

**FAUNA SURVEY**  
**PROPOSED LIME STOCKPILE & TRUCK TURN AROUND AREAS**  
**CLEARING PERMIT APPLICATION CPS 10188/1**  
**NULLAKI, WESTERN AUSTRALIA**



Prepared For: Great Southern Lime  
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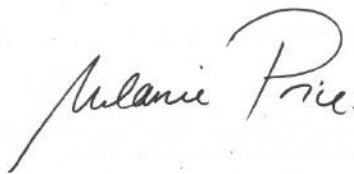
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2023

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## LIST OF ABBREVIATIONS

AHD	Australian Height Datum
DBCA	Department of Biodiversity, Conservation and Attractions (WA)
DBH	Diameter at Breast Height
DCCEEW	Department of Climate Change, Environment, Energy and Water (Commonwealth)
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
ESA	Environmentally Sensitive Area (as defined in EP Act)
GPS	Global Positioning System
ha	Hectare
km	Kilometre
m	Metre
mm	millimetre
MNES	Matters of National Environmental Significance
PMST	Protected Matters Search Tool
WRP	Western Ringtail Possum

## SUMMARY

A Basic Fauna Survey with targeted species assessment was undertaken for two areas proposed for lime storage and a truck turn around at Lot 9005 Rock Cliff Circle, Nullaki in the City of Albany (Figures 1 and 2) to determine the status of habitat and presence of conservation significant species. The survey was undertaken in Spring on 22 September 2023. The areas are currently the subject of clearing permit application (CPS10881/1) for 3.29 ha (Figure 3).

### Fauna Habitat

Fauna habitat, vegetation type and condition are described in Section 5.1 and shown in Figure 4.

### Desktop Investigation

The NatureMap database (Department of Biodiversity, Conservation and Attractions (DBCA) 2023) identified 480 fauna species previously recorded within 20 km of the survey area including: 13 amphibians, 253 birds, 155 invertebrates, 33 mammals (including three introduced species) and 26 reptiles (Appendix 1).

Reports generated by DBCA from NatureMap (Appendix 1) the Threatened and Priority Fauna database (No. 7956, 26 September 2023) and an enquiry run on the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (27 September 2023; Appendix 2) indicated that 32 conservation significant species were identified as potentially being in the area or that habitat for the species may exist (Table A). Some species listed are unlikely to be impacted due to lack of suitable habitat (e.g. oceanic, migratory etc.) and the likelihood of the presence of other species has been considered.

### Targeted Surveys

Targeted surveys were undertaken for the following conservation significant fauna that may occur at the site, based on habitat types present:

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

### Black Cockatoos

Assessment of the proposed lime storage and truck turn around areas indicated that the areas are not suitable to provide roosting or breeding habitat for black cockatoos due to the absence of suitable tree species.

Vegetation type *Banksia littoralis* and *Xanthorrhoea preissii* (Bl Xp) Woodland is likely to provide high quality foraging for black cockatoos. This area comprises approximately 0.3 ha. The balance of the area proposed to be cleared provides little or no foraging due to the lack of proteaceous and other preferred species.



### **Western Ringtail Possums**

No dreys or other signs of WRP (e.g. scats, scratchings) were present and the nocturnal survey did not detect any WRP. Historic burning and the presence of a nearby vermin proof fence indicates that the species does not occur in the area.

### **Main's Assassin Spider**

The presence of suspended leaf litter in *Agonis flexuosa* (Peppermint), the spider's favoured habitat was not present. It is unlikely that the species is present within the area proposed to be cleared.

### **Other Species**

Several common species were identified. Nocturnal species such as chuditch and phascogale were not detected during spotlighting.

### **Management Recommendations**

A management plan has been prepared for the lime pit operations to address risks to fauna habitat, including hygiene, weed and dieback management (Landform Research, 2018). Implementation of this plan should extend to the proposed clearing.

Other recommended measures to reduce impacts include:

- Redesign the lime stockpile area to avoid clearing the Bl Xp woodland area (0.3 ha).
- Delineate clearing extent (e.g. with picket and tape) and ensure that clearing is only undertaken in nominated areas.
- Revegetate areas that are not required to remain clear for road operations. Mulching with removed vegetative material is recommended.

