species is currently expanding its breeding range westward and south into the Jarrah-Marri forests of the Darling Scarp and into the Tuart (*E. gomphocephala*) forests of the Swan Coastal Plain, including Yanchep area, Lake Clifton and near Bunbury (DoE, 2014b).

The birds nest in large hollows in tall, living or dead eucalypts, mainly smooth-barked Salmon Gums and Wandoo, although other tree species have also been reported (DPaW, 2013). Suitable hollows can take from 120–150 years to develop. A map prepared by DEE using modelling techniques (Department of Sustainability, Environment, Water, Population and Communities, 2012) indicates that breeding Albany is within the breeding range of the species. However, Birdlife Australia (2014; Plate A) indicates that the birds are not known to breed in the Albany area but use the area for foraging and roosting in summer months. It is noted by DEE (Department of Sustainability, Environment, Water, Population and Communities, 2012) that birds may be starting to breed at new locations such as the Jarrah - Marri forests and coastal Tuart forest south of Perth (DPaW, 2013).

Plate A: Distribution of Carnaby's Cockatoo



Source: <http://www.birdlife.org/datazone/speciesfactsheet.php?id=1391>

During the non-breeding season, when most of the cockatoos migrate to the mid-west coast, Swan Coastal Plain and South Coast (DPaW, 2013), they roost in tall native or introduced eucalypts, and

occasionally in Marri and pines. Species known to be used for roosting include Flat-topped Yate (*E. occidentalis*), Salmon Gum, Wandoo, Karri, Blackbutt, Tuart, Blue Gum (*E. globulous*, introduced), *Pinus radiata* and *P. pinaster* (DoE, 2014b).

This species is threatened due to the high level of clearing of native vegetation in the Wheatbelt. Carnaby's black-cockatoos will traverse open space but may not use forage resources isolated from roosting habitat by long stretches of cleared agricultural land. A lack of connectivity between patches is "strongly implicated in the failure of Carnaby's cockatoo to survive in heavily cleared and fragmented rural landscapes" (DoE, 2014b). Corridors with breaks of less than 4 km between other foraging, commuting, breeding and roosting sites are considered important to allow the birds to move between areas.

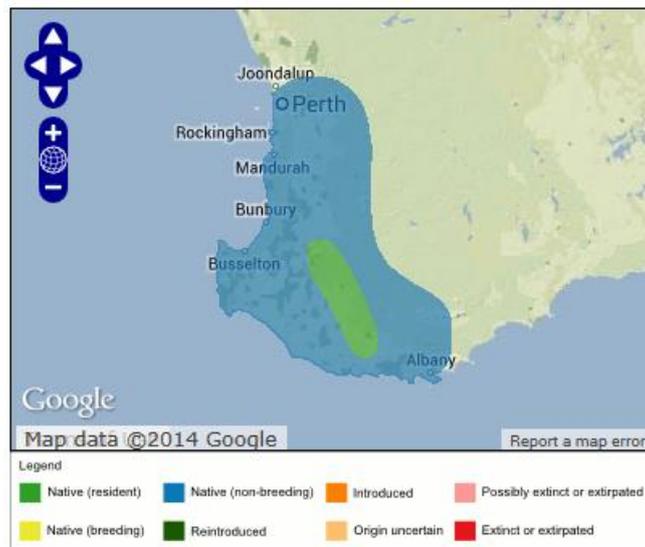
NatureMaps indicates that this species has been recorded in the Goode Beach area. The MNES database indicates that the area could contain habitat suitable for the species.

2.3 BAUDIN'S BLACK COCKATOO (*CALYPTORHYNCHUS BAUDINII*)

Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) is listed as Vulnerable under the *EPBC Act 1999* which means the species is facing a high risk of extinction in the wild (DoE, 2014c).

This Cockatoo is found only in the south-west of Western Australia and generally bounded by the 750mm rainfall isohyet (Albany, Gidgegannup and up to Mundaring and inland to the Stirling Ranges and Boyup Brook). Breeding has been recorded between Nornalup, northward to near Bridgetown, Lowden and Harvey (DoE, 2014c). Habitat comprises heavily forested areas dominated by Marri and other Eucalyptus species (particularly Karri and Jarrah). The distribution of the species comprises 40,000km² (DoE, 2014c) as shown in Plate B (Birdlife Australia, 2014).

Plate B: Distribution of Baudin's Black Cockatoo



Source: <http://www.birdlife.org/datazone/speciesfactsheet.php?id=1390>

Baudin's Cockatoo nests in hollows in mature trees such as Marri, Karri, Jarrah and Wandoo in the lower south-west of Western Australia (Department of Environment and Conservation, 2008). Breeding has been recorded in the far south of the range, in an area extending from Nornalup

northward to near Bridgetown, or sometimes further north to Lowden and Harvey (DoE, 2014c). Baudin's Black-Cockatoo roosts are generally located in the tallest trees in or near riparian environments or permanent water (DoE, 2014c).

Loss of habitat and forest management practices (not maintaining older trees) has previously impacted on the species. While the threat from habitat loss has largely abated in recent times (DoE, 2014c) there has been an ongoing decline in population numbers due to illegal shooting and competition for nesting hollows with feral bees, compounded by a low annual reproductive rate.

NatureMaps indicates that this species has been recorded in the Goode Beach area. The MNES database indicates that the area could contain habitat suitable for the species.

2.4 FOREST RED-TAILED BLACK-COCKATOO (*CALYPTORHYNCHUS BANKSII NASO*)

This sub-species is endemic to the south west of Western Australia and has been recorded from Gingin in the north and east to Mt Helena, Christmas Tree Well, West Dale (rarely to Brookton), North Bannister (rarely to Wandering) Mt Saddleback, Kojonup, Rocky Gully, upper King River and east to the Green Range (Department of Environment; DoE, 2014d). The current distribution is estimated to be 52,198km² (DoE, 2014d). The species inhabits dense Jarrah, Karri and Marri forests in areas that receive more than 600mm average rainfall annually (DoE, 2014d).

While there are no definitive maps of breeding areas, studies indicate that this cockatoo generally breeds in Marri, Jarrah, Blackbutt and Bullich (*E. megacarpa*) and Wandoo (DoE, 2014d). Nests are generally large, deep hollows with a broad floor and located high up in large 'veteran' trees. In Marri, the nest hollows of the Forest Red-tailed Black Cockatoo range from 8-14 m above ground, the entrance is 12–41 cm in diameter and the depth is 1-5 m (Department of Environment and Conservation, 2008).

Key threats to the Forest Red-tailed Black Cockatoo are habitat loss, nest hollow shortage and competition for available nest hollows from other species, injury or death from the European Honeybee (*Apis mellifera*), illegal shooting and fire (DoE, 2014c).

NatureMaps indicates that this species has been recorded in the Goode Beach area. The MNES database indicates that the area could contain habitat suitable for the species.

2.5 MAINS ASSASSIN SPIDER

Main's Assassin Spider is listed as a Schedule 1 species under the *Wildlife Conservation Act 1950*, as fauna that is rare or likely to become extinct. The species is known from only a narrow coastal strip on the south coast, from William Bay west of Denmark to Gull Rock east of Albany (Rix and Harvey, 2012).

Z. mainae requires a specific habitat within the undergrowth of moderately dense Peppermint (*Agonis*) stands. The subject land contains suitable habitat for *Z. mainae* (DPAW Albany pers. comm.). Due to the highly restricted distribution of this species, its status as a Schedule 1 species, and the suitability of the habitat within the site, a targeted site survey has been undertaken to determine if *Z. mainae* is present within the development footprint. Main's Assassin Spider favours peppermint (*Agonis*) coastal habitats where it inhabits shaded, long unburnt groves with an understorey of sedges (*Lepidosperma*), grasses and 'wiry' herbs (Restionaceae). Its microhabitat within these Peppermint groves is the

elevated leaf-litter layer which collects amongst the crowns, branches and foliage of the understorey plants (Rix and Harvey, 2012).

Discussions with DPAW Albany officers and Dr Mark Harvey of the Western Australian Museum indicate that the subject land could contain habitat suitable for Main's Assassin Spider.

2.6 VEGETATION MAPPING

Vegetation mapping and a flora survey have been undertaken (Alan Tingay and Associates, 1992). Vegetation mapping and flora nomenclature updating has been undertaken by Aurora Environmental (2017) and is shown in Appendix 3.

Vegetation of the subject land is associated with Peppermint low woodland (aLi) and scrub heath (aSZc) (Beard, 1981). The area was not included in the Albany Regional Vegetation Survey (ARVS; Sandiford and Barrett, 2010). However, Aurora has inferred that the vegetation aligns with a mosaic of ARVS units 2, 3 and 5 which comprises Peppermint low forest, coastal heath and coastal limestone heath. The proposed development will involve clearing up to 2.1 ha of ARVS mosaic units 2 and 3 (coastal heath and Peppermint low forest).

Vegetation mapping of the subject land identified five main vegetation zones, with distribution correlating with the underlying soil types of Quindalup dunes, relict dunes and peaty sand associated with Lake Vancouver (Alan Tingay and Associates, 1992). Vegetation is described as:

Foredunes (Quindalup)

The first dune system at the back of Goode Beach consists of a small foredune about 1m to 1.5m tall and 4m wide. The vegetation line closest to the beach, located at the base of the foredunes comprises *Cakile maritima*^{*2} and *Arctotheca populifolia*^{*}. On the top of the foredune strand species occur, dominated by *Euphorbia terracina*^{*} and *Spinifex hirsutus* with *Ficinia nodosa*, *Carpobrotus virescens* and *Cakile maritima*^{*}.

This vegetation type is not considered suitable habitat for WRP or black cockatoos due to lack of suitable foraging and shelter.

Quindalup Dunes

The seaward-facing slope of the first tall Quindalup Dunes contains a stunted *Adenanthos sericeus* low heath about 1-1.5m tall which is very dense in places. These shrubs have been wind-pruned by the salt laden sea breezes. At the dune crest and further west over the remainder of the Quindalup dunes the native peppermint (*Agonis flexuosa*) becomes co-dominant with the *Adenanthos* in an *Agonis flexuosa*, *Adenanthos sericeus* closed scrub. This vegetation type is dense and impenetrable with the dominant shrubs 3-4m tall, with 80-90% foliage cover arising from many individual stems and multi-stemmed plants. There is very little sub stratum under the shrubs due to the lack of light penetrating the dense overstorey. However, the ground is covered densely by the sedge *Desmocladus flexuosus* and to a lesser extent *Lepidosperma gladiatum* and *Ficinia nodosa*.

² * Introduced species.

This vegetation type is contained in the footprint proposed to be developed. It contains habitat potentially suitable for WRP. It is unlikely to contain breeding or roosting habitat for Black Cockatoos. Plant species found in this vegetation type are unlikely to provide foraging habitat for Black Cockatoos.

Peaty Sands

There is a relatively sharp boundary between the vegetation of the Quindalup dunes and the vegetation of the peaty sands associated with Lake Vancouver with two vegetation types associated with the soil type. Surrounding the water's edge is a narrow band (up to 20m wide) of *Leptocarpus trisepalus* sedgeland which is likely to experience long periods of inundation by fresh water. The *Leptocarpus* stands are about 1.5m tall and is relatively dense, which precludes most other species.

Further away from the lake's edge but still in swampy soils the vegetation comprises a *Melaleuca cuticularis/Banksia littoralis* low woodland with a low density of trees up to 6m tall over a 1m tall sedgeland of *Chaetanthus aristatus*, *L. trisepalus* and *Lepidosperma gladiatum*. *Callistachys lanceolata* is a common tall shrub throughout this vegetation type.

This vegetation type is considered to be marginal for WRP and not likely to be habitat for black cockatoos. This area is not part of the development foot print and will not be disturbed.

Relict Dunes

To the west of the Lake Vancouver vegetation types and the young Quindalup dune vegetation is a low heath dominated by *Melaleuca thymoides* occurring on Relict Dunes. The low heath is approximately 0.5m tall, dense and contains a different suite of species from the lake and Quindalup dune vegetation.

In the south-west corner of the subject land, the relict dune sands are mixed with colluvial sand derived from granite which is abundant immediately south of the lot boundary. In this area the low heath vegetation contains emergent trees of Jarrah (*Eucalyptus marginata*) and Peppermint (*Agonis flexuosa*).

This area will not be disturbed by the proposed development.

3 SCOPE OF WORK AND METHODS

The area of investigation included the extent of Lot 660, with a focus on the footprint of the proposed development. Surveys were undertaken by Melanie Price of Aurora Environmental, an experienced environmental scientist and zoologist.

3.1 FAUNA HABITAT ASSESSMENT

Vegetation, landform and soils units present at the subject site have been used to define broad fauna habitat types.

3.2 WESTERN RINGTAIL POSSUM SURVEY

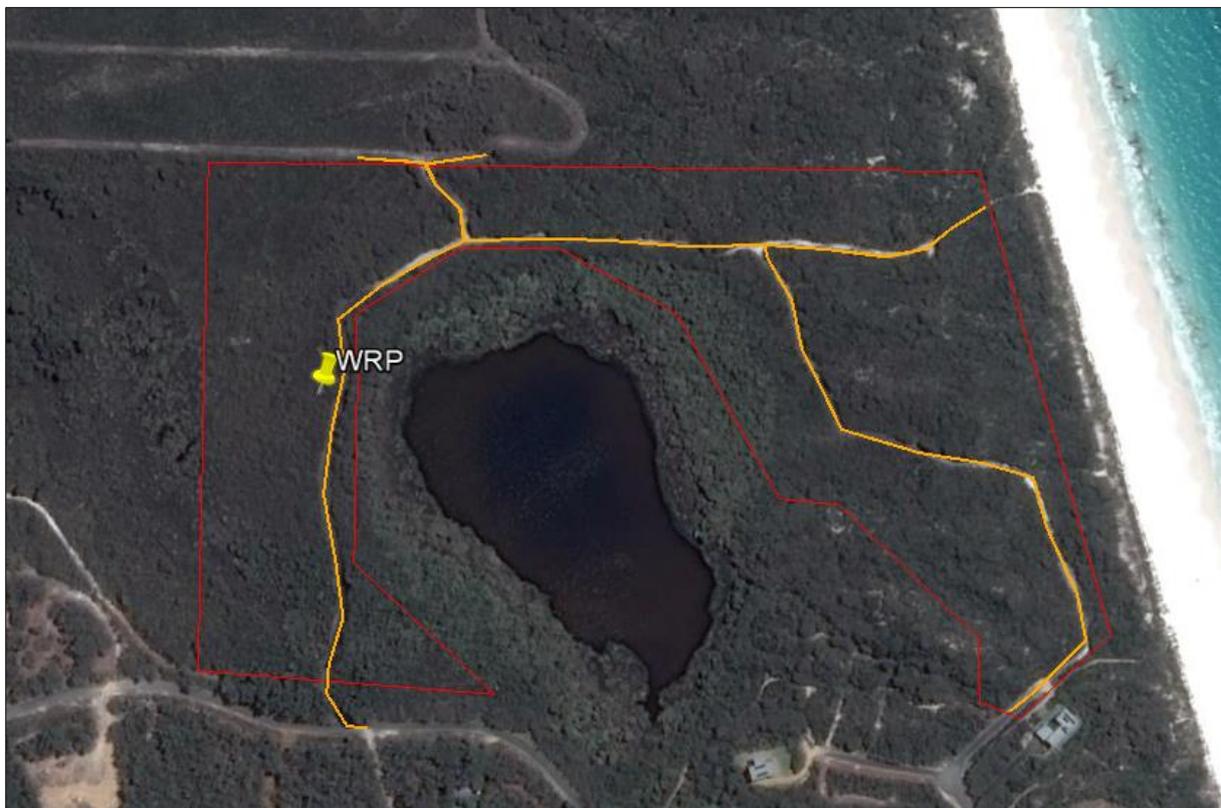
3.2.1 Daytime Survey

A day time survey to locate and record dreys, obvious tree hollows, scats and individual WRPs was carried out on the 6 December 2016. This involved traversing the study area on foot as shown in Appendix 4. The daytime conditions were clear, with no rain and a light breeze.

3.2.2 Night Time Survey

A night time survey to locate and record individual WRPs was carried out on the 6 December 2016. This involved searching along a survey line (tracks shown in Plate C) within the subject land, on foot using a LED head torch. The conditions were dry (no rain) with a light breeze.

PLATE C: AREA SURVEYED FOR WESTERN RINGTAIL POSSUM (NIGHT TIME)



3.2.3 Habitat Assessment

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

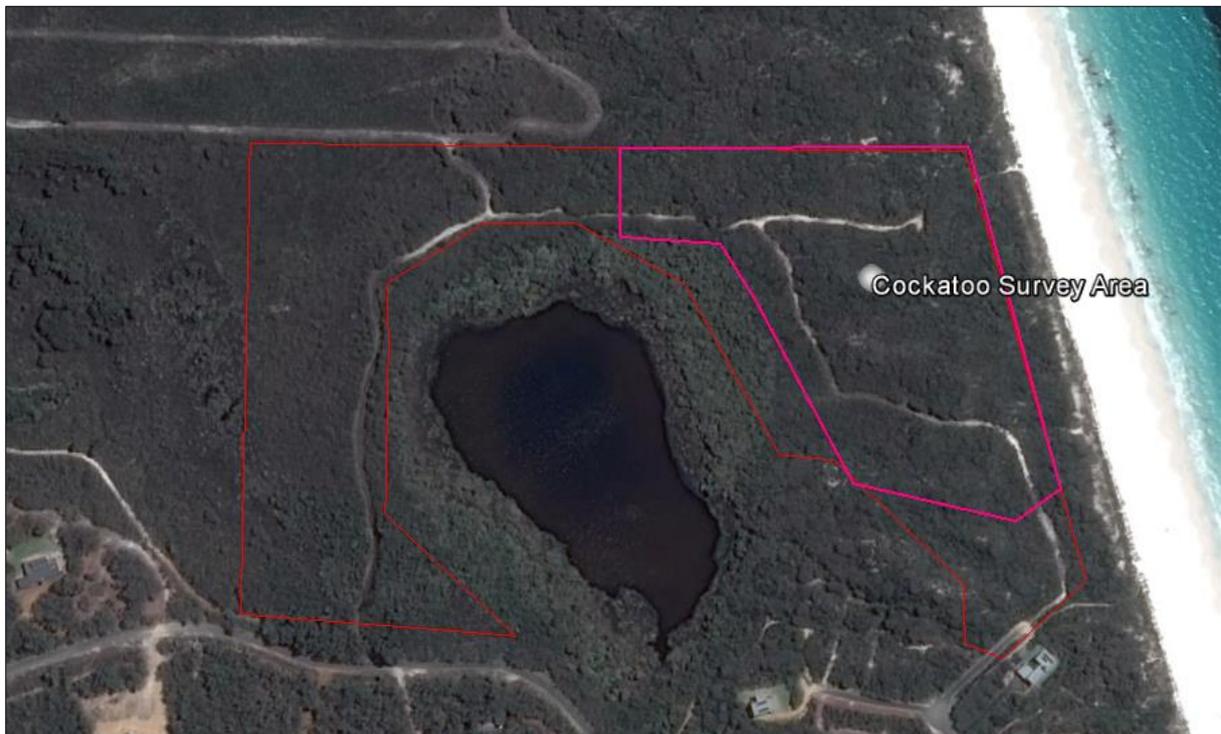
3.3 BLACK COCKATOO HABITAT ASSESSMENT

Habitat used by black cockatoos have been placed into three categories by DEE (DSEWPaC, 2012):

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

A habitat assessment of the area proposed to be cleared for development was carried out on 6 December 2016 (Plate D).