## **1 INTRODUCTION**

### **1.1 BACKGROUND**

Aurora Environmental has been commissioned by Great Southern Lime (the Proponent) to undertake a Basic Fauna Assessment and targeted fauna survey for a lime stockpile and truck turn around area on Lot 9005 Rock Cliff Circle, Nullaki in the City of Albany (Figure 1). A fauna survey has previously been undertaken in proximity to the survey area:

- Level 1 Fauna Survey – Proposed Lime Pit and Access – Clearing Permit Application CPS 8392/1 Nullaki and Youngs Siding, City of Albany, Western Australia (Aurora Environmental, 2019).

This survey considers species listed as threatened under both Western Australian and Australian legislation. The *Biodiversity Conservation Act 2016* provides for species, subspecies or populations of native animals (fauna) to be listed as Specially Protected, Threatened (Critically Endangered, Endangered or Vulnerable) or Extinct in Western Australia. Taking or disturbing of threatened fauna requires Authorisation from the Minister for Environment under Section 40 of the *Biodiversity Conservation Act 2016*. Threatened species are listed in the *Threatened Fauna – Specially Protected Fauna Notice* (Government Gazette, 2018).

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places — defined in the EPBC Act as matters of national environmental significance (MNES). Threatened species area listed on <https://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl>.

### **1.2 THE PROPOSAL**

The Nullaki Lime Pit has been established by Great Southern Lime on Lot 9005 Rock Cliff Circle (Figure 4). However, logistical issues with the haul route meant that trucks hauling the lime need to be loaded adjacent to Lee Road, rather than in the lime pit itself. This means that clearing of native vegetation (3.29 ha) is required for the development of a lime stockpile (2.998 ha) and truck turn around area (0.292 ha). These areas are shown in Figure 2.

### **1.3 SURVEY AREAS**

Both proposed clearing areas are within Lot 9005 which comprises 437 ha of native vegetation. Other areas previously cleared (as approved by previous clearing permits) are shown in Figure 4 (excluding the area shown in pink which represents a withdrawn clearing permit).

The survey areas are shown in Figure 2. The northern area is immediately adjacent to the existing haul road and also contains an access track.

The southern area is immediately adjacent to the haul road and has previously been impacted by grazing of livestock.

## 1.4 PURPOSE AND SCOPE

The survey has been carried out in accordance with:

- Technical Guidance – Terrestrial Fauna Surveys (Environmental Protection Authority (EPA), 2016) to guide Environmental Impact Assessment in Western Australia and determine the presence of rare, endangered and/or threatened fauna species.
- Department of Climate Change, Environment, Energy and Water (DCCEEW) guidelines *EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species* (Department of Sustainability, Environment, Water, Population and Communities, 2012). Note: More recent guidelines are in the process of being rescinded (Referral guideline for 3 WA threatened black cockatoo species Carnaby's Cockatoo (*Zanda latirostris*), Baudin's Cockatoo (*Zanda baudinii*) and the Forest Red-tailed Black-cockatoo (*Calyptorhynchus banksii naso*) Department of Agriculture, Water and the Environment, 2022) and are not considered in this report.
- DCCEEW guidelines *Survey Guidelines for Australia's Threatened Mammals* (Department of Sustainability, Environment, Water, Population and Communities, 2011).

The purpose of this survey was to assess the fauna values of the site and identify the potential for the site to support populations of conservation significant fauna including Black Cockatoos, Western Ringtail Possums and Main's Assassin Spider.

The scope of work included a site visit to assess fauna habitat including the habitat of Threatened fauna species.

The survey was restricted to the proposed clearing area, but the reporting accounts for potential impacts to fauna within adjacent habitat. Findings from the previous fauna survey (Aurora Environmental, 2019) 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 (including spotlighting) to validate the findings from the desktop study, assess habitat types and condition and record opportunistic sightings of fauna species;
- 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 and evening spotlighting.

## 2 DESKTOP ASSESSMENT

Prior to the commencement of the field survey, a desktop assessment was undertaken to identify relevant environmental information pertaining to the survey area and to assist in survey design. The desktop assessment involved a review of:

- General environmental information (climate, soil, topography) relating to the survey area.
- A review of literature to assess the potential habitats present in the survey area (vegetation).
- Existing datasets including previous vegetation mapping of the survey area (Beard, 1979), aerial photography, geology, soils and hydrology information to provide background information on the variability of the environment, likely vegetation units, fauna habitats and to identify areas with potential to contain Threatened and Priority listed fauna species.
- The Department of Biodiversity, Conservation and Attractions (DBCA) NatureMap database for fauna species previously recorded within the study area (DBCA, 2018) (Appendix 1).
- Review of DBCA threatened fauna database (DBCA Reference 7956).
- DCCEEW Protected Matters Search Tool (PMST) to identify communities and species listed under the EPBC Act potentially occurring within the study area (DCCEEW, 2023) (Appendix 2).