PLATE D: AREA SURVEYED FOR COCKATOO HABITAT



3.3.1 Breeding Habitat

Assessment of black cockatoo breeding habitat involves the identification of all suitable breeding trees species within the survey area that have a diameter at breast height (DBH) of over 50cm. If present, the DBH of each tree is estimated using a pre-made 50 cm tool. The location of each tree identified as being over the threshold DBH is recorded with a GPS and details on tree species, number and size of hollows (if any) noted. The location of trees observed to contain hollows (of any size/type) are recorded using a GPS. Target tree species include Marri, Jarrah and Flooded Gum or any other endemic *Corymbia/Eucalyptus* species of a suitable size that is present. Peppermints, *Banksia*, Sheoak and

Melaleuca tree species (for example) are not be assessed as they typically do not develop hollows that are used by black cockatoos.

For the purposes of this survey a tree containing a potential cockatoo nest hollow is defined as:

Generally, any tree which is alive or dead that contains one or more visible hollows (cavities within the trunk or branches) suitable for occupation by black cockatoo for the purpose of nesting/breeding. Hollows that had an entrance greater than about 12cm in diameter and would allow the entry of a black cockatoo into a suitably orientated and sized branch/trunk, will be recorded as a 'potential nest hollow'. Identified hollows are examined using binoculars for evidence of actual use by black cockatoos (e.g. chewing around hollow entrance, scarring and scratch marks on trunks and branches). The calls of chicks were also listened for, if a suitable hollow is present.

3.3.2 Foraging Habitat

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

3.3.3 Night Roosting Habitat

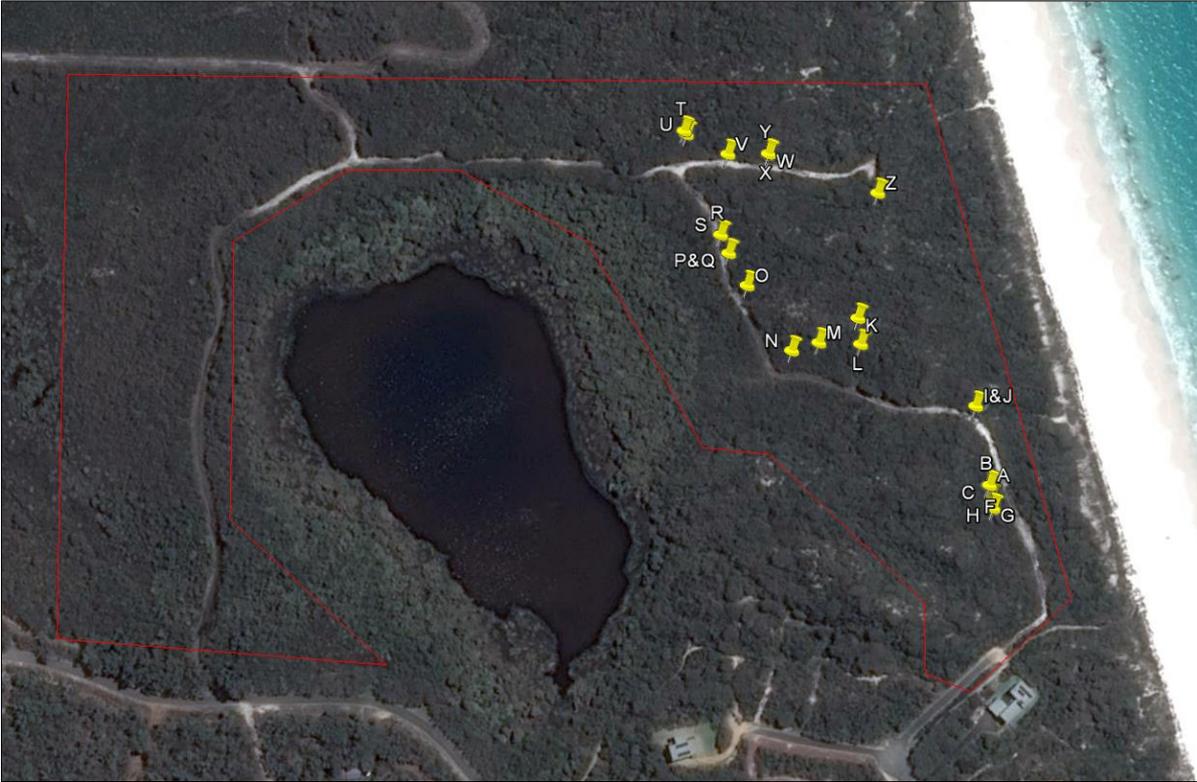
Direct and indirect evidence of black cockatoos roosting within trees on site is noted if observed (e.g. branch clippings, droppings or moulted feathers). This included a dusk survey prior to commencement of the nocturnal WRP survey aimed at observing any actual roosting activity.

3.4 MAIN'S ASSASSIN SPIDER

Twenty-six sites were sampled during the survey on 30 March 2017 (Plate E). Melanie Price has been trained by Dr Mark Harvey (WA Museum) in sampling techniques and the identification of Main's Assassin Spider.

At each sample location, a sieve on a sorting tray was placed beneath suspended leaf litter, with litter shaken into the tray and sorted to locate spiders. Spiders were examined using a jeweller's magnifying visor. No trapping or wet pit falling was conducted as part of this assessment. All fauna work was conducted according to DPAW licence number 08-000333-1 (Appendix 5).

PLATE E: SPIDER SAMPLING LOCATIONS



4 SURVEY CONSTRAINTS

Seasonal sampling has not been carried out as part of this fauna assessment. The conclusions presented are based on information from Western Australian and Commonwealth databases, discussion with officers from DPAW Albany, field data and the environmental monitoring carried out over a limited period of time. Therefore, the data and interpreted outcomes are indicative of the environmental conditions on the site at the time of the field assessment, as interpreted by an experienced zoologist. It is recognised that site conditions may change over time.

The number or presence/absence of WRPs observed during the nocturnal surveys represents the minimum number present within the area surveyed at the time of the survey. Due to various survey limitations, it is unlikely that every WRP present within the area was observed. The site is also open to the movement of WRP to and from nearby areas which may contain suitable habitat. As a consequence, some WRPs may have home ranges that overlap the boundary of the study area and as such, there is no guarantee that all WRPs that exist in the area utilised the survey area at the time of the nocturnal survey.

The black cockatoo habitat surveyed trees with hollows if they occurred within the survey area. Identifying hollows suitable for fauna species from ground level has limitations. Generally, the full characteristics of any hollow seen from the ground are not fully evident (e.g. internal dimensions). It is also difficult to locate all hollows within all trees as some are not observable from ground level. If present, hollows were inspected using a camera on a pole (within 5m of ground level). If present, the location of habitat trees was recorded using a handheld GPS. The accuracy of the coordinates obtained cannot be guaranteed below a level of 5 to 10m.

5 RESULTS AND CONCLUSION

5.1 FAUNA HABITAT

The vegetation present within the proposed clearing footprint of the subject land comprises AfAs - *Agonis flexuosa*/*Adenanthos sericeus* Closed Scrub (Appendix 3). As described by Alan Tingay and Associates (1992) and Aurora Environmental (2017), this vegetation type is dense with the dominant shrubs 3-4m tall, with 80-90% foliage cover arising from many individual stems and multi-stemmed plants. There is very little sub stratum under the shrubs due to the lack of light penetrating the dense overstorey. However, the ground is covered densely by the sedge *Desmocladus flexuosus* and to a lesser extent *Lepidosperma gladiatum* and *Ficinia nodosa*. The vegetation is in Excellent condition (Keighery, 1994) or Type 1 Residual (Thackway and Lesslie, 2006) with little to no evidence of weeds or other disturbance (Appendix 6). Photographs of the vegetation surveyed is shown in Plate F.

PLATE F: PHOTOGRAPHS OF HABITAT SURVEYED



Survey area within proposed development footprint - Peppermint (*Agonis flexuosa*)
Adenanthos sericeus Closed Scrub



Understorey



Understorey with sparse suspended leaf litter

5.2 WESTERN RINGTAIL POSSUM

During the daytime survey, no WRP dreys, scats or other evidence of WRP were identified within the subject land. No trees containing hollows were observed within the study area and it is noted that the area is dominated by relatively low coastal heath. Trees on the site comprise thickets of peppermint (*Agonis flexuosa*) with shrubs of woolly bush (*Adenanthos sericeus*). Forks in trees, cavities in tree trunks, fallen hollow logs, rabbit burrows and dense ground cover (where present) can also be used by

WRPs for daytime refuge and therefore observations of dreys and hollows only provide a guide to WRP habitat use/quality as other opportunities for daytime refuge may exist.

A single WRP was observed on the night survey on the western side of Lake Vancouver (Plate C). The WRP was observed in *Callistachys lanceolata*, approximately 2.5m above the ground.

Vegetation containing *Agonis flexuosa* and with a suitable dense structure (although not the low heath areas) is likely to be suitable for WRP. The vegetation proposed to be cleared for the development contains dense peppermint thickets.

The *Significant Impact Guidelines for the Vulnerable Western Ringtail Possum (Pseudocheirus occidentalis) in the Southern Swan Coastal Plain, WA* (Department of the Environment, Water Heritage and the Arts, 2009) indicates that if more than 0.5 ha of core, primary corridors or supporting habitat is proposed to be cleared, a referral to DEE should be made, to determine if the activity constitutes a controlled action under the EPBC Act. The clearing of 2.1 ha of potential habitat on the subject land triggers the need for referral.

5.3 BLACK COCKATOO HABITAT ASSESSMENT

5.3.1 Black Cockatoo Breeding Habitat

Trees considered potentially suitable for black cockatoos to use as nesting habitat (using DEE criteria – DSEWPac, 2012) were not observed within the subject land as it comprises coastal heath and low peppermint thickets. The vegetation assemblages present are not hollow forming.

5.3.2 Black Cockatoo Foraging Habitat

When nesting, black cockatoos will generally forage within a 6–12 km radius of their nesting site. Following breeding, birds assemble into flocks and move across the landscape searching for food, usually foraging within 6 km of a night roost. Because of this mobility, potential for reduced seed set and flowering due to drought, and the irregular or infrequent flowering and fruiting patterns of many of their food sources, large areas of foraging habitat are required to support black cockatoo populations. Table B indicates the preferred foraging habitat for each cockatoo species.

TABLE B: FORAGING DESCRIPTION FOR THREE SPECIES OF BLACK COCKATOO

Habitat	Baudin's	Carnaby's	Forest Red-tailed
Foraging	Eucalypt woodlands and forest, and proteaceous woodland and heath. During the breeding season feed primarily on native vegetation, particularly Marri (<i>Corymbia calophylla</i>). Outside the breeding season, may feed in fruit orchards (mostly apple and pear, but also persimmon) and tips of <i>Pinus</i> spp.	Native shrubland, kwongan heathland and woodland dominated by proteaceous plant species such as <i>Banksia</i> spp. (including <i>Dryandra</i> spp.), <i>Hakea</i> spp. and <i>Grevillea</i> spp. Forages in pine plantations (<i>Pinus</i> spp.), eucalypt woodland and forest that contains foraging species. Also individual trees and small stands of these species.	Jarrah and Marri woodlands and forest, and edges of Karri (<i>Eucalyptus diversicolor</i>) forests including Wandoo (<i>E. wandoo</i>) and Blackbutt (<i>E. patens</i>), within the range of the subspecies.

Source: Department of Sustainability, Environment, Water, Population and Communities, 2012

The vegetation of the proposed clearing area is in excellent condition, but contains few species which are likely to provide high quality foraging for the three species of black cockatoos. Popular foraging species such as Marri (*Corymbia calophylla*), Jarrah (*Eucalyptus marginata*), Sheoak (*Allocasuarina fraseriana*), Balga (*Xanthorrhoea species*) and *Banksia* species are absent in the development footprint. Other foraging species (i.e. Pine trees, *Hakea*, *Grevillea*, *Callistemon* and *Erodium*) are also absent from the development footprint.

5.3.3 Black Cockatoo Roosting Habitat

A review of available data (Peck *et al.*, 2016) indicates that there are two known roost sites for white tailed black cockatoos at Goode Beach (with other roost sites in the City of Albany at Robinson, Mt Clarence, Seppings, Kalgan, Cheynes, Mettler and McKail). Confirmed roost sites for Forest Red tailed Black Cockatoos occur at Kalgan and Torbay. The trees generally favoured by black cockatoos are included in Table C.

TABLE C: NIGHT ROOSTING HABITAT

Baudin’s	Carnaby’s	Forest Red-tailed
Generally in or near riparian environments or other permanent water sources. Jarrah, marri, flooded gum, Blackbutt <i>E. patens</i> , tuart, and introduced eucalypts including blue gum <i>E. globulus</i> , and lemon scented gum <i>Corymbia citriodora</i> .	Generally, in or near riparian environments or natural and artificial permanent water sources. Flat-topped yate <i>E. occidentalis</i> , salmon gum, wandoo, marri, karri, blackbutt, tuart, introduced eucalypts (for example blue gum) and introduced pines.	Tall jarrah, marri, blackbutt, tuart and introduced eucalypt trees within or on the edges of forests.

No potential roosting trees were identified in the study area during the survey.

The overall habitat assessment for the three species of Black Cockatoos indicates that the footprint of the area proposed to be cleared does not constitute significant habitat for breeding, roosting or foraging.

5.4 MAIN’S ASSASSIN SPIDER

A number of species of spider were observed and released during the site reconnaissance. However, none had features that were characteristic of Main’s Assassin Spider.

Main’s Assassin Spider favours peppermint (*Agonis*) coastal habitats where it inhabits shaded, long unburnt groves with an understorey of sedges (*Lepidosperma*), grasses and ‘wiry’ herbs (Restionaceae). Its microhabitat within these Peppermint groves is the elevated leaf-litter layer which collects amongst the crowns of the understorey plants (Rix and Harvey, 2009). While this habitat type is present on the subject land, the suspended leaf litter was sparse (compared to areas where the spider is relatively common, such as the Sandpatch Windfarm).

The survey indicates that Main’s Assassin Spider is unlikely to occur within the area proposed to be cleared for development.

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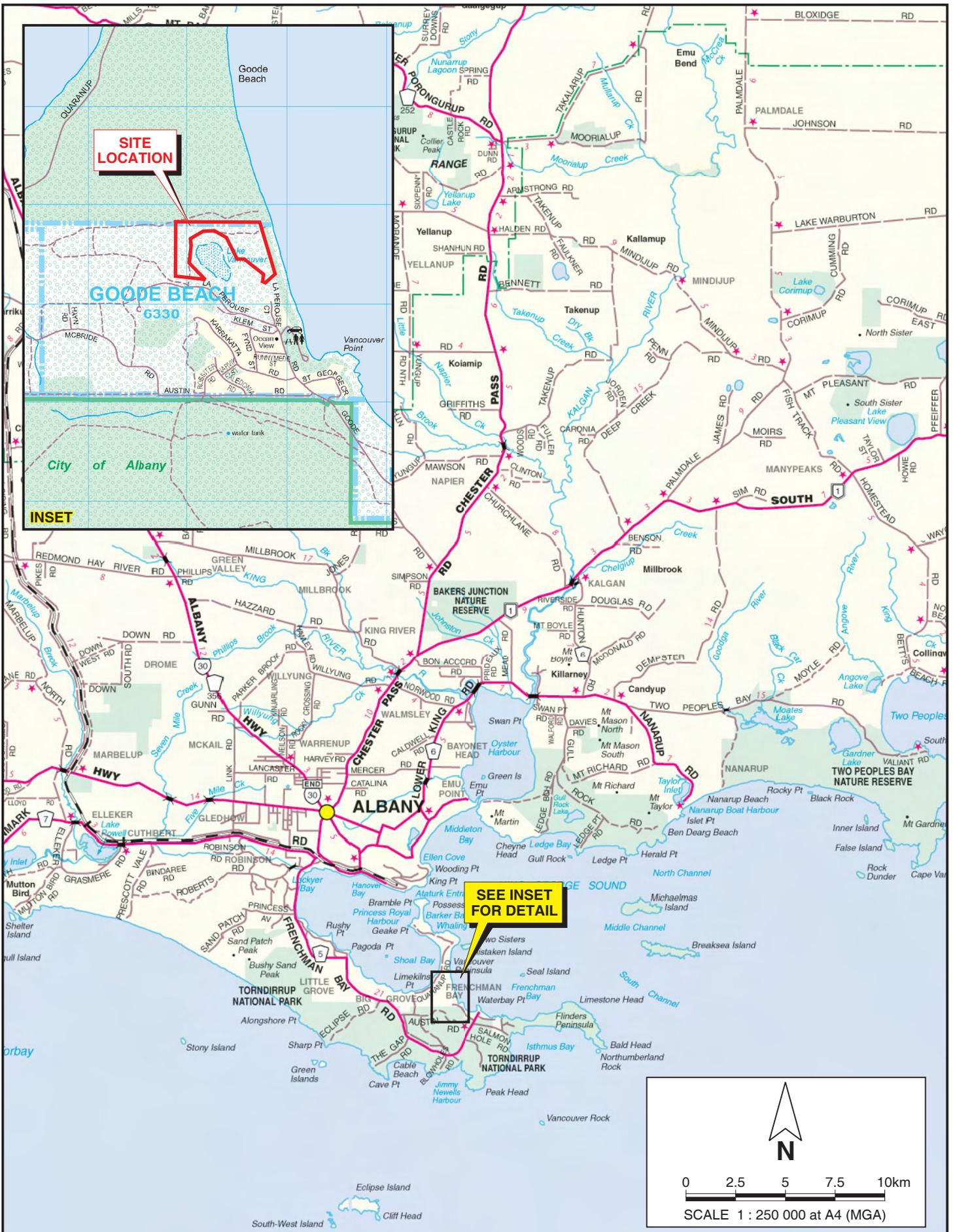
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FIGURES



CHE2016-002_REPT_001_mp-001.dgn
 PINPOINT CARTOGRAPHICS (08) 9562 7136



Cherry Martin
 ENVIRONMENTAL ASSESSMENT - VANCOUVER BEACH RESORT
 LOT 40 LA PEROUSE COURT - GOODE BEACH, CITY OF ALBANY, WA

Figure 1

REGIONAL LOCATION

Drawn: M. Price Date: 7 Feb 2017

Job: CHE2016-002

APPENDIX 1

NatureMap Search Report

NatureMap Species Report

Created By Guest user on 19/05/2017

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 117° 56' 05" E, 35° 05' 01" S
Buffer 2km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	293	3568
Priority 1	1	2
Priority 2	1	1
Priority 3	2	3
Priority 4	5	11
Protected under international agreement	4	8
Rare or likely to become extinct	6	99
TOTAL	312	3692

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Rare or likely to become extinct				
1.	1854 <i>Banksia verticillata</i> (Albany Banksia)		T	
2.	24733 <i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo (long-billed black-cockatoo), Baudin's Cockatoo)		T	
3.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)		T	
4.	2242 <i>Isopogon uncinatus</i>		T	
5.	24097 <i>Parantechinus apicalis</i> (Dibbler)		T	
6.	24145 <i>Setonix brachyurus</i> (Quokka)		T	
Protected under international agreement				
7.	25558 <i>Ardea ibis</i> (Cattle Egret)		IA	
8.	41324 <i>Ardea modesta</i> (Eastern Great Egret)		IA	
9.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
10.	24383 <i>Pluvialis squatarola</i> (Grey Plover)		IA	
Priority 1				
11.	17049 <i>Thomasia purpurea</i> x <i>solanacea</i>		P1	
Priority 2				
12.	2790 <i>Gyrostemon thesioides</i>		P2	
Priority 3				
13.	35396 <i>Poa billardierei</i>		P3	
14.	2327 <i>Synaphea preissii</i>		P3	
Priority 4				
15.	16876 <i>Adenanthos</i> x <i>cunninghamii</i>		P4	
16.	24153 <i>Isodon obesulus</i> subsp. <i>fusciventer</i> (Quenda, Southern Brown Bandicoot)		P4	
17.	1302 <i>Laxmannia jamesii</i> (James' Paperlily)		P4	
18.	5096 <i>Thomasia quercifolia</i> (Oak Leaved Thomasia)		P4	
19.	5100 <i>Thomasia solanacea</i>		P4	
Non-conservation taxon				
20.	15429 <i>Acacia alata</i> var. <i>alata</i>			
21.	3363 <i>Acacia hastulata</i>			
22.	3413 <i>Acacia leioderma</i>			
23.	3424 <i>Acacia littorea</i>			
24.	35624 <i>Acacia pentadenia</i> subsp. <i>pentadenia</i>			
25.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
26.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
27.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
28.	6203 <i>Actinotus glomeratus</i>			
29.	1791 <i>Adenanthos obovatus</i> (Basket Flower)			
30.	11685 <i>Adenanthos sericeus</i> subsp. <i>sericeus</i> (Coastal Woollybush)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
31.	24301 <i>Aegotheles cristatus</i> subsp. <i>cristatus</i> (Australian Owlet-nightjar)			
32.	5316 <i>Agonis flexuosa</i> (Peppermint, Wonil)			
33.	17202 <i>Agonis flexuosa</i> var. <i>flexuosa</i>			
34.	185 <i>Aira cupaniana</i> (Silvery Hairgrass)	Y		
35.	13908 <i>Allocasuarina lehmanniana</i> subsp. <i>lehmanniana</i>			
36.	<i>Amblyomma fimbriatum</i>			
37.	4585 <i>Amperea ericoides</i>			
38.	4588 <i>Amperea volubilis</i>			
39.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
40.	6306 <i>Andersonia caerulea</i> (Foxtails)			
41.	25844 <i>Andersonia caerulea</i> subsp. <i>caerulea</i>			
42.	6317 <i>Andersonia micrantha</i>			
43.	6321 <i>Andersonia sprengelioides</i>			
44.	<i>Anoplocapros lenticularis</i>			
45.	11505 <i>Anthocercis viscosa</i> subsp. <i>viscosa</i>			
46.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
47.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
48.	12040 <i>Apium prostratum</i> var. <i>prostratum</i> (Sea Celery)			
49.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
50.	<i>Araneus cyphoxis</i>			
51.	<i>Argiope trifasciata</i>			
52.	61 <i>Asplenium aethiopicum</i> (Forked Spleenwort)			
53.	7850 <i>Asteridea nivea</i>			
54.	6323 <i>Astroloma ciliatum</i> (Candle Cranberry)			
55.	32525 <i>Banksia formosa</i> (Showy Dryandra)			
56.	1822 <i>Banksia ilicifolia</i> (Holly-leaved Banksia)			
57.	1830 <i>Banksia littoralis</i> (Swamp Banksia, Pungura)			
58.	<i>Barnardius zonarius</i>			
59.	747 <i>Baumea rubiginosa</i>			
60.	748 <i>Baumea vaginalis</i> (Sheath Twigrush)			
61.	3713 <i>Bossiaea linophylla</i>			
62.	14291 <i>Bossiaea praetermissa</i>			
63.	26518 <i>Botryocladia sonderi</i>			
64.	46733 <i>Brachyloma baxteri</i>			
65.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
66.	10861 <i>Callistachys lanceolata</i> (Wonnich)			
67.	5394 <i>Callistemon glaucus</i>			
68.	31103 <i>Caloplaca gallowayi</i>			
69.	2957 <i>Cassytha racemosa</i> (Dodder Laurel)			
70.	1125 <i>Centrolepis drummondiana</i>			
71.	3148 <i>Cephalotus follicularis</i> (Albany Pitcher Plant)			
72.	17685 <i>Chaetanthus aristatus</i>			
73.	24187 <i>Chalinolobus morio</i> (Chocolate Wattled Bat)			
74.	1280 <i>Chamaescilla corymbosa</i> (Blue Squill)			
75.	5491 <i>Chamelaucium ciliatum</i>			
76.	1513 <i>Chasmanthe floribunda</i> (African Cornflag)	Y		
77.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
78.	4448 <i>Chorilaena quercifolia</i> (Chorilaena)			
79.	3754 <i>Chorzema diversifolium</i>			
80.	24980 <i>Christinus marmoratus</i> (Marbled Gecko)			
81.	<i>Chroicocephalus novaehollandiae</i>			
82.	24431 <i>Chrysococcyx basalis</i> (Horsfield's Bronze Cuckoo)			
83.	24432 <i>Chrysococcyx lucidus</i> subsp. <i>plagosus</i> (Shining Bronze Cuckoo)			
84.	24288 <i>Circus approximans</i> (Swamp Harrier)			
85.	28205 <i>Cladonia capitellata</i> var. <i>capitellata</i>			
86.	27692 <i>Cladonia rigida</i>			
87.	2929 <i>Clematis pubescens</i> (Common Clematis)			
88.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
89.	4554 <i>Comesperma flavum</i>			
90.	4564 <i>Comesperma virgatum</i> (Milkwort)			
91.	40863 <i>Commersonia corylifolia</i> (Hazel-leaved Rulingia)			
92.	11826 <i>Conostylis aculeata</i> subsp. <i>aculeata</i>			
93.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
94.	<i>Cormocephalus hartmeyer</i>			
95.	25592 <i>Corvus coronoides</i> (Australian Raven)			
96.	6352 <i>Cosmelia rubra</i> (Spindle Heath)			
97.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
98.	24673 <i>Coturnix ypsilophora</i> subsp. <i>australis</i> (Brown Quail)			
99.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
100.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
101.	3142 <i>Crassula natans</i>	Y		
102.	25398 <i>Crinia georgiana</i> (Quacking Frog)			
103.	4451 <i>Crocea angustifolia</i> (Crowea)			
104.	25049 <i>Ctenotus labillardieri</i>			
105.	13732 <i>Cuscuta campestris</i> (Golden dodder)	Y		
106.	26725 <i>Cystophora polycystidea</i>			Y
107.	26729 <i>Cystophora subfarcinata</i>			
108.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
109.	7439 <i>Dampiera fasciculata</i> (Bundled-leaf Dampiera)			
110.	5508 <i>Darwinia citriodora</i> (Lemon-scented Darwinia)			
111.	5510 <i>Darwinia diosmoides</i>			
112.	3835 <i>Daviesia preissii</i>			
113.	24052 <i>Delphinus delphis</i> (Common Dolphin)			
114.	16595 <i>Desmocladus flexuosus</i>			
115.	7487 <i>Diaspasis filifolia</i> (Thread-leaved Diaspasis)			
116.	<i>Dingosa serrata</i>			
117.	<i>Diodon holocanthus</i>			
118.	11049 <i>Diuris corymbosa</i>			
119.	13200 <i>Drosera enodes</i>			
120.	13218 <i>Drosera erythrogyne</i>			
121.	3117 <i>Drosera paleacea</i> (Dwarf Sundew)			
122.	3118 <i>Drosera pallida</i> (Pale Rainbow)			
123.	13186 <i>Drosera roseana</i>			
124.	8914 <i>Drosera sulphurea</i> (Sulphur-flowered Sundew)			
125.	25251 <i>Echiopsis curta</i> (Bardick)			
126.	25096 <i>Egernia kingii</i> (King's Skink)			
127.	<i>Egretta novaehollandiae</i>			
128.	48247 <i>Elachista nigra</i>	Y		
129.	<i>Elanus axillaris</i>			
130.	25250 <i>Elapognathus coronatus</i> (Crowned Snake)			
131.	<i>Eolophus roseicapillus</i>			
132.	24652 <i>Eopsaltria georgiana</i> (White-breasted Robin)			
133.	13866 <i>Eriochilus pulchellus</i>			
134.	<i>Eriophora biapicata</i>			
135.	5625 <i>Eucalyptus diversicolor</i> (Karri)			
136.	5709 <i>Eucalyptus megacarpa</i> (Bullich, Pulidj)			
137.	24818 <i>Eudyptula minor</i> subsp. <i>novaehollandiae</i> (Little Penguin)			
138.	4636 <i>Euphorbia paralias</i> (Sea Spurge)	Y		
139.	20214 <i>Eutaxia myrtifolia</i>			
140.	25621 <i>Falco berigora</i> (Brown Falcon)			
141.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
142.	48244 <i>Feldmannia mitchelliae</i>			
143.	27745 <i>Flavoparmelia haysomii</i>			
144.	1944 <i>Franklandia fucifolia</i> (Lanoline Bush)			
145.	24765 <i>Gallirallus philippensis</i> subsp. <i>mellori</i> (Buff-banded Rail)			
146.	20490 <i>Gastrolobium coriaceum</i>			
147.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
148.	47962 <i>Glyciphila melanops</i> (Tawny-crowned Honeyeater)			
149.	10909 <i>Gompholobium confertum</i>			
150.	29362 <i>Goodenia coerulea</i>			
151.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
152.	2787 <i>Gyrostemon sheathii</i>			
153.	25627 <i>Haematopus fuliginosus</i> (Sooty Oystercatcher)			
154.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			
155.	2137 <i>Hakea ceratophylla</i> (Horned Leaf Hakea)			
156.	2156 <i>Hakea elliptica</i> (Oval-leaf Hakea)			
157.	2191 <i>Hakea oleifolia</i> (Dungyn)			
158.	2203 <i>Hakea ruscifolia</i> (Candle Hakea)			
159.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
160.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
161.	25117 <i>Hemiergis peronii</i> subsp. <i>peronii</i>			
162.	27777 <i>Heterodermia obscurata</i>			
163.	<i>Heterodontus portusjacksoni</i>			
164.	5117 <i>Hibbertia cuneiformis</i> (Cutleaf Hibbertia)			
165.	5126 <i>Hibbertia furfuracea</i>			
166.	5132 <i>Hibbertia grossulariifolia</i>			
167.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
168.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
169.	43384 <i>Hydrophis platurus</i> (Yellow-bellied Seasnake)			
170.	<i>Hydroprogne caspia</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
171.	24211 <i>Hydrurga leptonyx</i> (Leopard Seal)			
172.	<i>Isopeda leishmanni</i>			
173.	45301 <i>Jackelixa ligulata</i>			
174.	4017 <i>Jacksonia horrida</i>			
175.	1186 <i>Juncus microcephalus</i>	Y		
176.	4037 <i>Kennedia coccinea</i> (Coral Vine)			
177.	467 <i>Lagurus ovatus</i> (Hare's Tail Grass)	Y		
178.	25638 <i>Larus pacificus</i> (Pacific Gull)			
179.	4049 <i>Latrobea diosmifolia</i>			
180.	<i>Latrodictus hasseltii</i>			
181.	<i>Lepidoblennius marmoratus</i>			
182.	43041 <i>Lepilaena marina</i>			
183.	1653 <i>Leporella fimbriata</i> (Hare Orchid)			
184.	1080 <i>Leptocarpus scariosus</i>			
185.	2355 <i>Leptomeria squarrolosa</i>			
186.	<i>Lethocolea pansa</i>			
187.	16449 <i>Leucophyta brownii</i>			
188.	6396 <i>Leucopogon glabellus</i>			
189.	6399 <i>Leucopogon gracilis</i>			
190.	40940 <i>Leucopogon obovatus</i> subsp. <i>obovatus</i>			
191.	40941 <i>Leucopogon obovatus</i> subsp. <i>revolutus</i>			
192.	6425 <i>Leucopogon oxycedrus</i>			
193.	6427 <i>Leucopogon parviflorus</i> (Coast Beard-heath)			
194.	34718 <i>Leucopogon</i> sp. Southern Forests (B.G. Hammersley 1000)			
195.	7677 <i>Levenhookia stipitata</i> (Common Stylewort)			
196.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
197.	7403 <i>Lobelia heterophylla</i> (Wing-seeded Lobelia)			
198.	1232 <i>Lomandra micrantha</i> (Small-flower Mat-rush)			
199.	<i>Lophoictinia isura</i>			
200.	12783 <i>Lycopodiella serpentina</i>			
201.	18049 <i>Lyginia imberbis</i>			
202.	34736 <i>Lysinema pentapetalum</i>			
203.	25650 <i>Malurus elegans</i> (Red-winged Fairy-wren)			
204.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
205.	15993 <i>Melaleuca pentagona</i> var. <i>pentagona</i>			
206.	5980 <i>Melaleuca thymoides</i>			
207.	<i>Menneus wa</i>			
208.	<i>Missulena granulosa</i>			
209.	25240 <i>Morelia spilota</i> subsp. <i>imbricata</i> (Carpet Python)			
210.	<i>Nanometa gentilis</i>			
211.	6464 <i>Needhamiella pumilio</i>			
212.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
213.	24739 <i>Neophema petrophila</i> (Rock Parrot)			
214.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
215.	<i>Omegophora armilla</i>			
216.	46315 <i>Orianthera serpyllifolia</i> subsp. <i>serpyllifolia</i>			
217.	24693 <i>Pachyptila desolata</i> (Antarctic Prion)			
218.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
219.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
220.	30472 <i>Patersonia occidentalis</i> var. <i>occidentalis</i>			
221.	24674 <i>Pavo cristatus</i> (Common Peafowl, Indian Peafowl)	Y		
222.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
223.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
224.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
225.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
226.	25587 <i>Phaps elegans</i> (Brush Bronzewing)			
227.	48071 <i>Phylidonyris niger</i> (White-cheeked Honeyeater)			
228.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
229.	4 <i>Phylloglossum drummondii</i> (Pigmy Clubmoss)			
230.	<i>Phyllopteryx taeniolatus</i>			
231.	<i>Phytophthora cinnamomi</i>			
232.	5239 <i>Pimelea clavata</i>			
233.	5243 <i>Pimelea ferruginea</i>			
234.	5249 <i>Pimelea hispida</i> (Bristly Pimelea)			
235.	11533 <i>Pimelea imbricata</i> var. <i>imbricata</i>			
236.	18117 <i>Pimelea rosea</i> subsp. <i>rosea</i>			
237.	5269 <i>Pimelea sylvestris</i>			
238.	42260 <i>Pithocarpa ramosa</i>			
239.	25720 <i>Platycercus icterotis</i> (Western Rosella)			
240.	6249 <i>Platysace compressa</i> (Tapeworm Plant)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
241.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
242.	<i>Poltys laciniosus</i>			
243.	44084 <i>Prasophyllum</i> sp. early (G. Brockman GBB 1626)			
244.	<i>Pseudocalliurichthys goodladi</i>			
245.	27997 <i>Pseudocyphellaria neglecta</i>			
246.	25710 <i>Pterodroma macroptera</i> (Great-winged Petrel)			
247.	1698 <i>Pterostylis vittata</i> (Banded Greenhood)			
248.	28286 <i>Pultenaea heterochila</i>			
249.	4181 <i>Pultenaea reticulata</i>			
250.	<i>Purpureicephalus spurius</i>			
251.	<i>Pycnothea flynni</i>			
252.	<i>Ranzania laevis</i>			
253.	18547 <i>Rhadinothamnus anceps</i>			
254.	2578 <i>Rhagodia baccata</i> (Berry Saltbush)			
255.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
256.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
257.	6027 <i>Rinzia schollerifolia</i> (Cranberry Rinzia)			
258.	20495 <i>Rubus loganobaccus</i>	Y		
259.	27249 <i>Sargassum linearifolium</i>			
260.	27258 <i>Sargassum spinuligerum</i>			
261.	27262 <i>Sargassum verruculosum</i>			
262.	<i>Saurida grandisquamis</i>			
263.	7626 <i>Scaevola nitida</i> (Shining Fanflower)			
264.	970 <i>Schoenus acuminatus</i>			
265.	979 <i>Schoenus caespititius</i>			
266.	996 <i>Schoenus laevigatus</i>			
267.	19946 <i>Schoenus</i> sp. South coast (R. Davis 10239)			
268.	8204 <i>Senecio elegans</i> (Purple Groundsel)	Y		
269.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
270.	25515 <i>Sminthopsis griseoventer</i> (Grey-bellied Dunnart)			
271.	4202 <i>Sphaerolobium fornicatum</i>			
272.	4211 <i>Sphaerolobium vimineum</i> (Leafless Globe Pea)			
273.	31952 <i>Sphenotoma gracilis</i> (Swamp Paper-heath)			
274.	31951 <i>Sphenotoma parviflora</i>			
275.	4828 <i>Spyridium globulosum</i> (Basket Bush)			
276.	24645 <i>Stagonopleura oculata</i> (Red-eared Firetail)			
277.	25655 <i>Stipiturus malachurus</i> (Southern Emu-wren)			
278.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
279.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
280.	7695 <i>Stylidium caespitosum</i> (Fly-away Triggerplant)			
281.	7733 <i>Stylidium glaucum</i> (Grey Triggerplant)			
282.	7785 <i>Stylidium repens</i> (Matted Triggerplant)			
283.	7799 <i>Stylidium spathulatum</i> (Creamy Triggerplant)			
284.	25804 <i>Stylidium thryonides</i>			
285.	7808 <i>Stylidium violaceum</i> (Violet Triggerplant)			
286.	24167 <i>Tarsipes rostratus</i> (Honey Possum, Noolbenger)			
287.	4256 <i>Templetonia retusa</i> (Cockies Tongues)			
288.	2820 <i>Tetragonia decumbens</i> (Sea Spinach)	Y		
289.	2823 <i>Tetragonia implexicoma</i> (Bower Spinach)			
290.	2824 <i>Tetragonia tetragonoides</i> (New Zealand Spinach)			
291.	<i>Thalasseus bergii</i>			
292.	20731 <i>Thelymitra vulgaris</i>			
293.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
294.	4548 <i>Tremandra stelligera</i>			
295.	33438 <i>Trymalium odoratissimum</i> subsp. <i>trifidum</i>			
296.	<i>Upeneichthys lineatus</i>			
297.	7145 <i>Utricularia menziesii</i> (Redcoats)			
298.	7148 <i>Utricularia multifida</i>			
299.	7158 <i>Utricularia volubilis</i> (Twining Bladderwort)			
300.	25225 <i>Varanus rosenbergi</i> (Heath Monitor)			
301.	15618 <i>Verticordia plumosa</i> var. <i>plumosa</i>			
302.	6939 <i>Westringia dampieri</i>			
303.	1394 <i>Wurmbea dioica</i> (Early Nancy)			
304.	28144 <i>Xanthoparmelia isidiigera</i>			
305.	28159 <i>Xanthoparmelia neotinctina</i>			
306.	29036 <i>Xanthoparmelia pulla</i>			
307.	6289 <i>Xanthosia huegelii</i>			
308.	6292 <i>Xanthosia rotundifolia</i> (Southern Cross)			
309.	1144 <i>Xyris flexifolia</i>			
310.	1149 <i>Xyris lacera</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
311.	1150 <i>Xyris lanata</i>			
312.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereeye)			