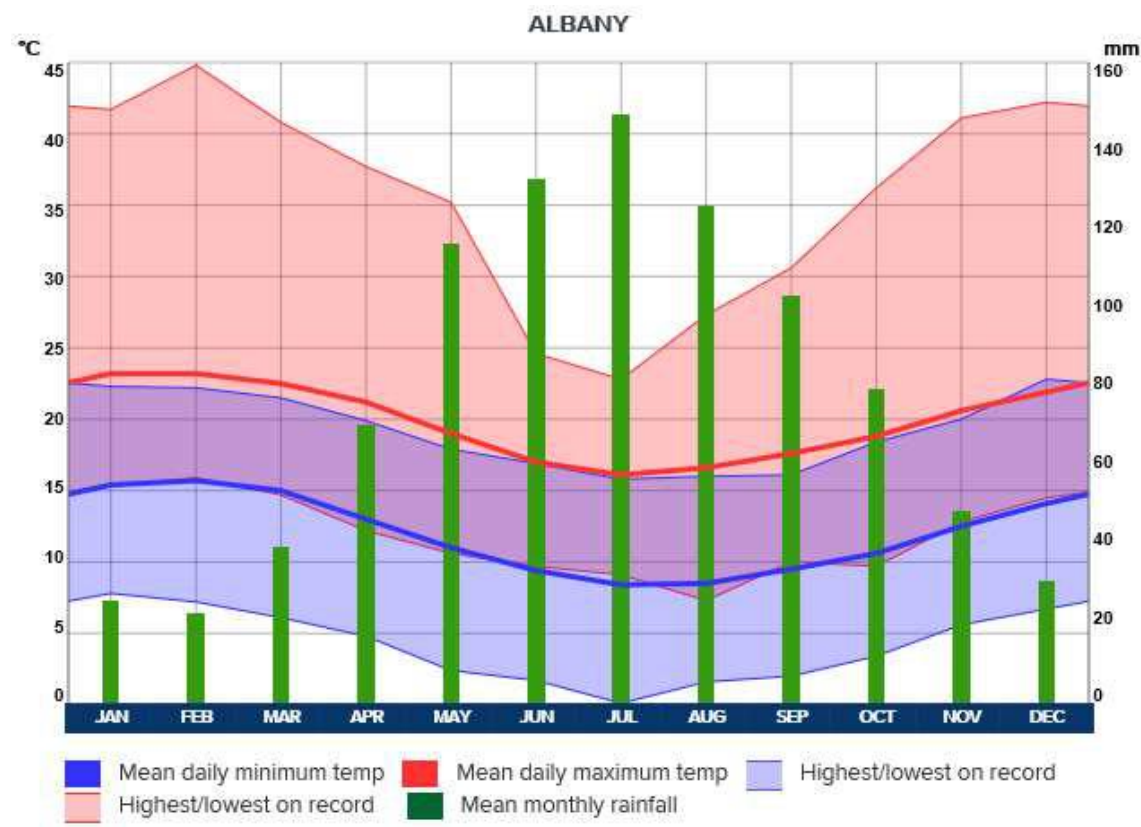
### 2.1 CLIMATE

The Nullaki locality has a Mediterranean climate characterised by warm summers and cool, wet winters. The average annual temperature and rainfall information for the nearest weather station at Albany airport (approximately 35 km north east of the site) is presented in Plate A. Areas closer to the coast, such as Nullaki are likely to experience lower maximum and higher minimum temperatures due to proximity to the ocean and ocean breezes.

The Albany district has a significant number of cool cloudy days with drizzle or showers. As summarised by the Bureau of Meteorology, (BOM, 2011):

*The Southern Ocean is a major factor influencing Albany's climate. The Southern Ocean imparts a moderating influence on Albany through sea breezes in the warmer months and through the effects of a relatively mild and moist air mass at any time of the year. Seasonal variations are mainly due to the north-south movement of sub-tropical ridge. An easterly broad scale flow prevails in summer when the ridge is south of the State. However, the movement of high-pressure cells from west to east along this ridge brings a commonly repeated pattern of wind changes to South Coast locations.*

**PLATE A: CLIMATE AVERAGES, ALBANY**



Source: WeatherZone, 2023; <http://www.weatherzone.com.au/climate/station.jsp?lt=site&lc=9500>

**2.2 REGIONAL BIOGEOGRAPHY**

The survey area lies within the Southwest Botanical Province and forms part of the Southwest Australian Biodiversity Hotspot, one of 34 internationally recognised biodiversity hotspots (Myers *et al.* 2000). It occurs in the eastern portion of the Warren Interim Bio-geographic Regional Area (IBRA), which runs along the coast from just south of Yallingup to south of the Princess Royal Harbour near Albany (IBRA, 2012).

The Warren bioregion is described as a combination of hills, plateaux and plains and features four main soil types including loamy soils supporting Karri forest; red laterites supporting Jarrah-Marri Forests; leached sandy soils in depressions and as plains supporting Low Jarrah Woodlands and Paperbark/Sedge Swamps, and; Holocene marine dunes supporting *Agonis flexuosa* thickets, *Banksia* woodlands and heaths (McKenzie *et al.*, 2002).

**2.3 TOPOGRAPHY, LANDFORM AND SOILS**

Landform in the area comprises sandy dunes interspersed by shallow, broad valley floors. Dune tops form high points in the landscape (26 mAHD) and valley floors may intersect with groundwater (4 mAHD) (Plate B). The areas proposed to be cleared range from 8 – 10 m AHD (northern area) and 6 – 10 m AHD (southern area).

**PLATE B: TOPOGRAPHY**



Soils in the area comprise Meerup podzols over calcareous sand (254NkMRp) and Meerup podzols in siliceous sands (254NkMRs) (Locate V5, 2023; Soil Landscape Mapping – Best Available (DPIRD-027) as shown in Plate C.

## PLATE C: SOILS



Source: Locate V5 (2023) Soil Landscape Mapping - Best Available (DPIRD-027) South Coast and hinterland landforms and soils

### 2.4 HYDROLOGY, WATERCOURSES AND WETLANDS

The proposed lime stockpile and truck turnaround areas do not support any water courses or wetlands. The area supporting *Banksia littoralis* woodland is likely to be associated with shallow groundwater.

### 2.5 LAND USE

The area proposed to be cleared comprises native vegetation, except for access tracks. The southern area has previously been grazed by livestock.

The land east of Lot 9005 comprises Crown Reserve 17464 which contains native vegetation and a section of the Bibbulmun Track.

## 2.6 ENVIRONMENTALLY SENSITIVE AREAS

The nearest environmentally sensitive area (as defined under the *Environmental Protection Act 1986*) is West Cape Howe National Park, 8km to the east of the survey area.

## 2.7 VEGETATION AND FLORA

The vegetation of the area has been mapped on a broad landscape scale by Beard (1979). This mapping forms part of a state-wide mapping and vegetation classification system based on geographic, geological, soil, climate, structure, life form and vegetation characteristics. Beard (1979) recognised one vegetation system within the survey area; the Torndirrup system and one vegetation association; Shrublands: Acacia scrub-heath.

The following vegetation and flora assessments have been undertaken:

- Vegetation Communities Survey – Lot 9005 Rock Cliff Circle, Denmark (Bio Diverse Solutions, 2016).
- Lee Road and Lot 9005 Rock Cliff Circle, Emergency Access Track, Nullaki (PGV Environmental, 2017)
- Spring Flora survey for Lee Road Reserve and Emergency Access Track (PGV Environmental, 2019).

The outcomes of these surveys were:

112 plant species across the Nullaki consisting of 39 families and 70 genera of flora. The most common families were Fabaceae, Cyperaceae, Proteaceae, Myrtaceae and Ericaceae. The flora list includes 103 native species and nine introduced species. One species of priority flora *Banksia sessilis var cordata* (Priority 4) was found. Ten vegetation complexes were identified in the Nullaki area with two types associated with the lime stockpile and truck turn around areas:

- Open Heath: Occurs in swales, flats and on crests of dunes. Where overstorey is present, it consists of low and scattered *Agonis flexuosa*, *Acacia cyclops* or *Banksia attenuata* in flats with low thickets of *Agonis flexuosa* on ridgelines and in swales. The southern areas closest to the coast have a complete absence of overstorey. The understorey consists of a diverse mix of species. The most dominant include: *Hakea varia*, *Allocasuarina humilis*, *Jacksonia horrida*, *Pultenaea reticulata*, *Spyridium globulosum*, *Adenanthos cuneatus* and *Banksia attenuata*. A mix of sedges, herbs and grasses form the basis of the groundcover, some of which include: *Lyginia imberbis*, *Lyginia barbata*, *Lepidosperma squamatum*, *Desmodcladus flexuosus*, *Hypolaena exsulca* and *Opercularia hispidula*.
- Taxandria Woodland: Open woodland with an over storey dominated by *Taxandria juniperina* with sparse *Agonis flexuosa* and *Callistachys lanceolata* as sub-dominants. Understorey is dominated by *Olearia axillaris*, *Spyridium globulosum* and *Pteridium esculentum*.