Conservation Codes

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

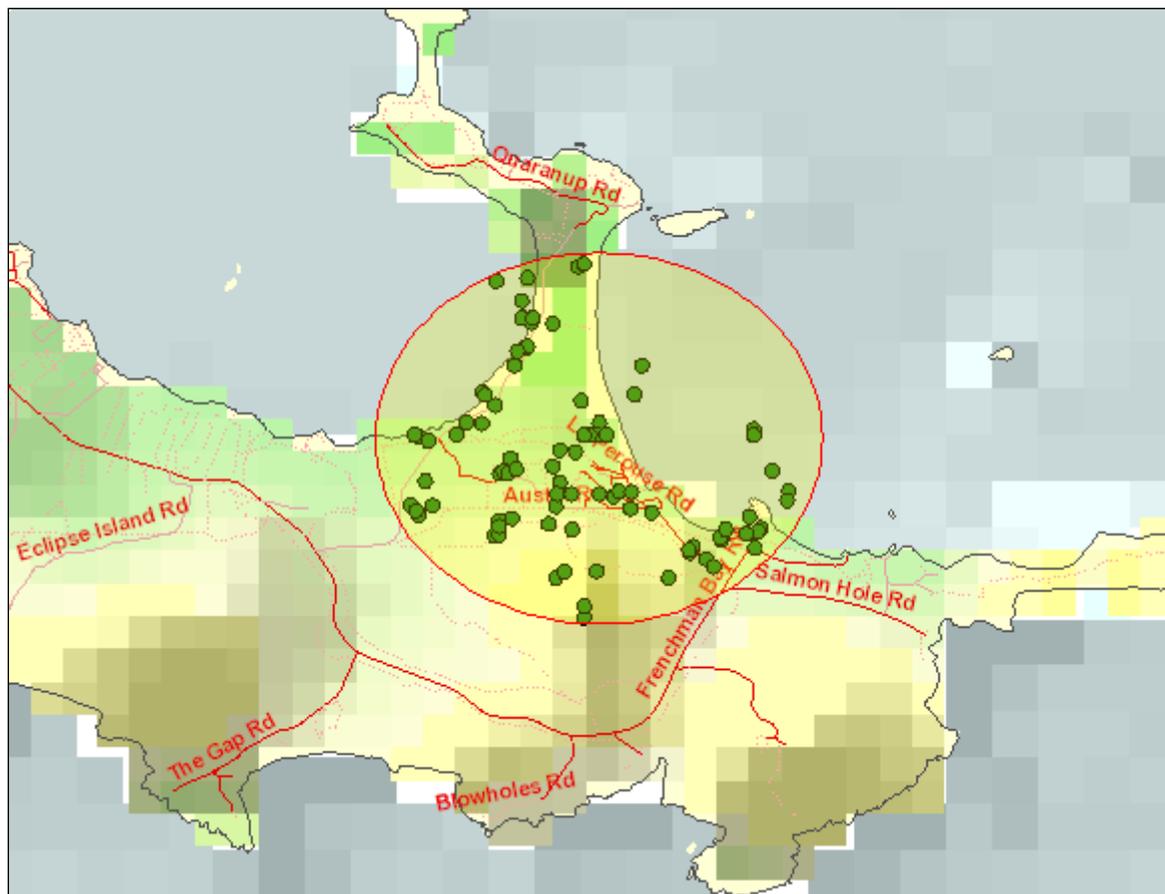
¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records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

NatureMap

Mapping Western Australia's biodiversity

Printed by Guest user on 19/5/2017

Query details : Current Names Only=Yes; Core Datasets Only=Yes; Method='By Circle'; Centre=117° 56' 05" E,35° 05' 01" S; Buffer=2km;



Search Results

Selected

- Selected Species

All Results

- Non-conservation taxon
- Priority 1
- Priority 2
- Priority 3
- Priority 4
- Protected under international agreement
- Rare or likely to become extinct

Reference Layers

Major WA Towns

-

Roads

- Sealed
- Unsealed
- Track

State Borders

-

Australian Continent

-



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

APPENDIX 2

Protected Matters Search Tool



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: 03/11/16 14:46:24

[Summary](#)

[Details](#)

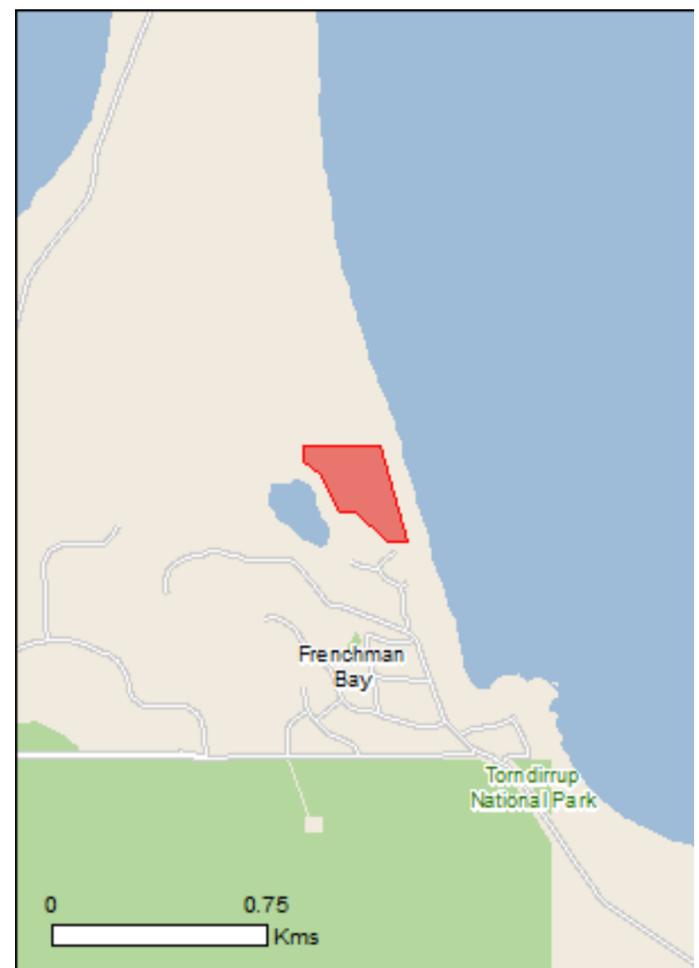
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

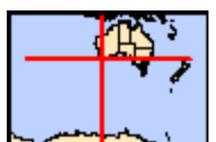
[Acknowledgements](#)



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

[Coordinates](#)

Buffer: 0.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	25
Listed Migratory Species:	14

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:	21
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	17
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area
Calyptorhynchus baudinii Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-Cockatoo [769]	Vulnerable	Breeding known to occur within area
Calyptorhynchus latirostris Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Cereopsis novaehollandiae grisea Cape Barren Goose (south-western), Recherche Cape Barren Goose [25978]	Vulnerable	Species or species habitat may occur within area
Dasyornis longirostris Western Bristlebird [515]	Vulnerable	Species or species habitat likely to occur within area
Diomedea epomophora (sensu stricto) Southern Royal Albatross [1072]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur

Name	Status	Type of Presence within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding likely to occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Mammals		
Dasyurus geoffroi Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Vulnerable	Species or species habitat may occur within area
Plants		
Banksia brownii Brown's Banksia, Feather-leaved Banksia [8277]	Endangered	Species or species habitat likely to occur within area
Caladenia harringtoniae Harrington's Spider-orchid, Pink Spider-orchid [56786]	Vulnerable	Species or species habitat likely to occur within area
Isopogon uncinatus Hook-leaf Isopogon [20871]	Endangered	Species or species habitat known to occur within area
Kennedia glabrata Northcliffe Kennedia [16452]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Diomedea epomophora (sensu stricto) Southern Royal Albatross [1072]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Thalassarche cauta (sensu stricto) Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Foraging, feeding or related behaviour likely

Name	Threatened	Type of Presence
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	to occur within area Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species	[Resource Information]	
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Cereopsis novaehollandiae grisea Cape Barren Goose (south-western), Recherche Cape Barren Goose [25978]	Vulnerable	Species or species habitat may occur within area
Diomedea epomophora (sensu stricto) Southern Royal Albatross [1072]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Thalassarche cauta (sensu stricto) Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat likely to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area

Extra Information

Invasive Species

[[Resource Information](#)]

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

Name	Status	Type of Presence
Birds		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Mammals		
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Sage, Wild Sage [10892]		
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
Ulex europaeus		
Gorse, Furze [7693]		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.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

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

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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:

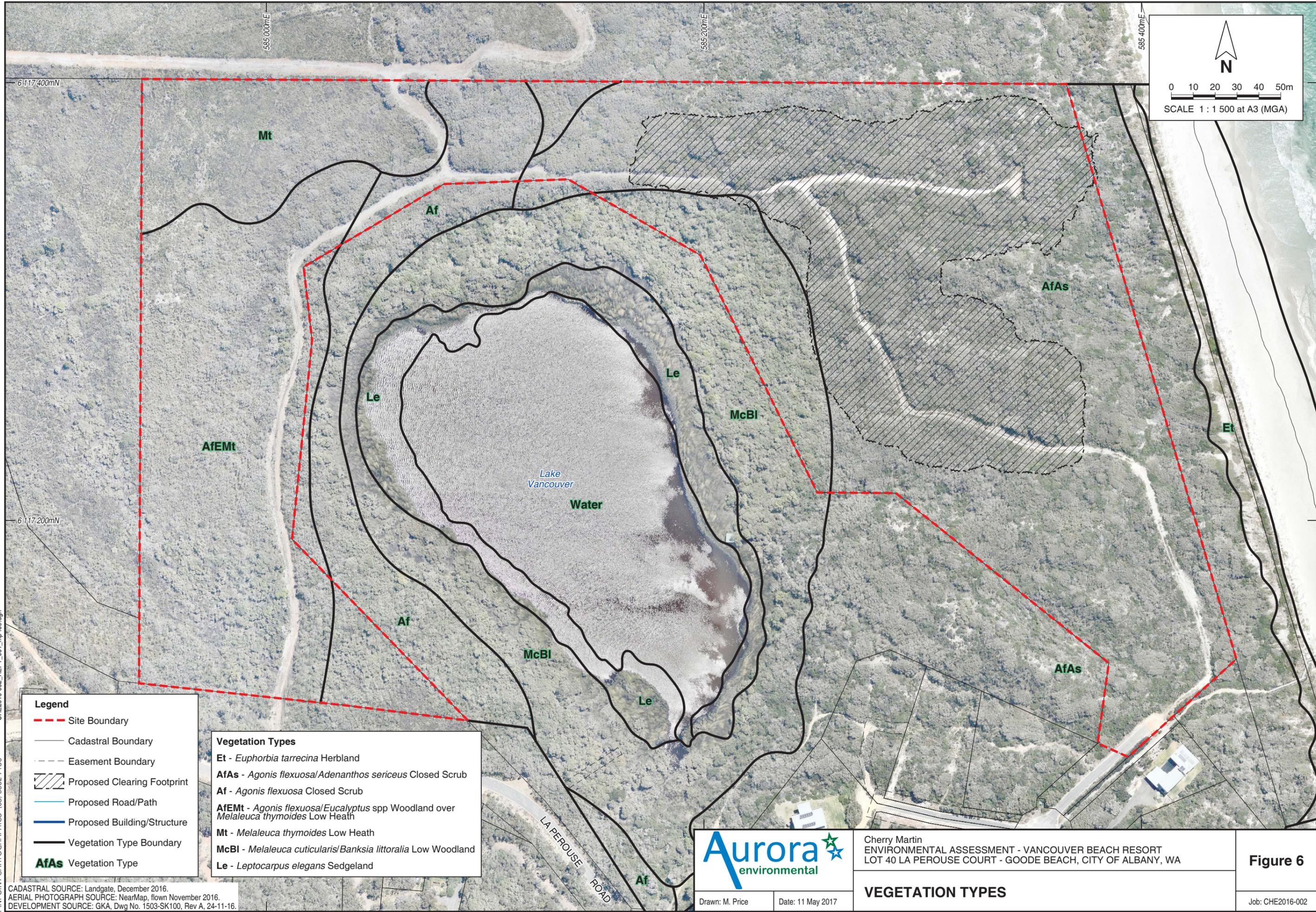
- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
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- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- Other groups and individuals

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

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

APPENDIX 3

Vegetation Mapping



N

0 10 20 30 40 50m

SCALE 1 : 1 500 at A3 (MGA)

Legend

- - - Site Boundary
- Cadastral Boundary
- Easement Boundary
- Proposed Clearing Footprint
- Proposed Road/Path
- Proposed Building/Structure
- Vegetation Type Boundary
- AfAs Vegetation Type

Vegetation Types

- Et** - *Euphorbia tarrecina* Herbland
- AfAs** - *Agonis flexuosa/Adenanthos sericeus* Closed Scrub
- Af** - *Agonis flexuosa* Closed Scrub
- AfEMt** - *Agonis flexuosa/Eucalyptus* spp Woodland over *Melaleuca thymoides* Low Heath
- Mt** - *Melaleuca thymoides* Low Heath
- McBI** - *Melaleuca cuticularis/Banksia littoralis* Low Woodland
- Le** - *Leptocarpus elegans* Sedgeland

PINPOINT CARTOGRAPHICS (08) 9562 7136

CADASTRAL SOURCE: Landgate, December 2016.
 AERIAL PHOTOGRAPH SOURCE: NearMap, flown November 2016.
 DEVELOPMENT SOURCE: GKA, Dwg No. 1503-SK100, Rev A, 24-11-16.

Aurora
 environmental

Drawn: M. Price Date: 11 May 2017

Cherry Martin
 ENVIRONMENTAL ASSESSMENT - VANCOUVER BEACH RESORT
 LOT 40 LA PEROUSE COURT - GOODE BEACH, CITY OF ALBANY, WA

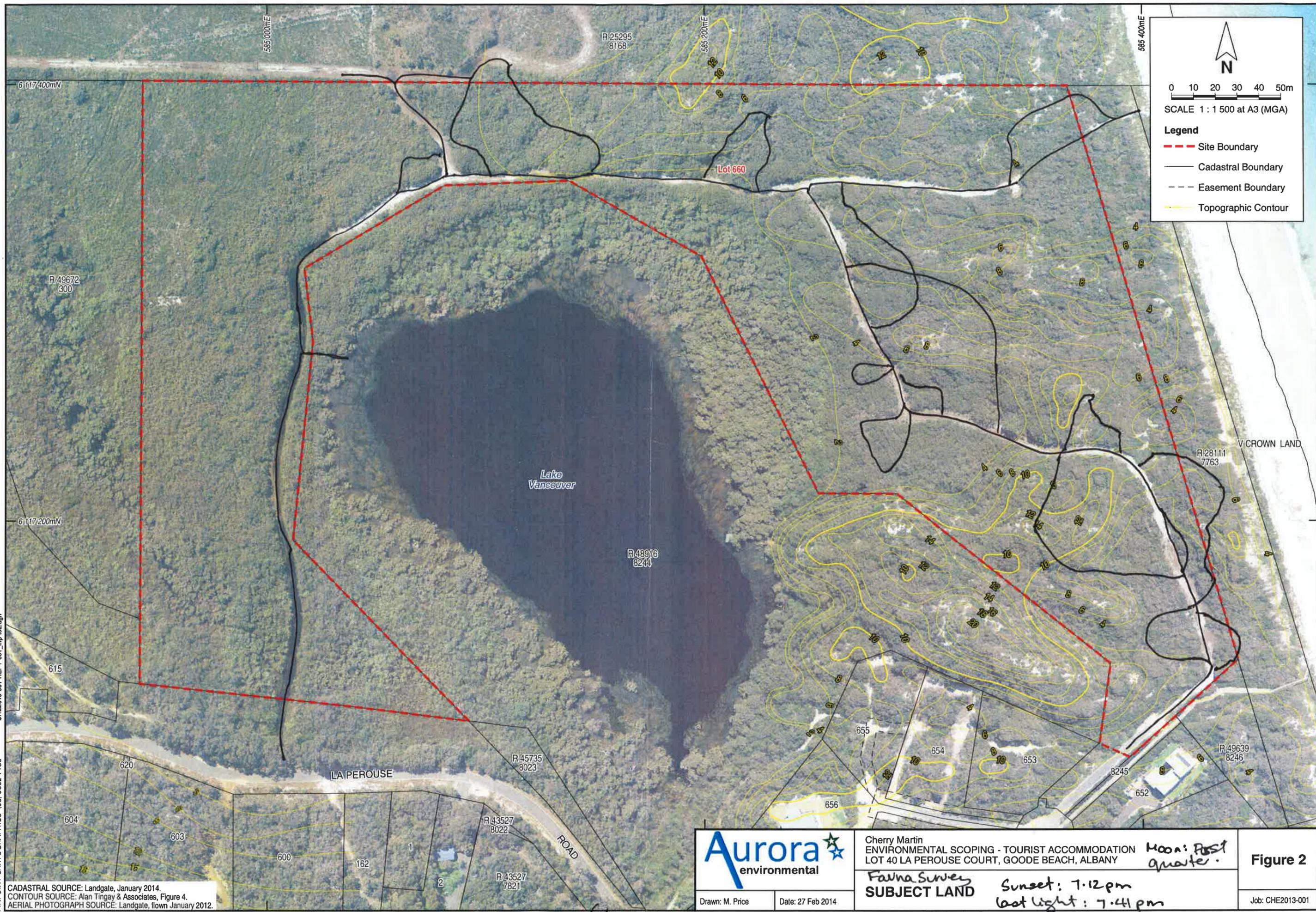
VEGETATION TYPES

Job: CHE2016-002

Figure 6

APPENDIX 4

Day Time Survey Area for WRP



CADASTRAL SOURCE: Landgate, January 2014.
 CONTOUR SOURCE: Alan Tingay & Associates, Figure 4.
 AERIAL PHOTOGRAPH SOURCE: Landgate, flown January 2012.

Aurora environmental
 Drawn: M. Price Date: 27 Feb 2014

Cherry Martin
 ENVIRONMENTAL SCOPING - TOURIST ACCOMMODATION
 LOT 40 LA PEROUSE COURT, GOODE BEACH, ALBANY
 Fauna Survey
SUBJECT LAND
 Moon: First Quarter
 Sunset: 7.12 pm
 Last light: 7.41 pm

Figure 2
 Job: CHE2013-001

6/12/16

conditions clear, light breeze warm.

PINPOINT CARTOGRAPHICS (08) 9562 7136
 CHE2013-001-REPT-001_mp-02.dgn

APPENDIX 5

DPAW Licence Number 08-000333-1



Wildlife Conservation Act 1950

REGULATION 17

Regulation 17 – Licence to take fauna for scientific purposes (Regulation 17 - Standard)

The undermentioned person may take fauna for research or other scientific purposes and where authorised, keep it in captivity, subject to the following and attached conditions, which may be added to, suspended or otherwise varied as considered fit.

Director General

Conditions

- 1 The licensee shall comply with the provisions of the Wildlife Conservation Act 1950, Wildlife Conservation Regulations 1970 and any Notices in force under this legislation.
- 2 The licensee shall take fauna only in the manner stated on the endorsed Regulation 17 licence application form and endorsed related correspondence.
- 3 Unless specifically authorised in the conditions of this Licence or otherwise in writing by the Director General, species of fauna declared as likely to become extinct, rare or otherwise in need of special protection shall not be taken.
- 4 Any by-catch of fauna, which is declared to be rare, likely to become extinct, or otherwise in need of special protection shall be released immediately at the point of capture. Where such fauna taken under this licence is injured or deceased, the licensee shall contact the Department's Wildlife Licensing Section for advice on disposal. Records must be kept of any such fauna so captured and details are to be included in the report required under further condition below.
- 5 Any interaction involving Gazetted Threatened Fauna that may be harmful to the fauna and/or invasive may require approval from the Commonwealth Department of the Environment ph 02 6274 1111. Interaction with such species is controlled by the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 and Environment Protection and Biodiversity Conservation Regulations 2000 as well as the Wildlife Conservation Act 1950 and Wildlife Conservation Regulations 1970.
- 6 No fauna shall be taken in areas where it would impinge on pre-existing scientific research programs.
- 7 Except in the case of approved lethal traps, the licensee shall ensure that measures are taken in the capture and handling of fauna to prevent injury or mortality resulting from that capture or handling. Where traps or other mechanical means or devices are used to capture fauna these shall be deployed so as to prevent exposure of trapped animals to ants and debilitating weather conditions and inspected at regular intervals throughout each day of their use. At the conclusion of research all markers used, and signs and structures erected by the licensee shall be removed and the environment returned to its original condition.
- 8 Not more than ten specimens of any one protected species of fauna shall be taken and removed from any location less than 20km apart. Where exceptional circumstances make it necessary to take a larger number of specimens from a particular location in order to obtain adequate statistical data, the collector must proceed with circumspection and justify their actions to the Director General in advance.
- 9 The licensee shall not release any fauna or their progeny in any area where it does not naturally occur, nor hand such fauna over to any other person or authority unless approved by the Director General, nor dispose of the remains of such fauna in any manner likely to confuse the natural or present day distribution of the species.
- 10 Bioprospecting involving the removal of sample aquatic and terrestrial organisms for chemical extraction and bioactivity screening shall not be conducted without specific written approval by the Director General.
- 11 No fauna shall be taken from any CALM land, as defined in the Conservation and Land Management Regulations 2002, without prior written approval of the Director General. No fauna shall be taken from any public land without the prior written approval of the Government Authority managing that land.
- 12 The licensee shall not enter upon any private property or pastoral lease for the purposes of this licence, nor take any fauna from any private land or pastoral lease without the prior consent in writing of the owner or occupier. Similarly, in the case of Aboriginal lands, the licensee must not enter upon or take fauna from such lands without the written approval of the Department of Aboriginal Affairs and/or the relevant native title holders or applicants.
- 13 Copies of this licence and any written approval or consent required by conditions of this licence must be carried by the licensee and any person/s authorised under the licence at all times when conducting activities relevant to the licence

DEPARTMENT OF PARKS AND WILDLIFE



Department of
Parks and Wildlife



Enquiries: 17 DICK PERRY AVE, KENSINGTON, WESTERN AUSTRALIA
Telephone: 08 9219 9000
Facsimile: 08 9219 8242
Web Site: <https://wildlifelicencing-internal.dpaw.wa.gov.au/>
Correspondance: **Locked Bag 30**
Bentley Delivery Centre WA 6983

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NO. 08-000333-1

and must be presented to an authorised officer of the Department upon request.

- 14 All holotypes and syntypes and a half share of paratypes of species or subspecies permitted to be permanently taken under this licence shall be donated to the Western Australian Museum. Duplicates (one pair in each case) of any species collected, which represents a significant extension of geographic range shall upon request be donated to the Western Australian Museum.
- 15 To prevent any unnecessary collecting in this State, all specimens and material taken and retained under the authority of this license shall, upon request, be loaned to the Western Australian Museum. Any unused portion or portions of any specimen collected under the authority of this license shall be offered to the Western Australian Museum for inclusion in its collection or made available to other scientific workers if so required.
- 16 Within one month of the expiration of this licence, the holder shall submit an electronic return into the department's Wildlife Licensing System, detailing the locality, site, geocode, date and number of each species of fauna captured, sighted or vouchered during the currency of the licence. A copy of any paper, report or thesis resulting from the research shall upon completion be lodged with the Director General.

Purpose

Targeted fauna survey for the threatened Main's assassin spider (*Zephyrarchaea mainae*) using hand collection techniques, sieving of leaf litter, for the Vancouver Beach Resort environmental assessment. Up to one individual of the target species may be retained as a voucher specimen for lodgement with the WA Museum. Additional voucher specimens of the target species and other arachnids found may be retained at the request of the WA Museum.

Locations

Lot 660, La Perouse Court, Goode Beach, Albany

Authorised Person

Surname	Given name(s)

Date of Issue	09/03/2017
Valid From	13/03/2017
Date of Expiry	31/03/2017

Licensee: Ms Melanie Price
Address: Aurora Environmental
2A Nakina Street
Albany WA 6330
Australia

Issued by a Wildlife Licensing Officer of the Department of Parks and Wildlife under delegation from the Minister for Environment pursuant to section 133(1) of the Conservation and Land Management Act 1984.

APPENDIX 6

Vegetation Condition Scale Description

Vegetation Condition Scale (Thackway and Lesslie 2006)

		Native Vegetation Cover			Non-native Vegetation Cover		
Vegetation Cover Class Criteria	Type 0 - Naturally bare Areas where native vegetation does not naturally persist	Type I Residual Native vegetation community structure, composition, and regenerative capacity intact – no significant perturbation from landuse/land management practice	Type II Modified Native vegetation community structure, composition and regenerative capacity intact – perturbed by land use /land management practice	Type III Transformed Native vegetation community structure, composition and regenerative capacity significantly altered by land use/land management practice	Type IV Replaced Adventive Native vegetation replacement – species alien to the locality and spontaneous in occurrence	Type V Replaced Managed Native vegetation replacement with cultivated vegetation	Type VI Removed Vegetation removal
Diagnostic Criteria	Natural regenerative capacity unmodified	unmodified, structural and compositional integrity of native vegetation is very high	Natural regeneration tolerates/endures under past &/or present current land management practices. Structure is predominantly altered but intact e.g. a layer and/growth form and or age classes removed. Composition of vegetation is altered but intact	Natural regenerative capacity is limited/at risk under past &/or current land use or land management practices. Rehabilitation and restoration possible through modified land management practice Dominant structuring species of native vegetation community significantly altered e.g. a layer frequently and repeatedly removed	Regeneration of native vegetation community has been suppressed by ongoing disturbances of the natural regenerative capacity Limited potential for restoration. Dominant structuring species of native vegetation removed or predominantly cleared or extremely degraded.	Regeneration of native vegetation community lost or suppressed by intensive land management. Limited potential for restoration. Dominant structuring species of native vegetation community removed.	Nil or minimal. Vegetation absent or ornamental
Corresponding Keighery (1994) Condition Scale		Very good excellent, pristine	Good to very good	Very degraded to degraded/good	Completely degraded	Completely degraded	

Thackway, R. and Lesslie, R. (2006) Reporting Vegetation Condition Using the Vegetation Assets, States and Transitions (VAST) Framework. Ecological Management and Restoration. 7, Suppl. 1. S53-S62
 Keighery (1994) Keighery, B.J. (1994) Bushland plant survey. A guide to plant community survey for the community. Wildflower Society of WA (Inc.), Nedlands, Western Australia.

APPENDIX 2

Camera Locations

Appendix 2: Camera Locations

Camera 1 – tree-mounted

35.083802 S

117.935709 E

Camera 2 – tree-mounted

35.083609 S

117.935613 E

Camera 3 – ground

35.083339 S

117.935369 E

Camera 4 – tree-mounted

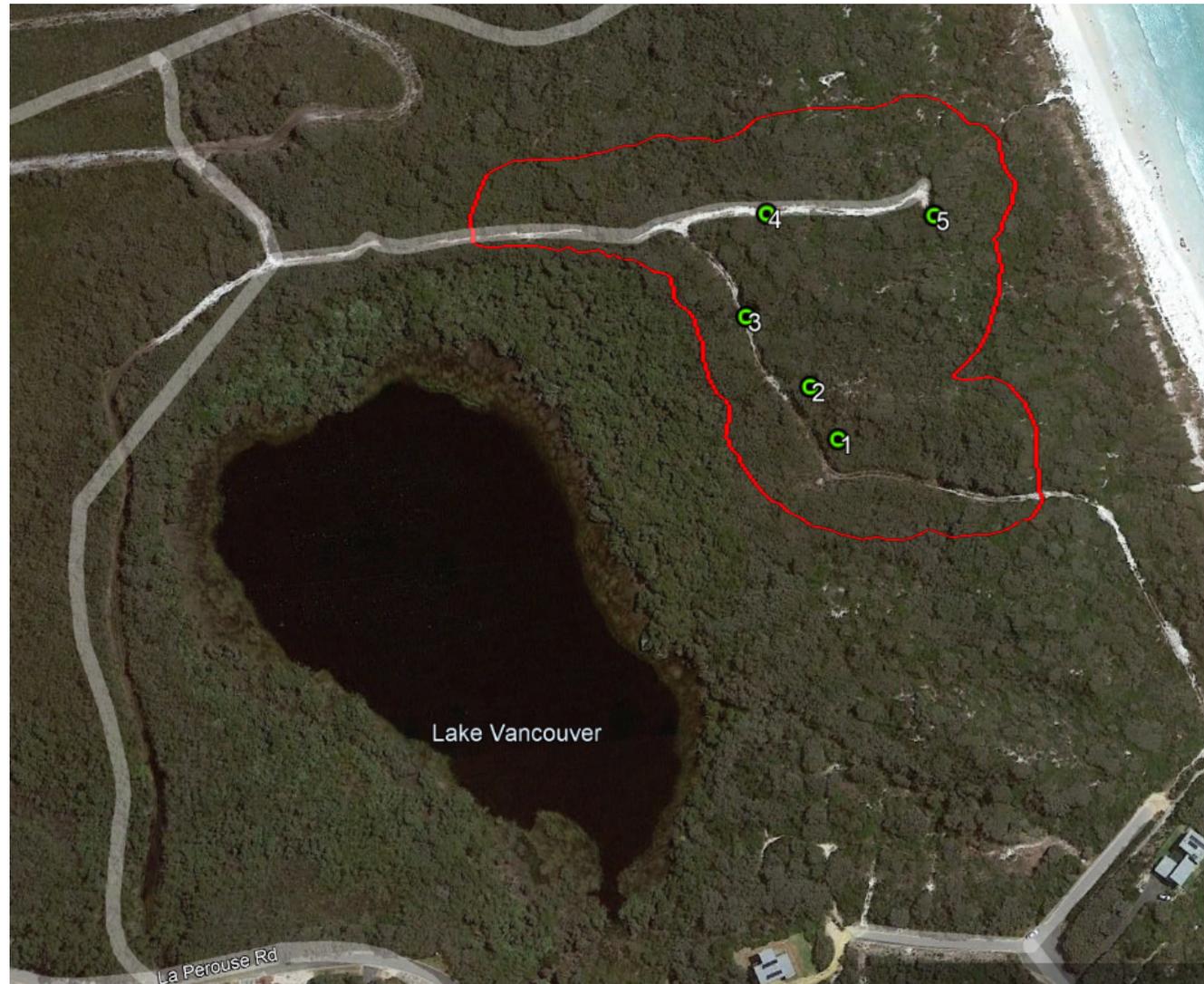
35.082986 S

117.935506 E

Camera 5 – ground

35.083056 S

117.936227 E



APPENDIX 3

Naturemap Search Results

Appendix 3 – Naturemap Database Search Results

SPECIES	COUNT
AMPHIBIANS	270
<i>Crinia georgiana</i>	25
<i>Crinia glauerti</i>	7
<i>Crinia glauertii</i>	1
<i>Crinia sp.</i>	1
<i>Crinia sp_2</i>	1
<i>Geocrinia leai</i>	34
<i>Heleioporus eyrei</i>	48
<i>Heleioporus sp.</i>	2
<i>Limnodynastes dorsalis</i>	47
<i>Litoria adelaidensis</i>	27
<i>Litoria cyclorhyncha</i>	2
<i>Litoria moorei</i>	51
<i>Metacrinia nichollsi</i>	20
<i>Myobatrachus gouldii</i>	1
<i>Pseudophryne guentheri</i>	3
BIRDS	30327
<i>Acanthiza apicalis</i>	282
<i>Acanthiza chrysorrhoa</i>	258
<i>Acanthiza inornata</i>	6
<i>Acanthorhynchus superciliosus</i>	431
<i>Accipiter cirrocephalus</i>	124
<i>Accipiter fasciatus</i>	18
<i>Acrocephalus australis</i>	156
<i>Actitis hypoleucos</i>	48
<i>Aegotheles cristatus</i>	4
<i>Aegotheles cristatus subsp. cristatus</i>	1
<i>Anas castanea</i>	19
<i>Anas gracilis</i>	118
<i>Anas platyrhynchos</i>	16
<i>Anas rhynchotis</i>	30
<i>Anas superciliosa</i>	363
<i>Anhinga novaehollandiae</i>	12
<i>Anthochaera carunculata</i>	853
<i>Anthochaera lunulata</i>	83
<i>Anthus cervinus</i>	1
<i>Apus pacificus</i>	2

SPECIES	COUNT
BIRDS CONT.	
<i>Aquila audax</i>	17
<i>Ardea ibis</i>	8
<i>Ardea modesta</i>	226
<i>Ardea pacifica</i>	6
<i>Ardenna carneipes</i>	25
<i>Ardenna grisea</i>	1
<i>Ardenna tenuirostris</i>	3
<i>Arenaria interpres</i>	112
<i>Artamus cyanopterus</i>	29
<i>Atrichornis clamosus</i>	4
<i>Aythya australis</i>	52
<i>Barnardius zonarius</i>	147
<i>Biziura lobata</i>	213
<i>Cacatua sanguinea</i>	67
<i>Cacomantis flabelliformis</i>	294
<i>Cacomantis flabelliformis subsp. flabelliformis</i>	1
<i>Calidris acuminata</i>	42
<i>Calidris alba (Crocethia alba)</i>	5
<i>Calidris canutus</i>	65
<i>Calidris ferruginea</i>	10
<i>Calidris ruficollis</i>	202
<i>Calidris sp.</i>	1
<i>Calidris tenuirostris</i>	149
<i>Calyptorhynchus banksii</i>	9
<i>Calyptorhynchus banksii subsp. naso</i>	4
<i>Calyptorhynchus baudinii</i>	102
<i>Calyptorhynchus latirostris</i>	302
<i>Calyptorhynchus sp.</i>	72
<i>Cereopsis novaehollandiae</i>	2
<i>Charadrius leschenaultii</i>	156
<i>Charadrius mongolus</i>	11
<i>Charadrius ruficapillus</i>	145
<i>Chenonetta jubata</i>	166
<i>Chroicocephalus novaehollandiae</i>	747
<i>Chrysococcyx basalis</i>	1
<i>Chrysococcyx lucidus subsp. plagosus</i>	1

Appendix 3 – Naturemap Database Search Results

SPECIES	COUNT
BIRDS CONT.	
<i>Circus approximans</i>	143
<i>Cladorhynchus leucocephalus</i>	6
<i>Colluricincla harmonica</i>	208
<i>Columba livia</i>	38
<i>Coracina novaehollandiae</i>	243
<i>Corvus coronoides</i>	907
<i>Coturnix ypsilophora</i>	23
<i>Coturnix ypsilophora subsp. australis</i>	1
<i>Cracticus tibicen</i>	788
<i>Cracticus torquatus</i>	141
<i>Cygnus atratus</i>	371
<i>Dacelo novaeguineae</i>	437
<i>Daphoenositta chrysoptera</i>	24
<i>Diomedea chlororhynchos</i>	1
<i>Egretta garzetta</i>	3
<i>Egretta novaehollandiae</i>	364
<i>Egretta sacra</i>	2
<i>Elanus axillaris</i>	57
<i>Elseornis melanops</i>	32
<i>Eolophus roseicapillus</i>	372
<i>Eopsaltria georgiana</i>	454
<i>Eopsaltria griseogularis</i>	2
<i>Epthianura albifrons</i>	8
<i>Eudyptes pachyrhynchus</i>	1
<i>Eudyptula minor</i>	4
<i>Eudyptula minor subsp. novaehollandiae</i>	7
<i>Falco berigora</i>	33
<i>Falco cenchroides</i>	100
<i>Falco longipennis</i>	5
<i>Falco peregrinus</i>	9
<i>Falcunculus frontatus</i>	9
<i>Fulica atra</i>	217
<i>Gallinula tenebrosa</i>	66
<i>Gallinula tenebrosa subsp. tenebrosa</i>	1
<i>Gallirallus philippensis</i>	128
<i>Gallirallus philippensis subsp. mellori</i>	1

SPECIES	COUNT
BIRDS CONT.	
<i>Gerygone fusca</i>	312
<i>Glossopsitta porphyrocephala</i>	162
<i>Glyciphila melanops</i>	41
<i>Grallina cyanoleuca</i>	626
<i>Haematopus fuliginosus</i>	121
<i>Haematopus fuliginosus subsp. fuliginosus</i>	1
<i>Haematopus longirostris</i>	265
<i>Haliaeetus leucogaster</i>	75
<i>Haliastur sphenurus</i>	21
<i>Hieraaetus morphnoides</i>	48
<i>Himantopus himantopus</i>	4
<i>Hirundo neoxena</i>	778
<i>Hydroprogne caspia</i>	241
<i>Larus dominicanus</i>	1
<i>Larus novaehollandiae</i>	5
<i>Larus novaehollandiae subsp. novaehollandiae</i>	2
<i>Larus pacificus</i>	318
<i>Leipoa ocellata</i>	1
<i>Lichenostomus virescens</i>	7
<i>Lichmera indistincta</i>	265
<i>Limosa lapponica</i>	172
<i>Limosa limosa</i>	5
<i>Lophoictinia isura</i>	8
<i>Macronectes giganteus</i>	2
<i>Malacorhynchus membranaceus</i>	1
<i>Malurus elegans</i>	736
<i>Malurus pulcherrimus</i>	1
<i>Malurus splendens</i>	369
<i>Manorina flavigula</i>	2
<i>Megalurus grammurus</i>	149
<i>Melithreptus brevirostris</i>	1
<i>Melithreptus lunatus</i>	197
<i>Microcarbo melanoleucos</i>	267
<i>Microeca fascinans</i>	3
<i>Morus serrator</i>	54
<i>Myiagra inquieta</i>	9