Adjacent vegetation complexes include *Eucalyptus megacarpa* (bullich) and *E. cornuta* (yate) woodland.



PGV Environmental (2017) described vegetation types with a finer level of vegetation description than the survey by Biodiverse Solutions (2016), defined by the composition and structure of the dominant vegetation, with the following descriptions equating to Open Heath, described above.

- **Af LOW:** *Agonis flexuosa* Low Open Woodland over *Spyridium globulosum*/*Leucopogon insularis* Shrubland over *Loxocarya cinerea*/*Desmocladius flexuosus* Sedgeland. Peppermint trees were 4-5m high and were mostly sparse (<10%) although in some areas the cover was higher. *Spyridium globulosum* and to a lesser extent *Banksia sessilis* were tall shrubs in the mid-canopy but less than 10% cover. Common lower shrub species included *Leucopogon insularis*, *L. parviflorus* and *Olearia axillaris*. A low ground cover of sedge species was usually present including *Loxocarya cinerea*, *Schoenus subfascicularis* and *Desmocladius flexuosus*. The soils were dry, creamy grey sands.
- **Af SH:** *Agonis flexuosa*/*Bossiaea linophylla*/*Allocasuarina humilis*/*Leucopogon insularis* Shrubland over *Loxocarya cinerea*/*Desmocladius flexuosus* Sedgeland. This vegetation type occurs where the Peppermint trees are absent, or the Peppermints were a similar low height around 2m and mixed with other tall shrub species 1-2m high including *Spyridium globulosum*, *Bossiaea linophylla*, *Allocasuarina humilis* and *Hakea prostrata*. A low sedge layer was usually present to 0.3m high including species *Loxocarya cinerea*, *Desmocladius flexuosus* and *Schoenus subfascicularis*. The soils were dry creamy grey sands.

PGV Environmental (2017) did not survey the vegetation associated with the southern area proposed to be cleared (lime stockpile area) which was identified by Biodiverse Solutions (2017) as *Taxandria* woodland. Aurora Environmental noted that the area previously described as *Taxandria* woodland is more correctly identified as:

- **BIXp:** woodland dominated by *Banksia littoralis*, *Taxandria juniperina* and *Agonis flexuosa* with an understorey of *Xanthorrhoea preissii*, *Olearia axillaris* and *Spyridium globulosum*.

A map of vegetation types is included in Figure 5.

## 2.8 FAUNA DIVERSITY

A NatureMap database search was undertaken for an area significantly greater than the survey area to ensure adequate representation of species that may be present. However, the results include species associated with habitats not present in the survey area.

The NatureMap database search identified 480 species recorded within the search area comprising 13 amphibians, 253 birds, 155 invertebrates, 33 mammals (including three introduced species) and 26 reptiles (Appendix 1).

## 2.9 CONSERVATION SIGNIFICANT FAUNA

The EPBC Act Matters of National Environmental Significance Tool (MNES) (Appendix 2), DBCA Threatened Fauna Database and *NatureMap* database (DBCA Reference 7956) identified the presence, or potential presence of 32 conservation significant fauna species within 20 km of the survey area (Table A), excluding those species that are exclusively marine or migratory/marine or where there is no suitable habitat present within the survey area.

Based on the desktop assessment, including consideration of vegetation types, habitat and the range of conservation significant fauna, it was decided that the study area be subject to targeted surveys for the following species:

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

The extent and habitat requirements of these species are documented below. The field portion of the survey included targeted searches for these species and their habitat as described in Section 3.