Appendix 3 – Naturemap Database Search Results

SPECIES	COUNT
BIRDS CONT.	
<i>Neophema elegans</i>	58
<i>Neophema petrophila</i>	37
<i>Ninox novaeseelandiae</i>	124
<i>Numenius madagascariensis</i>	3
<i>Numenius phaeopus</i>	12
<i>Nycticorax caledonicus</i>	1
<i>Oceanites oceanicus</i>	2
<i>Oceanites tropicus</i>	1
<i>Ocyphaps lophotes</i>	231
<i>Oxyura australis</i>	158
<i>Pachycephala pectoralis</i>	652
<i>Pachycephala rufiventris</i>	11
<i>Pachyptila desolata</i>	2
<i>Pandion haliaetus</i>	71
<i>Pardalotus punctatus</i>	217
<i>Pardalotus striatus</i>	37
<i>Pavo christatus</i>	1
<i>Pavo cristatus</i>	3
<i>Pelecanoides urinatrix subsp. exsul</i>	1
<i>Pelecanus conspicillatus</i>	510
<i>Petrochelidon ariel</i>	7
<i>Petrochelidon nigricans</i>	383
<i>Petroica boodang</i>	3
<i>Pezoporus flaviventris</i>	2
<i>Pezoporus wallicus subsp. flaviventris</i>	1
<i>Phaethon rubricauda</i>	1
<i>Phalacrocorax carbo</i>	346
<i>Phalacrocorax fuscescens</i>	2
<i>Phalacrocorax sulcirostris</i>	344
<i>Phalacrocorax varius</i>	56
<i>Phaps chalcoptera</i>	830
<i>Phaps elegans</i>	50
<i>Phylidonyris niger</i>	31
<i>Phylidonyris novaehollandiae</i>	1120
<i>Platalea flavipes</i>	160
<i>Platycercus icterotis</i>	725

SPECIES	COUNT
BIRDS CONT.	
<i>Platycercus spurius</i>	1
<i>Pluvialis fulva</i>	117
<i>Pluvialis squatarola</i>	225
<i>Podargus strigoides</i>	47
<i>Podiceps cristatus</i>	22
<i>Poliocephalus poliocephalus</i>	160
<i>Polytelis anthopeplus</i>	2
<i>Pomatostomus superciliosus</i>	1
<i>Porphyrio porphyrio</i>	169
<i>Porzana fluminea</i>	3
<i>Porzana pusilla</i>	3
<i>Porzana tabuensis</i>	80
<i>Psophodes nigrogularis subsp. nigrogularis</i>	1
<i>Pterodroma macroptera</i>	4
<i>Pterodroma mollis</i>	1
<i>Ptilotula ornatus</i>	1
<i>Puffinus assimilis</i>	3
<i>Puffinus assimilis subsp. assimilis</i>	1
<i>Puffinus carneipes</i>	2
<i>Puffinus huttoni</i>	3
<i>Purpureicephalus spurius</i>	600
<i>Recurvirostra novaehollandiae</i>	7
<i>Rhipidura albiscapa</i>	735
<i>Rhipidura fuliginosa subsp. preissi</i>	1
<i>Rhipidura leucophrys</i>	573
<i>Sericornis frontalis</i>	738
<i>Smicrornis brevirostris</i>	1
<i>Stagonopleura oculata</i>	537
<i>Stercorarius antarcticus</i>	10
<i>Stercorarius parasiticus</i>	3
<i>Sternula nereis</i>	144
<i>Stictonetta naevosa</i>	2
<i>Stipiturus malachurus</i>	180
<i>Strepera versicolor</i>	254
<i>Streptopelia senegalensis</i>	414
<i>Sula serrator</i>	1

Appendix 3 – Naturemap Database Search Results

SPECIES	COUNT
BIRDS CONT.	
<i>Tachybaptus novaehollandiae</i>	87
<i>Tadorna tadornoides</i>	87
<i>Thalassarche carteri</i>	1
<i>Thalassarche cauta</i>	2
<i>Thalassarche chlororhynchos</i>	13
<i>Thalassarche melanophris</i>	6
<i>Thalasseus bergii</i>	333
<i>Thinornis rubricollis</i>	18
<i>Threskiornis molucca</i>	357
<i>Threskiornis spinicollis</i>	97
<i>Todiramphus sanctus</i>	132
<i>Tribonyx ventralis</i>	5
<i>Tringa brevipes</i>	81
<i>Tringa nebularia</i>	174
<i>Tringa stagnatilis</i>	11
<i>Turnix varia</i>	1
<i>Turnix varius</i>	4
<i>Tyto alba</i>	1
<i>Vanellus miles</i>	51
<i>Vanellus tricolor</i>	15
<i>Xenus cinereus</i>	5
<i>Zosterops lateralis</i>	908
<i>Zosterops lateralis subsp. gouldi</i>	1
INVERTEBRATES	435
<i>Aganippe raphiduca</i>	5
<i>Akamptogonus novarae</i>	7
<i>Ambicodamus marae</i>	1
<i>Amblyomma fimbriatum</i>	13
<i>Aname mainae</i>	1
<i>Aname tepperi</i>	82
<i>Arachnura higginsii</i>	7
<i>Araneae sp.</i>	1
<i>Araneus cyphoxis</i>	3
<i>Araneus senicaudatus</i>	1
<i>Araneus sydneyicus</i>	1
<i>Argiope trifasciata</i>	1

SPECIES	COUNT
INVERTEBRATES CONT.	
<i>Arkys walckenaeri</i>	3
<i>Artoria cingulipes</i>	5
<i>Artoria flavimana</i>	8
<i>Artoriopsis eccentrica</i>	14
<i>Atelomastix mainae</i>	49
<i>Austracantha minax</i>	1
<i>Australobus torbay</i>	47
<i>Australomimetus aurioculatus</i>	1
<i>Australomimetus diabolicus</i>	4
<i>Australoschendyla albanyensis</i>	2
<i>Austrarchaea mainae</i>	5
<i>Backbourkia brounii</i>	1
<i>Baiami torbayensis</i>	4
<i>beetle sp.</i>	1
<i>Bothriembryon kingii</i>	1
<i>Bothriembryon melo</i>	1
<i>Cercophonius sulcatus</i>	4
<i>Chasmocephalon flinders</i>	2
<i>Cherax destructor</i>	1
<i>Cormocephalus hartmeyerii</i>	4
<i>Cormocephalus michaelsoni</i>	7
<i>Cyclosa fuliginata</i>	1
<i>Cyclosa trilobata</i>	1
<i>Demadiana cerula</i>	7
<i>Dingosa serrata</i>	1
<i>Eodelena lapidicola</i>	2
<i>Eriophora biapicata</i>	5
<i>Helicarion castanea</i>	1
<i>Henicops dentatus</i>	2
<i>Holasteron aspinosum</i>	1
<i>Holasteron reinholdae</i>	14
<i>Hylaeus globuliferus</i>	1
<i>Hypomegalopsalis tanisphyros</i>	3
<i>Isopeda leishmanni</i>	4
<i>Lampona cylindrata</i>	8
<i>Lampona foliifera</i>	1

Appendix 3 – Naturemap Database Search Results

SPECIES	COUNT
INVERTEBRATES CONT.	
<i>Latrodectus hasseltii</i>	4
<i>Lycosa godeffroyi</i>	1
<i>Maratus linnaei</i>	3
<i>Maratus pavonis</i>	3
<i>Menneus wa</i>	2
<i>Micropholcomma linnaei</i>	1
<i>Missulena granulosa</i>	5
<i>Missulena hoggi</i>	9
<i>Mituliodon tarantulinus</i>	5
<i>Molycrria quadricauda</i>	2
<i>Myandra bicincta</i>	1
<i>Nanometa gentilis</i>	2
<i>Nomindra leeuweni</i>	1
<i>Ommatoiulus moreletii</i>	1
<i>Oxidus gracilis</i>	1
<i>Ozarchaea westraliensis</i>	1
<i>Parapallene famelica</i>	1
<i>Parapallene haddoni</i>	1
<i>Pinkfloydia harveii</i>	1
<i>Poltys laciniosus</i>	1
<i>Prionosternum scutatatum</i>	8
<i>Protogarypinus giganteus</i>	4
<i>Pycnothea flynni</i>	8
<i>Raveniella janineae</i>	1
<i>Raveniella mucronata</i>	1
<i>Raveniella peckorum</i>	4
<i>Samichus decoratus</i>	5
<i>Spinicrus porongorupensis</i>	1
<i>Synsphyronus callus</i>	3
<i>Taphiassa robertsi</i>	2
<i>Tasmanoonops mainae</i>	1
<i>Tetrallycosa oraria</i>	1
<i>Trioza barrettae</i>	1
<i>Urodacus novaehollandiae</i>	1
<i>Westralunio carteri</i>	2
<i>Zephyrarchaea mainae</i>	6

SPECIES	COUNT
MAMMALS	1059
<i>Antechinus flavipes subsp. leucogaster</i>	4
<i>Arctocephalus forsteri</i>	1
<i>Arctocephalus tropicalis</i>	1
<i>Balaenoptera musculus</i>	1
<i>Balaenoptera musculus subsp. brevicauda</i>	1
<i>Canis lupus subsp. familiaris</i>	1
<i>Capra hircus</i>	1
<i>Cercartetus concinnus</i>	3
<i>Chalinolobus gouldii</i>	1
<i>Chalinolobus morio</i>	3
<i>Dasyurus geoffroyi</i>	1
<i>Delphinus delphis</i>	8
<i>Eubalaena australis</i>	2
<i>Felis catus</i>	15
<i>Hydromys chrysogaster</i>	4
<i>Hydrurga leptonyx</i>	1
<i>Isoodon fusciventer</i>	23
<i>Isoodon obesulus</i>	52
<i>Isoodon obesulus fusciventer</i>	166
<i>Isoodon obesulus subsp. fusciventer</i>	17
<i>Macropus fuliginosus</i>	1
<i>Macropus irma</i>	1
<i>Macrotis lagotis</i>	1
<i>Megaptera novaeangliae</i>	1
<i>Mesoplodon grayi</i>	1
<i>Mormopterus loriae</i>	1
<i>Mus musculus</i>	32
<i>Neophoca cinerea</i>	3
<i>Nyctophilus geoffroyi</i>	1
<i>Nyctophilus timoriensis subsp. timoriensis</i>	1
<i>Orcinus orca</i>	1
<i>Oryctolagus cuniculus</i>	2
<i>Parantechinus apicalis</i>	6
<i>Phascogale tapoatafa subsp. tapoatafa</i>	2
<i>Phascogale tapoatafa subsp. wambenger</i>	1
<i>Physeter macrocephalus</i>	2

Appendix 3 – Naturemap Database Search Results

SPECIES	COUNT
MAMMALS CONT.	
<i>Potorous gilbertii</i>	1
<i>Pseudocheirus occidentalis</i>	411
<i>Pseudorca crassidens</i>	1
<i>Rattus fuscipes</i>	78
<i>Rattus norvegicus</i>	2
<i>Rattus rattus</i>	89
<i>Rattus sp.</i>	4
<i>Setonix brachyurus</i>	4
<i>Sminthopsis dolichura</i>	1
<i>Sminthopsis griseoventer</i>	6
<i>Sminthopsis griseoventer subsp. griseoventer</i>	25
<i>Sminthopsis griseoventor</i>	1
<i>Sminthopsis murina</i>	7
<i>Sminthopsis sp.</i>	1
<i>Stenella coeruleoalba</i>	1
<i>Tadarida australis</i>	1
<i>Tarsipes rostratus</i>	47
<i>Trichosurus vulpecula hypoleucus</i>	9
<i>Trichosurus vulpecula subsp. vulpecula</i>	1
<i>Tursiops aduncus</i>	2
<i>Vespadelus regulus</i>	3
<i>Vulpes vulpes</i>	1
REPTILES	334
<i>Acritoscincus trilineatum</i>	3
<i>Acritoscincus trilineatus</i>	7
<i>Antaresia stimsoni subsp. stimsoni</i>	1
<i>Aprasia repens</i>	3
<i>Aprasia striolata</i>	29
<i>Caretta caretta</i>	5
<i>Chelodina colliei</i>	3
<i>Christinus marmoratus</i>	27
<i>Ctenotus catenifer</i>	19
<i>Ctenotus gemmula</i>	2
<i>Ctenotus labillardieri</i>	1
<i>Ctenotus labillardieri</i>	9
<i>Delma australis</i>	1

SPECIES	COUNT
REPTILES CONT.	
<i>Dermochelys coriacea</i>	1
<i>Echiopsis curta</i>	17
<i>Egernia kingii</i>	45
<i>Egernia napoleonis</i>	6
<i>Elapognathus coronatus</i>	28
<i>Elapognathus minor</i>	5
<i>Hemiergis gracilipes</i>	10
<i>Hemiergis peronii peronii</i>	2
<i>Hemiergis peronii subsp. peronii</i>	18
<i>Hydrophis platurus</i>	7
<i>Lerista distinguenda</i>	1
<i>Lerista microtis subsp. microtis</i>	25
<i>Lialis burtonis</i>	1
<i>Liopholis pulchra subsp. pulchra</i>	1
<i>Lissolepis luctuosa</i>	5
<i>Menetia greyii</i>	1
<i>Morelia spilota subsp. imbricata</i>	9
<i>Notechis scutatus</i>	9
<i>Pseudonaja affinis subsp. affinis</i>	7
<i>Pygopus lepidopodus</i>	4
<i>Rhinoplocephalus bicolor</i>	3
<i>Tiliqua rugosa</i>	1
<i>Tiliqua rugosa rugosa</i>	1
<i>Tiliqua rugosa subsp. rugosa</i>	1
<i>Underwoodisaurus milii</i>	10
<i>Varanus rosenbergi</i>	6

APPENDIX 4

Protected Matters Search Results



Australian Government

Department of Climate Change, Energy,
the Environment and Water

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. Please see the caveat for interpretation of information provided here.

Report created: 24-Mar-2023

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment 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 (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	59
Listed Migratory Species:	64

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 <https://www.dcceew.gov.au/parks-heritage/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 Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	91
Whales and Other Cetaceans:	14
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	4
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	12
Key Ecological Features (Marine):	None
Biologically Important Areas:	12
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

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

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area	In buffer area only
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cereopsis novaehollandiae grisea Cape Barren Goose (south-western), Recherche Cape Barren Goose [25978]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dasyornis longirostris Western Bristlebird [515]	Endangered	Species or species habitat likely to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Zanda baudinii listed as Calyptorhynchus baudinii Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Breeding known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Zanda latirostris listed as Calyptorhynchus latirostris			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area	In feature area
FISH			
Thunnus maccoyii			
Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
INSECT			
Trioza barrettae			
Banksia brownii plant louse [87805]	Endangered	Species or species habitat known to occur within area	In feature area
MAMMAL			
Balaenoptera borealis			
Sei Whale [34]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Balaenoptera physalus			
Fin Whale [37]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dasyurus geoffroii			
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eubalaena australis			
Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
Neophoca cinerea			
Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat likely to occur within area	In feature area
Parantechinus apicalis			
Dibbler [313]	Endangered	Species or species habitat known to occur within area	In feature area
Pseudocheirus occidentalis			
Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

PLANT

Scientific Name	Threatened Category	Presence Text	Buffer Status
Banksia brownii Brown's Banksia, Feather-leaved Banksia [8277]	Endangered	Species or species habitat known to occur within area	In feature area
Banksia verticillata Granite Banksia, Albany Banksia, River Banksia [8333]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Caladenia granitora [65292]	Endangered	Species or species habitat may occur within area	In feature area
Caladenia harringtoniae Harrington's Spider-orchid, Pink Spider-orchid [56786]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Calectasia cyanea Blue Tinsel Lily [7669]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Chordifex abortivus Manypeaks Rush [64868]	Endangered	Species or species habitat may occur within area	In buffer area only
Diuris drummondii Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat known to occur within area	In feature area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Isopogon uncinatus Albany Cone Bush, Hook-leaf Isopogon [20871]	Endangered	Species or species habitat known to occur within area	In feature area
Kennedia glabrata Northcliffe Kennedia [16452]	Vulnerable	Species or species habitat may occur within area	In feature area
Sphenotoma drummondii Mountain Paper-heath [21160]	Endangered	Species or species habitat may occur within area	In feature area

REPTILE

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area

SHARK

Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Breeding known to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Onychoprion anaethetus Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In feature area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In feature area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Terrestrial Species			
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area	In buffer area only
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area	In buffer area only
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In buffer area only
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Breeding known to occur within area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat may occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris alba Sanderling [875]		Roosting known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area overfly marine area	In buffer area only
Cereopsis novaehollandiae grisea Cape Barren Goose (south-western), Recherche Cape Barren Goose [25978]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In buffer area only
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area	In buffer area only
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In buffer area only
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area	In feature area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area overfly marine area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only
Onychoprion anaethetus as Sterna anaethetus Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area overfly marine area	In buffer area only
Pterodroma macroptera Great-winged Petrel [1035]		Breeding known to occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Puffinus assimilis Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area	In buffer area only
Stercorarius skua as Catharacta skua Great Skua [823]		Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area overfly marine area	In buffer area only
Fish			
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In feature area
Campichthys galei Gale's Pipefish [66191]		Species or species habitat may occur within area	In feature area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In feature area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In feature area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area	In feature area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area	In feature area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In feature area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In feature area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area	In feature area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area	In feature area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In feature area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In feature area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In feature area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In feature area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In feature area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In feature area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area	In feature area
Mammal			
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat likely to occur within area	In feature area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat likely to occur within area	In feature area
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In feature area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In feature area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Mistaken Island	Nature Reserve	WA	In buffer area only
Seal Island (WA32199)	Nature Reserve	WA	In buffer area only
Torndirrup	National Park	WA	In buffer area only
Unnamed WA32478	5(1)(h) Reserve	WA	In buffer area only

EPBC Act Referrals					[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status	
Controlled action					
Albany Heritage Park Trail Network Concept Plan	2017/7943	Controlled Action	Completed	In buffer area only	
Albany Port Authority dredging project	2006/2540	Controlled Action	Post-Approval	In buffer area only	
Southdown Magnetite Mine	2006/2544	Controlled Action	Completed	In buffer area only	
Not controlled action					
Albany Port Maintenance Dredging, Albany, WA	2014/7246	Not Controlled Action	Completed	In buffer area only	
Anzac Centre Development, Albany, WA	2012/6571	Not Controlled Action	Completed	In buffer area only	
Anzac Interpretive Centre Development, Albany, WA	2013/6903	Not Controlled Action	Completed	In buffer area only	
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area	
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area	
Scuttling of the HMAS Perth	2001/171	Not Controlled Action	Completed	In buffer area only	
Seismic Survey, Bremer Basin, Mentelle Basin and Zeewyck Sub-basin	2004/1700	Not Controlled Action	Completed	In feature area	
Not controlled action (particular manner)					
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area	
Referral decision					

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Referral decision				
Albany Port Maintenance Dredging	2010/5527	Referral Decision	Completed	In buffer area only

Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardena carneipes Flesh-footed Shearwater [82404]	Foraging (in high numbers)	Known to occur	In buffer area only
Eudyptula minor Little Penguin [1085]	Foraging (provisioning young)	Known to occur	In feature area
Hydroprogne caspia Caspian Tern [808]	Foraging (provisioning young)	Known to occur	In feature area
Larus pacificus Pacific Gull [811]	Foraging (in high numbers)	Known to occur	In buffer area only
Onychoprion anaethetus Bridled Tern [82845]	Foraging (in high numbers)	Known to occur	In buffer area only
Puffinus assimilis tunneyi Little Shearwater [59363]	Foraging (in high numbers)	Known to occur	In buffer area only
Sternula nereis Fairy Tern [82949]	Foraging (in high numbers)	Known to occur	In buffer area only
Sharks			
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur	In feature area
Whales			
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur	In feature area
Eubalaena australis Southern Right Whale [40]	Calving buffer	Known to occur	In buffer area only

Scientific Name	Behaviour	Presence	Buffer Status
Eubalaena australis Southern Right Whale [40]	Seasonal calving habitat	Known to occur	In feature area
Megaptera novaeangliae Humpback Whale [38]	Migration (north)	Known to occur	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and 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