**TABLE A: POTENTIAL CONSERVATION SIGNIFICANT SPECIES**

SPECIES	STATUS: BIODIVERSITY CONSERVATION ACT 2016	STATUS: EPBC ACT	COMMENT
<i>Atrichornis clamosus</i> (noisy scrub-bird, tjimiluk)	Endangered	Endangered	The noisy scrub-bird has very specific habitat requirements such as dense ground cover/wetlands and leaf litter. Their known range is approximately 45 km <sup>2</sup> combined including at Two Peoples Bay and Bald Island. The species is not likely to be found in the area proposed to be cleared.
<i>Botaurus poiciloptilus</i> (Australasian Bittern)	Endangered	Endangered	The species has been recorded at Lake Saide (1.76 km to the east) but the area proposed to be cleared does not have suitable habitat.
<i>Calyptorhynchus banksii naso</i> (Forest Red-tailed Black-Cockatoo, Karrak)	Vulnerable	Vulnerable	Database indicates that the survey area may contain suitable habitat for this species.
<i>Cynotelopus notabilis</i> (Western Australian pill millipede)	Endangered		The species requires habitat with moist deep litter, logs and rocks which are not present in the survey area. The species is unlikely to occur in the area proposed to be cleared.
<i>Dasyornis longirostris</i> (western bristlebird)	Endangered	Endangered	The Western Bristlebird is restricted to a coastal strip of southern Western Australia from Two Peoples Bay to near East Mount Barren in the eastern end of Fitzgerald River National Park, with a large gap further west of the National Park. Most of the population occurs between Two Peoples Bay and Waychinicup River and have been recorded at a number of different sites in, and near, Fitzgerald River National Park, between Gairdner River and East Mount Barren. The species is not likely to be found in the area proposed to be cleared.
<i>Dasyurus geoffroii</i> (Chuditch, Western Quoll)	Vulnerable	Vulnerable	Database indicates that the area may contain habitat suitable for this species. NatureMaps indicates that there are no recent records for this species in the Nullaki or Albany area. The species is unlikely to be found in the survey area.
<i>Elapognathus minor</i> (short-nosed snake)	Priority 2		Short-nosed snakes are endemic to swamplands and coastlands in the southwest of Western Australia, where they shelter in nests of stick ants ( <i>Iridomyrmex conifer</i> ), as well as dense rushes and reed tussocks. The species could be present in the area proposed to be cleared.
<i>Falco hypoleucos</i> (Grey Falcon)	Vulnerable	Vulnerable	The species occurs in arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia. The species is mainly found where annual rainfall is less than 500 mm, except when wet years are followed by drought, when the species might become marginally more widespread, although it is essentially confined to the arid and semi-arid zones at all times (DCCEEW, 2023: <a href="https://www.environment.gov.au/biodiversity/threatened/species/pubs/929-conservation-advice-09072020.pdf">https://www.environment.gov.au/biodiversity/threatened/species/pubs/929-conservation-advice-09072020.pdf</a> ). The area proposed to be cleared does not contain habitat favoured by the species.
<i>Falco peregrinus</i> (Peregrine Falcon)	Other specially protected fauna		The species may utilise the area but is unlikely to rely on the survey area as the species forages across a large area.

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<i>Falsistrellus mackenziei</i> (western false pipistrelle, western falsistrelle)	Priority 4		The species is usually found in old growth forests. This habitat does not occur in the survey area.
<i>Hydromys chrysogaster</i> (Water-rat, Rakali)	Priority 4		This species lives in burrows on the banks of rivers, lakes and estuaries and feeds on aquatic insects, fish, crustaceans, mussels, snails, frogs, bird eggs and small water birds. This type of habitat is not present in the area proposed to be cleared.
<i>Isoodon fusciventer</i> (quenda, southwestern brown bandicoot)	Priority 4		Quenda inhabit open forest, scrub, and heathland, especially where there is extensive ground cover by shrubs or mat-rushes and shows a preference for the margins of wetlands and waterways over drier habitats. This species may occur in the survey area.
<i>Ixobrychus dubius</i> (Australian little bittern)	Priority 4		The birds are mainly found in freshwater wetlands, where they inhabit dense emergent vegetation of reeds and sedges, and inundated shrub thickets. This habitat is not present in the survey area.
<i>Ixobrychus flavicollis australis</i> (southwest subpop.) black bittern (southwest subpop.)	Priority 2		This species favours dense vegetation and trees at the edges of water bodies. The survey area does not support suitable habitat.
<i>Leipoa ocellata</i> (Malleefowl)	Vulnerable	Vulnerable	The Malleefowl occurs in scrubland and woodland dominated by mallee and wattle species (DCCEEW, 2023a) and is unlikely to occur in the survey area.
<i>Merops ornatus</i> (Rainbow Bee-eater)		Listed Marine Species	Species possibly in the survey area but is unlikely to rely on it.
<i>Myrmecobius fasciatus</i> (numbat, walpurti)	Endangered	Endangered	The numbat is restricted to isolated pockets of south-west Western Australia. Two natural populations remain. One at Dryandra Woodlands, near Narrogin and the other at Perup Nature Reserve, near Manjimup. This species is unlikely to occur in the survey area.
<i>Nannatherina balstoni</i> (Balston's Pygmy Perch)	Vulnerable	Vulnerable	The survey area does not contain habitat suitable for this species.
<i>Nannatherina balstoni</i> (Balston's Pygmy Perch)	Vulnerable	Vulnerable	The survey area does not contain habitat suitable for this species.
<i>Nannoperca pygmaea</i> (Little Pygmy Perch)	Endangered		The survey area does not contain habitat suitable for this species.
<i>Notamacropus irma</i> (western brush wallaby)	Priority 4		This species is found in some areas of mallee and heathland and are uncommon in wet sclerophyll forests. The survey area contains habitat suitable for the species, but they are unlikely to rely on the area proposed to be cleared.
<i>Oxyura australis</i> (blue-billed duck)	Priority 4		The Blue-billed Duck is almost wholly aquatic and is seldom seen on land. The survey area does not contain suitable habitat for this species.
<i>Pandion haliaetus</i> (Osprey)	Migratory birds protected under an international agreement	Migratory Wetlands Species	Species may fly by but is unlikely to rely on the survey area.