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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

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

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

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

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APPENDIX 5

DBCA Threatened Species Database Summary

Appendix 5 – Conservation Significant Fauna – DBCA Database

SPECIES	COMMON NAME	COUNT	WA STATUS	EPBC STATUS	FIRST RECORD	MOST RECENT RECORD
BIRDS						
<i>Actitis hypoleucos</i>	Common Sandpiper	44	Migratory	Migratory	1977	2015
<i>Apus pacificus</i>	Fork-tailed Swift, Pacific Swift	2	Migratory	Migratory	2001	
<i>Ardenna carneipes</i>	Flesh-footed Shearwater	27	Vulnerable	Migratory	1977	2018
<i>Ardenna grisea</i>	Sooty shearwater	1	Migratory	Migratory	2018	
<i>Ardenna tenuirostris</i>	Short-tailed shearwater	2	Migratory	Migratory	2000	2002
<i>Arenaria interpres</i>	Ruddy turnstone	142	Vulnerable	Migratory	1977	2015
<i>Atrichornis clamosus</i>	Noisy Scrub-bird, Tjimiluk	4	Endangered	Endangered	1994	2002
<i>Botaurus poiciloptilus</i>	Australasian Bittern	2	Endangered	Endangered	1977	1981
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	42	Migratory	Migratory	1999	2016
<i>Calidris alba</i>	Sanderling	5	Migratory	Migratory	2000	2015
<i>Calidris canutus</i>	Red Knot	62	Endangered	Endangered	1978	2015
<i>Calidris ferruginea</i>	Curlew Sandpiper	11	Critically Endangered	Migratory	1977	2015
<i>Calidris ruficollis</i>	Red-necked stint	200	Migratory	Migratory	1977	2018
<i>Calidris tenuirostris</i>	Great Knot	145	Critically Endangered	Migratory	1978	2018
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black Cockatoo	3	Vulnerable	Vulnerable	2008	2012
<i>Cereopsis novaehollandiae grisea</i>	Cape Barren Goose, Recherche Cape Barren goose	2	Vulnerable	Vulnerable	2000	
<i>Charadrius leschenaultii</i>	Greater Sand Plover, Large Sand Plover	154	Vulnerable	Migratory	1978	2018
<i>Charadrius mongolus</i>	Lesser Sand Plover	11	Endangered	Migratory	2000	2015

Appendix 5 – Conservation Significant Fauna – DBCA Database

SPECIES	COMMON NAME	COUNT	WA STATUS	EPBC STATUS	FIRST RECORD	MOST RECENT RECORD
<i>Falco peregrinus</i>	Peregrine falcon	13	Other specially protected		1977	2015
<i>Hydroprogne caspia</i>	Caspian Tern	241	Migratory	Migratory	1977	2018
<i>Leipoa ocellata</i>	Malleefowl	1	Vulnerable	Vulnerable	2000	
<i>Limosa lapponica</i>	Bar-tailed Godwit	164	Migratory	Migratory	1978	2018
<i>Limosa limosa</i>	Black-tailed Godwit	6	Migratory	Migratory	1980	2014
<i>Macronectes giganteus</i>	Southern Giant Petrel	5	Migratory	Endangered	1977	
<i>Numenius madagascariensis</i>	Eastern Curlew	3	Critically Endangered	Critically Endangered	2009	2012
<i>Numenius phaeopus</i>	Whimbrel	12	Migratory	Migratory	1999	2014
<i>Oceanites oceanicus</i>	Wilson's Storm-petrel	2	Migratory	Migratory	2015	
<i>Oxyura australis</i>	Blue-billed Duck	173	Priority 4	-	1977	2018
<i>Pandion haliaetus</i>	Osprey	71	Migratory	Migratory	1977	2016
<i>Pezoporus flaviventris</i>	Western Ground Parrot	3	Critically Endangered	Critically Endangered	1900	
<i>Phaethon rubricauda</i>	Red-tailed Tropicbird	1	Migratory and Priority 4	Migratory	2000	
<i>Pluvialis fulva</i>	Pacific Golden Plover	117	Migratory	Migratory	1978	2018
<i>Pluvialis squatarola</i>	Grey Plover	218	Migratory	Migratory	1977	2018
<i>Psophodes nigrogularis</i>	Western Whipbird	2	Endangered or Priority 4	-	2001	
<i>Psophodes nigrogularis nigrogularis</i>	Western Whipbird (Western Heath)	1	Endangered	Endangered	-	
<i>Puffinus huttoni</i>	Hutton's Shearwater	3	Endangered	-	2006	2018
<i>Stercorarius antarcticus lonnbergi</i>	Brown Skua, Subantarctic Skua	11	Priority 4	-	1977	2018
<i>Stercorarius parasiticus</i>	Arctic jaeger, Arctic Skua	4	Migratory	Migratory	1977	2018

Appendix 5 – Conservation Significant Fauna – DBCA Database

SPECIES	COMMON NAME	COUNT	WA STATUS	EPBC STATUS	FIRST RECORD	MOST RECENT RECORD
<i>Thalassarche cauta cauta</i>	Shy Albatross	2	Vulnerable	Migratory	1998	2005
<i>Thalassarche chlororhynchos</i>	Atlantic Yellow-nosed Albatross	15	Vulnerable	Migratory	1900	2007
<i>Thalassarche melanophris</i>	Black-browed Albatross	7	Endangered	Migratory	1916	2013
<i>Thalasseus bergii</i>	Crested Tern	359	Migratory	Migratory	1977	2018
<i>Thinornis rubricollis</i>	Hooded Plover, Hooded Dotterel	19	Priority 4	-	1977	2015
<i>Tringa brevipes</i>	Grey-tailed Tattler	81	Migratory and Priority 4	Migratory	1999	2016
<i>Tringa nebularia</i>	Common Greenshank	169	Migratory	Migratory	1977	2018
<i>Tringa stagnatilis</i>	Marsh Sandpiper	10	Migratory	Migratory	2000	2017
<i>Xenus cinereus</i>	Terek Sandpiper	6	Migratory	Migratory	1978	2008
<i>Zanda baudinii</i>	Baudin's Cockatoo	110	Endangered	Endangered	1977	2018
<i>Zanda latirostris</i>	Carnaby's Cockatoo	295	Endangered	Endangered	1998	2018
<i>Zanda sp.</i>	White-tailed Black Cockatoo	70	-	-	1978	2018
FISH						
<i>Geotria australis</i>	Pouched Lamprey	1	Priority 3	-	-	
INVERTEBRATES						
<i>Helicarion castanea</i>	A Helicarionid Land Snail	1	Extinct	-	1998	2007
<i>Hylaeus globuliferus</i>	Woolybush Bee	1	Priority 3	-	1929	
<i>Trioza barrettiae</i>	Banksia brownii Plant-louse	1	Endangered	Endangered	2011	
<i>Westralunio carteri</i>	Carter's Freshwater Mussel	2	Vulnerable	Vulnerable	1905	
<i>Zephyrarchaea mainae</i>	Main's Assassin Spider	8	Vulnerable	-	1983	2008

Appendix 5 – Conservation Significant Fauna – DBCA Database

SPECIES	COMMON NAME	COUNT	WA STATUS	EPBC STATUS	FIRST RECORD	MOST RECENT RECORD
MAMMALS						
<i>Dasyurus geoffroii</i>	Chuditch, Western Quoll	1	Vulnerable	Vulnerable	1995	
<i>Hydromys chrysogaster</i>	Water-rat, Rakali	4	Priority 4	-	1899	2014
<i>Isoodon fusciventer</i>	Quenda, Southwestern Brown Bandicoot	59	Priority 4	-	1899	2016
<i>Macrotis lagotis</i>	Bilby, Dalgyte, Ninu	1	Vulnerable	Vulnerable	1969	
<i>Notamacropus irma</i>	Western Brush Wallaby	1	Priority 4	-	-	
<i>Parantechinus apicalis</i>	Dibbler	6	Endangered	Endangered	1956	1988
<i>Phascogale tapoatafa wambenger</i>	South-western Brush-tailed Phascogale, Wambenger	3	Conservation Dependent	-	1982	2017
<i>Potorous gilbertii</i>	Gilbert's Potoroo	1	Critically Endangered	Critically Endangered	-	
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum, Ngwayir	238	Critically Endangered	Critically Endangered	1899	2020
<i>Setonix brachyurus</i>	Quokka	3	Vulnerable	Vulnerable	1899	1905
REPTILES						
<i>Elapognathus minor</i>	Short-nosed Snake	4	Priority 2	-	1960	1961

APPENDIX 6

Likelihood of Occurrence Assessment

Appendix 6 – Likelihood of Occurrence Assessment

SPECIES (COMMON NAME)	STATUS	HABITAT	HABITAT PRESENT	LIKELIHOOD OF OCCURENCE
BIRDS				
<i>Actitis hypoleucos</i> (Common Sandpiper)	Migratory	Coastal wetlands and some inland wetlands, with varying levels of salinity. Mostly found around muddy margins or rocky shores and rarely on mudflats.	N	Unlikely – unsuitable habitat
<i>Apus pacificus</i> (Fork-tailed Swift, Pacific Swift)	Migratory	Mostly inland plains but sometimes above foothills or in coastal areas. Cliffs, beaches and islands. Also occur over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh, treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. Occasionally above rainforests, wet sclerophyll forest or open forest or plantations of pines.	N	Unlikely – unsuitable habitat
<i>Ardenna carneipes</i> (Flesh-footed Shearwater)	Vulnerable	Subtropics over continental shelves and slopes and occasionally inshore waters. Breed in burrows on sloping ground in coastal forest, scrubland, shrubland or grassland. Burrow substrate must be sufficiently deep and friable, areas of rock, deep ground litter or dense vegetation avoided.	N	Unlikely – unsuitable habitat
<i>Ardenna grisea</i> (Sooty shearwater)	Migratory	Breeds on subtropical and sub-Antarctic islands, and mainland New Zealand. Nest in burrows or rock crevices on coastal slopes, ridges and cliff tops, in herbfields, tussock grassland or forest.	N	Unlikely – unsuitable habitat
<i>Ardenna tenuirostris</i> (Short-tailed shearwater)	Migratory	Migratory ocean birds. Breeding colonies along Australian south coast including Western Australia. Burrow is sandy headlands amongst low lying vegetation like bower spinach and tussock grasses.	N	Unlikely – unsuitable habitat

Appendix 6 – Likelihood of Occurrence Assessment

SPECIES (COMMON NAME)	STATUS	HABITAT	HABITAT PRESENT	LIKELIHOOD OF OCCURENCE
<i>Arenaria interpres</i> (Ruddy turnstone)	Vulnerable	Coastal regions with exposed rock coast lines or coral reefs or near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches. Occasionally found on sand, coral or shell beaches, shoals, cays and dry ridges of sand or coral and in estuaries, harbours, bays and coastal lagoons, among low saltmarsh or on exposed beds of seagrass, around sewage ponds and on mudflats. In south-west Australia, it may occur on pebble-strewn shores of saltlakes near the coast. Occasionally live away from coastal areas in habitats such river beds, and on inland lakes and adjacent farmland. Forage between supralittoral and lower littoral foreshore zones often in banks of seaweed or other tide-wrack.	N	Unlikely – unsuitable habitat
<i>Atrichornis clamosus</i> (Noisy Scrub-bird, Tjimiluk)	Endangered	Dense, unburnt understorey vegetation of low forest, scrub thicket and occasionally heath that occur in gullies, drainage lines and lowland areas.	N	Unlikely – Currently only known in two subpopulations - Two Peoples Bay Nature Reserve to Cheyne Beach (Mainland) and Bald Island (offshore from Cheyne Beach).
<i>Botaurus poiciloptilus</i> (Australasian Bittern)	Endangered	Wetlands with tall dense vegetation in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. Permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and reeds or cutting grass growing over a muddy or peaty substrate.	N	Unlikely – unsuitable habitat

Appendix 6 – Likelihood of Occurrence Assessment

SPECIES (COMMON NAME)	STATUS	HABITAT	HABITAT PRESENT	LIKELIHOOD OF OCCURENCE
<i>Calidris acuminata</i> (Sharp-tailed Sandpiper)	Migratory	Muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation including lagoons, swamps, lakes pools near the coast, dams, waterholes, soaks, bore drains, bore swamps, salt pans and hypersaline salt lakes inland. Also occur in saltworks and sewage farms. Utilise flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. Use coastal mudflats after ephemeral terrestrial wetlands have dried out. Occasionally occur on rocky shores and rarely on exposed reefs.	N	Unlikely – unsuitable habitat
<i>Calidris alba</i> (Sanderling)	Migratory	Almost always found on the coast, mostly on open sandy beaches exposed to open sea-swell, and also on exposed sandbars and spits, and shingle banks. Forage in the wave-wash zone and amongst rotting seaweed.	N	Unlikely – unsuitable habitat
<i>Calidris canutus</i> (Red Knot)	Endangered	Intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours. Occasionally on terrestrial saline wetlands near the coast.	N	Unlikely – unsuitable habitat
<i>Calidris ferruginea</i> (Curlew Sandpiper)	Critically Endangered	Intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. Less often, recorded inland around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. Fresh and brackish water. Occasionally recorded around floodwaters.	N	Unlikely – unsuitable habitat

Appendix 6 – Likelihood of Occurrence Assessment

SPECIES (COMMON NAME)	STATUS	HABITAT	HABITAT PRESENT	LIKELIHOOD OF OCCURENCE
<i>Calidris ruficollis</i> (Red-necked Stint)	Migratory	Coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and occasionally protected sandy or coralline shores. Have been recorded on exposed or ocean beaches, stony or rocky shores, reefs or shoals. Also occur in saltworks and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in saltflats. Sometimes use flooded paddocks or damp grasslands. Occasionally recorded on dry gibber plains, with little or no perennial vegetation.	N	Unlikely – unsuitable habitat
<i>Calidris tenuirostris</i> (Great knot)	Critically Endangered	Sheltered coastal habitats, with large intertidal mudflats or sandflats including inlets, bays, harbours, estuaries and lagoons. Occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, saltlakes and non-tidal lagoons.	N	Unlikely – unsuitable habitat
<i>Calyptorhynchus banksii naso</i> (Forest red-tailed Black Cockatoo)	Vulnerable	Dense Eucalypt forests receiving >600 mm rainfall especially of <i>Eucalyptus marginata</i> (jarrah), <i>E. diversicolor</i> (karri) and <i>Corymbia calophylla</i> (marri).	N	Possible – Minor foraging habitat available. Unlikely to rely on survey area.
<i>Cereopsis novaehollandiae grisea</i> (Cape Barren Goose) (Recherche Cape Barren Goose)	Vulnerable	Offshore islands, usually granite, in areas of pasture, tussock grass or low heathy scrub.	N	Unlikely – unsuitable habitat
<i>Charadrius leschenaultia</i> (Greater Sand Plover Large Sand Plover)	Vulnerable	Occurs in coastal areas of all states, especially the north-west. Non-breeding habitat is coastal, inhabiting littoral and estuarine habitats including sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, sandy estuarine lagoons, inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs. Occasionally recorded on near-coastal saltworks and saltlakes, including marginal saltmarsh, and on brackish swamps.	N	Unlikely – unsuitable habitat

Appendix 6 – Likelihood of Occurrence Assessment

SPECIES (COMMON NAME)	STATUS	HABITAT	HABITAT PRESENT	LIKELIHOOD OF OCCURENCE
<i>Charadrius mongolus</i> (Lesser Sand Plover)	Endangered	Coastal littoral and estuarine environments. Large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. Occasionally in short saltmarsh or among mangroves, saltworks and near-coastal saltpans, brackish swamps and sandy or silt islands in riverbeds.	N	Unlikely – unsuitable habitat
<i>Dasyornis longirostris</i> (Western Bristlebird)	Endangered	Floristically diverse, closed, near-coastal heaths 1-1.5 m tall with a variety of shrubs and usually abundant sedges and thickets of low Eucalypts.	N	Unlikely – unsuitable habitat
<i>Falco hypoleucos</i> (Grey Falcon)	Vulnerable	Timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. Occurs in arid and semi-arid zones with <500 mm rainfall.	N	Unlikely – unsuitable habitat
<i>Falco peregrinus</i> (Peregrine Falcon)	Other specially protected	Found in most habitat types. Nests on coastal and inland cliffs, open woodlands near water, high artificial structures).	Y	Possibly – May fly over but unlikely to rely on survey area.
<i>Hydroprogne caspia</i> (Caspian Tern)	Migratory	Sheltered coastal embayments (harbours, lagoons, inlets, bays, estuaries and river deltas) with preference for sandy or muddy margins. Near-coastal or inland terrestrial wetlands that are either fresh or saline, especially lakes (including ephemeral lakes), waterholes, reservoirs, rivers and creeks. Artificial wetlands, including reservoirs, sewage ponds and saltworks. Forage in open wetlands, including lakes and rivers.	N	Unlikely – unsuitable habitat
<i>Leipoa ocellata</i> (Malleefowl)	Vulnerable	Semi-arid to arid zones in shrubland and woodland dominated by mallee and wattle species and occasionally Wandoo, Marri and Mallet woodlands.	N	Unlikely – unsuitable habitat
<i>Limosa lapponica</i> (Bar-tailed Godwit)	Migratory	Coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. Often around beds of seagrass and, sometimes, in nearby saltmarsh. Occasionally coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats.	N	Unlikely – unsuitable habitat

Appendix 6 – Likelihood of Occurrence Assessment

SPECIES (COMMON NAME)	STATUS	HABITAT	HABITAT PRESENT	LIKELIHOOD OF OCCURENCE
<i>Limosa limosa</i> (Black-tailed Godwit)	Migratory	Coastal habitats such as sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats, or spits and banks of mud, sand or shell-grit; occasionally recorded on rocky coasts or coral islets. Also found in shallow and sparsely vegetated, near-coastal, wetlands; such as saltmarsh, saltflats, river pools, swamps, lagoons and floodplains. A few inland records, around shallow, freshwater and saline lakes, swamps, dams and bore-overflow and also use lagoons in sewage farms and saltworks.	N	Unlikely – unsuitable habitat
<i>Macronectes giganteus</i> (Southern Giant Petrel)	Migratory	Rarely found on the ground. Within Australia, breeding colonies on Heard Island, Maquarie Island, Australia Antarctic Territory.	N	Unlikely – unsuitable habitat
<i>Numenius madagascariensis</i> (Eastern Curlew)	Critically Endangered	Intertidal mudflats and sandflats, often with beds of seagrass, on sheltered coasts, especially estuaries, mangrove swamps, bays, harbours, lagoons, coastal saltworks and sewage farms.	N	Unlikely – unsuitable habitat
<i>Numenius phaeopus</i> (Whimbrel)	Migratory	Intertidal mudflats of sheltered coasts, harbours, lagoons, estuaries and river deltas, often those with mangroves, but also open, unvegetated mudflats. Occasionally found on sandy or rocky beaches, on coral or rocky islets, or on intertidal reefs and platforms. Use saline or brackish lakes near coastal areas and also saltflats with saltmarsh, or saline grasslands with standing water left after high spring-tides, and in similar habitats in sewage farms and saltfields.	N	Unlikely – unsuitable habitat
<i>Oceanites oceanicus</i> (Wilson's Storm-petrel)	Migratory	Spends most of lide at sea. Breeds on Antarctic Continent and Peninsula, and peri-Antarctic and Subantarctic islands.	N	Unlikely – unsuitable habitat
<i>Oxyura australis</i> (Blue-billed Duck)	Priority 4	Completely aquatic. Deep water in large permanent wetlands and swamps with dense aquatic vegetation.	N	Unlikely – unsuitable habitat
<i>Pandion haliaetus</i> (Osprey)	Migratory	Littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. Mainly coastal areas but occasionally inland along major rivers. Wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes.	y	Possible – may fly over but unlikely to rely on survey area.