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<i>Parantechinus apicalis</i> (Dibbler)	Endangered	Endangered	Dibblers prefer vegetation with a dense canopy greater than 1 m high which has been unburnt for at least 10 years or more. In some locations, the presence of Proteaceous and Myrtaceous flowering shrubs may also be important. The species is not likely to be found in the survey area.
<i>Pezoporus flaviventris</i> (Western Ground Parrot)	Critically Endangered	Critically Endangered	The species only known in more recent times from Waychinicup-Manypeaks, Fitzgerald River National Park and Cape Arid National Park. Further declines have meant that the species is only found in the south-eastern part of Cape Arid National Park and adjacent areas of Nuytsland Nature Reserve. There are thought to be no more than 150 birds left in the wild (DBCA, 2019). The species is unlikely to be present in the survey area.
<i>Phascogale tapoatafa wambenger</i> (South-western brush-tailed Phascogale, Wambenger)	Schedule 6— Fauna that is of special conservation need as conservation dependent fauna		This subspecies has been observed in dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover. Records are less common from wetter forests (DBCA, 2019b). The species is not likely to occur in the area proposed to be cleared.
<i>Pseudocheirus occidentalis</i> (Western Ringtail Possum)	Critically Endangered	Critically Endangered	Database indicates that the area may contain habitat suitable for this species.
<i>Psophodes nigrogularis</i> subsp. <i>nigrogularis</i> (Western Whipbird (western heath))	Endangered or Priority 4		The species is unlikely to utilise the survey area as it does not contain 'long unburnt' habitat consistent with 'dense heath-like shrubby thickets' on coastal dunes, and mallee woodland or shrubland with an open upper storey above a dense shrubby understorey. DCCEEW (2023) indicates that the species is mostly confined to Two Peoples Bay Nature Reserve.
<i>Setonix brachyurus</i> (Quokka)	Vulnerable	Vulnerable	The Quokka is a habitat specialist. In the south of its range, quokkas are strongly linked to complex vegetation structure (minimum of three layers), low densities of woody debris and habitat patchiness (between 0 and 450 m to an alternative vegetation age). The Quokka also has relatively high water requirements, which necessitates close proximity to fresh water throughout the year and the species is often present in riparian and swamp habitat (DoE, 2019b). There is a low possibility that the species occurs in the survey area.
<i>Zanda baudinii</i> listed as <i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo)	Endangered	Endangered	Database indicates that the survey area may contain suitable habitat for this species.
<i>Zanda latirostris</i> listed as <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo)	Endangered	Endangered	Database indicates that the survey area may contain suitable habitat for this species.
<i>Zephyrarchaea mainae</i> (Main's Assassin Spider)	Vulnerable		Database indicates that the species has been found in nearby coastal areas. if suitable habitat is present in the survey area, the species may be found in the survey area.

Note: Government Gazette (2018) Wildlife Conservation (Specially Protected Fauna) Notice 2018. Appendix 2: MNES report (DCCEEW, 2023). Conservation Codes for WA are included in Appendix 3.