Appendix 6 – Likelihood of Occurrence Assessment

SPECIES (COMMON NAME)	STATUS	HABITAT	HABITAT PRESENT	LIKELIHOOD OF OCCURENCE
<i>Pezoporus flaviventris</i> (Western Ground Parrot)	Critically Endangered	Low, dry or swampy near-coastal heathland. Usually in habitat that has remained long unburnt.	N	Unlikely – unsuitable habitat. Current distribution predictions do not include the Vancouver Peninsular.
<i>Phaethon rubricauda</i> (Red-tailed Tropicbird)	Migratory and Priority 4	Marine bird that breeds on coastal cliffs and under bushes on oceanic islands.	N	Unlikely – unsuitable habitat
<i>Pluvialis fulva</i> (Pacific Golden Plover)	Migratory	Coastal habitats, though occasionally around inland wetlands. Beaches, mudflats and sandflats (sometimes in vegetation such as mangroves, low saltmarsh, or beds of seagrass) in sheltered areas including harbours, estuaries and lagoons, and also in evaporation ponds in saltworks. Occasionally recorded on islands, sand and coral cays and exposed reefs and rocks as well as terrestrial wetlands such as fresh, brackish or saline lakes, billabongs, pools, swamps and wet claypans, especially those with muddy margins and often with submerged vegetation or short emergent grass, short (or, occasionally, long) grass in paddocks, crops or airstrips, or ploughed or recently burnt areas. Very occasionally recorded well away from water.	N	Unlikely – unsuitable habitat
<i>Pluvialis squatarola</i> (Grey Plover)	Migratory	Coastal areas including sheltered embayments, estuaries and lagoons with mudflats and sandflats, and occasionally rocky coasts with wave-cut platforms or reef-flats, or reefs within muddy lagoons. Also occur around terrestrial wetlands such as near-coastal lakes and swamps, or salt-lakes. Very occasionally recorded further inland around wetlands or salt-lakes.	N	Unlikely – unsuitable habitat
<i>Psophodes nigrogularis nigrogularis</i> (Western Whipbird (Western Heath))	Endangered	Dense heath-like shrubby thickets on coastal dunes, and mallee woodland or shrubland with an open upperstorey above a dense shrubby understorey. Preferred habitat is usually 2–3 metres tall and dominated by shrubs such as <i>Agonis marginata</i> , hakeas (e.g. <i>Hakea elliptica</i> and <i>H. trifurcata</i>), Showy Dryandra (<i>Banksia formosa</i>), <i>Eutaxia obovata</i> , <i>Acacia mityfolia</i> and Heart-leaf Poison-bush (<i>Gastrolobium bilabum</i>), usually with a dense shrubby understorey, and sometimes intermixed with stunted eucalypts such as Marri and Jarrah.	N	Unlikely – unsuitable habitat. Current distribution predictions do not include the Vancouver Peninsular.

Appendix 6 – Likelihood of Occurrence Assessment

SPECIES (COMMON NAME)	STATUS	HABITAT	HABITAT PRESENT	LIKELIHOOD OF OCCURENCE
<i>Puffinus huttoni</i> (Hutton's Shearwater)	Endangered	Migrate to waters off Australia, particularly southern, western and north-western Australia during non-breeding season.	N	Unlikely – unsuitable habitat
<i>Stercorarius antarcticus lonnbergi</i> (Brown Skua Subantarctic Skua)	Priority 4	Coastal waters or over oceanic zones, less often inshore. Breeds of sub-Antarctic islands.	N	Unlikely – unsuitable habitat
<i>Stercorarius parasiticus</i> (Arctic jaeger, Arctic Skua)	Migratory	Spends life at sea. Breeds in arctic tundra.	N	Unlikely – unsuitable habitat
<i>Thalassarche cauta cauta</i> (Shy Albatross)	Vulnerable	Spends life at sea in subantarctic and subtropical marine waters.	N	Unlikely – unsuitable habitat
<i>Thalassarche chlororhynchos</i> (Atlantic Yellow-nosed Albatross)	Vulnerable	Coastlines, large bays and open seas around southern mainland Australia and Tasmania.	N	Unlikely – unsuitable habitat
<i>Thalassarche melanophris</i> (Black-browed Albatross)	Endangered	Marine species that inhabits Antarctic, subantarctic and temperate waters and occasionally enters the tropics. Forages around the breaks of continental and island shelves and across nearby underwater banks. Breeds on subantarctic and peri-Antarctic islands.	N	Unlikely – unsuitable habitat
<i>Thalasseus bergii</i> (Crested Tern)	Migratory	Islands and coastlines of tropical and subtropical areas. Nest in flat open sites on offshore islands, low-lying coral reefs, sandy or rocky coastal islets, coastal spits, lagoon mudflats or islets in salt pans and sewage works.	N	Unlikely – unsuitable habitat
<i>Thinornis rubricollis</i> (Hooded Plover, Hooded Dotterel)	Priority 4	Inland saline wetlands, littoral zone of beaches and sandy estuaries.	N	Unlikely – unsuitable habitat
<i>Tringa brevipes</i> (Grey-tailed Tattler)	Migratory and Priority 4	Sheltered coasts with reefs and rock platforms or with intertidal mudflats. Intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide. Around shores of rock, shingle, gravel or shells and also on intertidal mudflats in embayments, estuaries and coastal lagoons, especially fringed with mangroves.	N	Unlikely – unsuitable habitat

Appendix 6 – Likelihood of Occurrence Assessment

SPECIES (COMMON NAME)	STATUS	HABITAT	HABITAT PRESENT	LIKELIHOOD OF OCCURENCE
<i>Tringa nebularia</i> (Common Greenshank)	Migratory	Coastal and inland environments, in estuaries and mudflats, mangrove swamps and lagoons, and in billabongs, swamps, sewage farms and flooded crops.	N	Unlikely – unsuitable habitat
<i>Tringa stagnatilis</i> (Marsh Sandpiper)	Migratory	Permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, salt pans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. Occasionally at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes.	N	Unlikely – unsuitable habitat
<i>Xenus cinereus</i> (Terek Sandpiper)	Migratory	Soft wet intertidal mudflats or in sheltered estuaries, embayments, harbours or lagoons. Also recorded on islets, mudbanks, sandbanks and spits, and near mangroves and occasionally in samphire (<i>Halosarcia</i> spp.). Occasionally, on sandy beaches, among seaweed and other debris and in rocky areas and around drying sewage ponds and salt pans if surrounded by mudflats. Brackish coastal swamps, lagoons and dune-lakes; and gravel or rocky edges of estuarine pools and freshwater river-pools. Very occasionally, swampy, grassy or cultivated paddocks near the coast	N	Unlikely – unsuitable habitat
<i>Zanda baudinii</i> (Baudin's Black Cockatoo, Long-billed Black Cockatoo)	Endangered	Eucalypt forests, especially jarrah, marri and karri forest.	N	Possible – Minor foraging habitat available. Unlikely to rely on survey area.
<i>Zanda latirostris</i> (Carnaby's Black Cockatoo, Short-billed Black Cockatoo)	Endangered	Uncleared or remnant native eucalypt woodlands, especially those that contain salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture.	N	Possible – Minor foraging habitat available. Unlikely to rely on survey area.
MAMMALS				
<i>Dasyurus geoffroii</i> (Chuditch, Western Quoll)	Vulnerable	Jarrah forests and woodlands in south-west WA and woodlands, mallee shrublands and heaths along south coast. Occasional records from drier woodland and mallee shrubland in Wheatbelt and Goldfields.	N	Unlikely – unsuitable habitat

Appendix 6 – Likelihood of Occurrence Assessment

SPECIES (COMMON NAME)	STATUS	HABITAT	HABITAT PRESENT	LIKELIHOOD OF OCCURENCE
<i>Isoodon fusciventer</i> (Quenda, Southwestern Brown Bandicoot)	Priority 4	Scrubby, often swampy, vegetation with dense cover up to 1 m high. Often associated with water courses and wetlands.	Y	Possible – suitable habitat, however more likely to occur in the vegetation immediately surrounding Lake Vancouver which will not be impacted.
<i>Hydromys chrysogaster</i> (Water-rat, Rakali)	Priority 4	Burrows on low banks of rivers, lakes, wetlands, estuaries. Requires intact riparian vegetation and bank stability.	N	Unlikely – unsuitable habitat
<i>Macrotis lagotis</i> (Bilby, Dalgyte, Ninu)	Vulnerable	Three main habitats: open tussock grassland on uplands and hills, <i>Acacia aneura</i> (mulga) woodland/shrubland growing on ridges and rises, and hummock grassland in plains and alluvial areas.	N	Unlikely – unsuitable habitat
<i>Notamacropus Irma</i> (Western Brush Wallaby)	Priority 4	Open forest or woodland, particularly open, seasonally-wet flats with low grasses and open scrubby thickets. Occasionally found in mallee and heath-land. Uncommon in karri forest.	N	Unlikely – Unsuitable habitat
<i>Parantechinus apicalis</i> (Dibbler)	Endangered	Vegetation with a dense canopy greater than 1 m high which has been unburnt for at least 10 years.	Y	Possible – unlikely – last recorded in 1988 in Torndirrup National Park (~3 km from Lake Vancouver). Torndirrup has experienced multiple bushfires since and therefore this species is unlikely to persist in this area.
<i>Phascogale tapoatafa wambenger</i> (South-western Brush-tailed Phascogale, Wambenger)	Conservation Dependent	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees.	N	Unlikely – unsuitable habitat
<i>Potorous gilbertii</i> (Gilbert's potoroo)	Critically Endangered	Long-unburnt, dense shrubland on the valley slopes. <i>Melaleuca striata</i> and <i>M. uncinata</i> shrubland between 1.5–2 m tall with 70–100 percent canopy cover, with a dense understorey of sedges including <i>Lepidosperma</i> sp. and <i>Anarthria scabra</i> .	N	Unlikely – unsuitable habitat

Appendix 6 – Likelihood of Occurrence Assessment

SPECIES (COMMON NAME)	STATUS	HABITAT	HABITAT PRESENT	LIKELIHOOD OF OCCURENCE
<i>Pseudocheirus occidentalis</i> (Western Ringtail Possum, Ngwayir)	Critically Endangered	Coastal areas of Peppermint woodland and Peppermint/Tuart associations. Three management areas: Swan Coastal Plain - Peppermint woodlands and Peppermint/Tuart forests; Southern Forests - Jarrah forests; South Coast - near-coastal limestone heath, Jarrah Marri thicket woodland and forest, riparian, Peppermint woodland and Karri forest.	Y	Likely – suitable habitat, known from the area
<i>Setonix brachyurus</i> (Quokka)	Vulnerable	Primarily dense riparian vegetation. Other occasional habitats include heath and shrubland on the mainland coast and offshore islands, Swamp Peppermint (<i>Taxandria linearifolia</i>) dominated swamps in Jarrah (<i>Eucalyptus marginata</i>) forest, swampy shrublands, swordgrass-dominated understorey, regrowth areas of the Karri (<i>E. diversicolor</i>) forest, Bullich (<i>E. megacarpa</i>) swamp forest and Paperbark (<i>Melaleuca</i> spp.) swamp.	Y	Unlikely – Historical records are from 1905. Current distribution predictions do not include the Albany area including the Vancouver Peninsular.
REPTILES				
<i>Elapognathus minor</i> (Short-nosed Snake)	Priority 4	Swamplands and coastlands in SW od WA. Shelters stick ant (<i>Iridomyrmex conifer</i>) nests, as well as dense rushes and reed tussocks.	N	Unlikely – unsuitable habitat
INVERTBERATES				
<i>Hylaeus globuliferus</i> (Woolybush Bee)	Priority 3	Associated with <i>Adenanthos cygnorum</i> and <i>Banksia attenuata</i> .	N	Unlikely – Associated plant species were recorded in the flora survey.
<i>Trioza barrettiae</i> (<i>Banksia brownii</i> Plant-louse)	Endangered	Direct dependence on host species <i>Banksia brownii</i> .	N	Unlikely – <i>Banksia brownii</i> was not recorded in the flora survey.
<i>Westralunio carteri</i> (Carter's Freshwater Mussel)	Vulnerable	Freshwater streams, rivers, reservoirs and lakes within 50-100 km of the coast in the south west of Western Australia	N	Unlikely – unsuitable habitat
<i>Zephyrarchaea mainae</i> (Main's Assassin Spider)	Vulnerable	Unburnt bushland dominated by <i>Agonis flexuosa</i> (weeping peppermint), but occasionally Karri forest. Understorey of sedges (<i>Lepidosperma gladiatum</i> , <i>L. effusu</i>) and other grasses (e.g. <i>Empodisma gracillimum</i>).	Y	Unlikely – Although suitable habitat is present, targeted surveys at this location have not recorded this species.

APPENDIX 7

Fauna Photos

Appendix 7 – Fauna Photos



☉ KOGAN 000000 08/24/2023 03:49:04 12°C/53°F 100%

Black Rat (*Rattus rattus*) Camera 3



☉ KOGAN 000000 08/26/2023 04:23:50 13°C/55°F 100%

Fox (*Vulpes vulpes*) Camera 3

Appendix 7 – Fauna Photos



18 °C 64 °F 2023/08/25 17:56:48

Small bird Camera 4

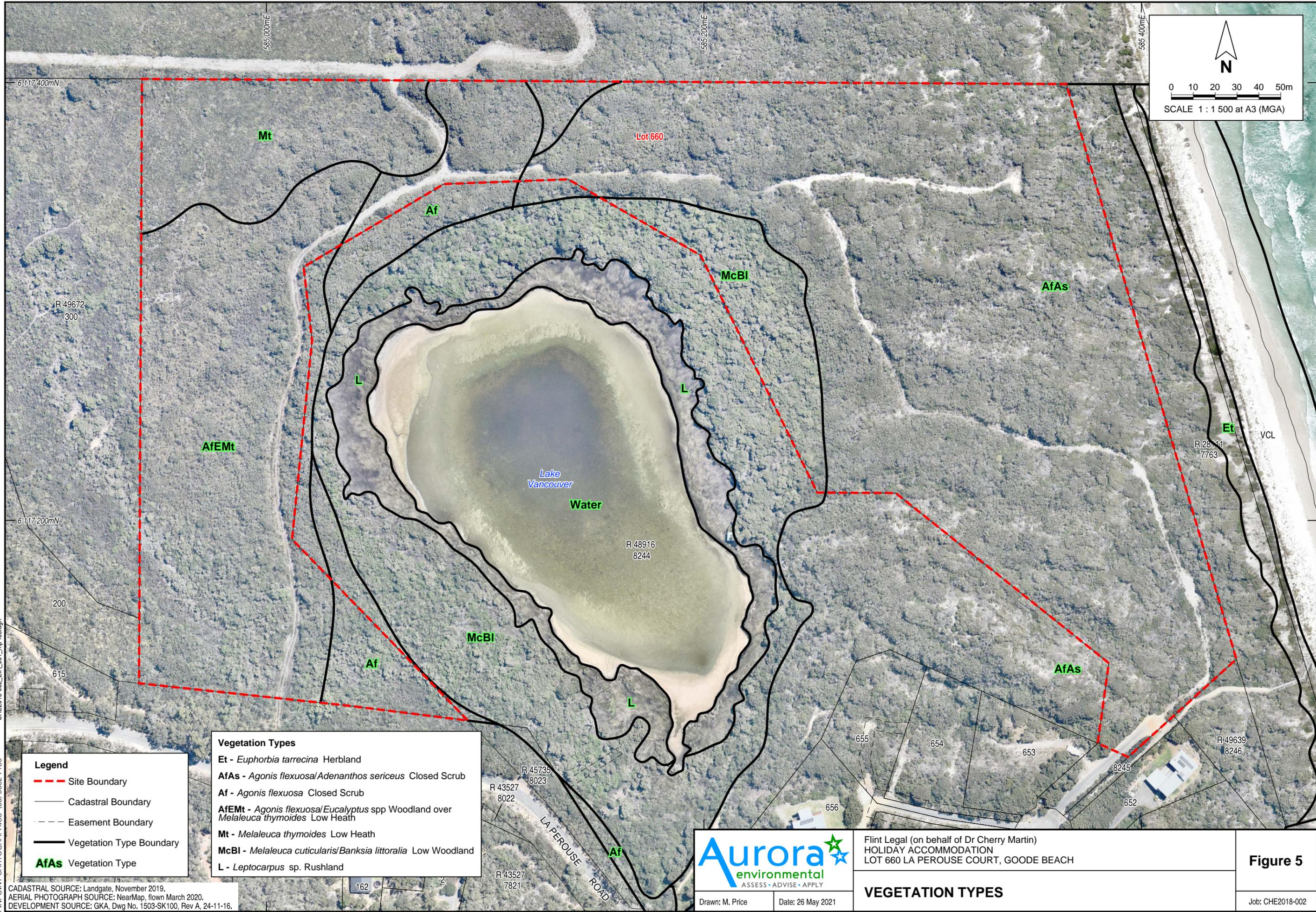


19 °C 66 °F 2023/08/30 12:24:37

King Skink (*Egernia kingii*) Camera 5

APPENDIX 8

Vegetation Mapping (Alan Tingay and Associates, 1992)



N

0 10 20 30 40 50m

SCALE 1 : 1 500 at A3 (MGA)

Lot 660

Mt

Af

McBI

AfAs

Et

AfEMt

Lake Vancouver
Water

L

L

R 48916
8244

McBI

Af

AfAs

L

R 49639
8246

8245

655

654

653

656

652

R 45735
8023

R 43527
8022

R 43527
7821

LA PEROUSE ROAD

Af

162

2

Legend

- - - Site Boundary
- Cadastral Boundary
- Easement Boundary
- Vegetation Type Boundary
- AfAs Vegetation Type

Vegetation Types

- Et** - *Euphorbia tarrecina* Herbland
- AfAs** - *Agonis flexuosa/Adenanthos sericeus* Closed Scrub
- Af** - *Agonis flexuosa* Closed Scrub
- AfEMt** - *Agonis flexuosa/Eucalyptus* spp Woodland over *Melaleuca thymoides* Low Heath
- Mt** - *Melaleuca thymoides* Low Heath
- McBI** - *Melaleuca cuticularis/Banksia littoralis* Low Woodland
- L** - *Leptocarpus* sp. Rushland

Aurora environmental
ASSESS • ADVISE • APPLY

Drawn: M. Price Date: 26 May 2021

Flint Legal (on behalf of Dr Cherry Martin)
HOLIDAY ACCOMMODATION
LOT 660 LA PEROUSE COURT, GOODE BEACH

VEGETATION TYPES

Job: CHE2018-002

Figure 5

PINPOINT CARTOGRAPHICS (08) 9562 7136

CADASTRAL SOURCE: Landgate, November 2019.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown March 2020.
DEVELOPMENT SOURCE: GKA, Dwg No. 1503-SK100, Rev A, 24-11-16.