## 2.10 CARNABY'S BLACK COCKATOO

Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) 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 (DCCEEW, 2023b). It occupies an area between 32,000km<sup>2</sup> and 60,525km<sup>2</sup> (Department of Parks and Wildlife, 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 semi-arid and sub-humid interior (records from Three Springs District south to the Stirling Range, west to Cockleshell Gully and east to Manmanning) (DCCEEW, 2023b). 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 (DCCEEW, 2023b).

The bird's 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 (Department of Parks and Wildlife, 2013). Suitable hollows can take from 120–150 years to develop. A map prepared by DCCEEW using modelling techniques (Department of Sustainability, Environment, Water, Population and Communities, 2012) indicates that the Nullaki is within the breeding range of the species. However, Birdlife Australia (2018; Plate D) indicates that the birds are not known to breed in the area but may use the area for foraging and roosting in summer months. It is noted by DCCEEW (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 (Department of Parks and Wildlife, 2013).

During the non-breeding season, when most of the cockatoos migrate to the mid-west coast, Swan Coastal Plain and South Coast (Department of Parks and Wildlife, 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* (DCCEEW, 2023b).

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" (DCCEEW, 2023b). 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 Nullaki area. The MNES database indicates that the survey area could contain habitat suitable for the species.

## PLATE D: DISTRIBUTION OF CARNABY'S COCKATOO



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

### 2.11 BAUDIN'S BLACK COCKATOO

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 (DCCEEW, 2023c).

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, 2018c). Habitat comprises heavily forested areas dominated by Marri and other Eucalyptus species (particularly Karri and Jarrah). The distribution of the species comprises 40,000km<sup>2</sup> (DCCEEW, 2023c) as shown in Plate E (Birdlife Australia, 2018).

Baudin's Cockatoo nests in hollows in mature trees such as Marri, Karri, Jarrah and Wandoo in the lower south-west of Western Australia (DCCEEW, 2023b). 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 (DCCEEW, 2023c). Baudin's Black-Cockatoo roosts are generally located in the tallest trees in or near riparian environments or permanent water (DCCEEW, 2023c).

## PLATE E: DISTRIBUTION OF BAUDIN'S BLACK COCKATOO



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

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 (DCCEEW, 2023c) 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 Nullaki area. The MNES database indicates that the area could contain habitat suitable for the species.

### 2.12 FOREST RED-TAILED BLACK-COCKATOO

The Forest Red-Tailed Black-Cockatoo (*Calyptorhynchus banksii naso*) is a sub-species 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 (DCCEEW, 2023c; Plate F). The current distribution is estimated to be 52,198km<sup>2</sup> (DCCEEW, 2023d). The species inhabits dense Jarrah, Karri and Marri forests in areas that receive more than 600mm average rainfall annually (DoE, 2018d).

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 (DCCEEW, 2023d). 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).

#### PLATE F: DISTRIBUTION OF FOREST RED-TAILED BLACK COCKATOO



Source: DCCEEW (2023) [http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\\_id=67034](http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=67034)

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 (DCCEEW, 2023d).

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

#### 2.13 WESTERN RINGTAIL POSSUM

The Western Ringtail Possum (*Pseudocheirus occidentalis*) (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 (DCCEEW, 2023e). While populations of the species on the south west coast of Western Australia appear to prefer a habitat preference for Peppermint trees (*Agonis flexuosa*) (DCCEEW, 2023e), recent studies indicate that the Albany urban population of WRP have a habitat preference for Sheoak (*Allocasuarina fraseriana*), Marri (*Corymbia calophylla*) and Eucalypt (*Eucalyptus marginata* and *E. staeri*) woodlands (Bader *et al.*, 2019). Habitat use may affect densities due to diet and structural factors (Gilfillan, 2008).

In urban areas possums feed on introduced garden species (Department of Parks and Wildlife, 2017) and captive animals fed on peppermint leaves show a preference for fresh, young green leaves rather

than red leaves (Ellis and Jones, 1992). 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, but that many areas with abundant *A. flexuosa* did not support WRPs.

The most inland population of WRP occurs at Perup. 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 7,155km<sup>2</sup> (DCCEEW, 2023e).

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 (DCCEEW, 2023).

NatureMap records indicated that there are no records of WRP in the Nullaki area (Appendix 1) although the species has been recorded in Youngs Siding (Aurora Environmental, 2019). The MNES database indicates that the area could contain habitat suitable for the species.

## **2.14 MAIN'S ASSASSIN SPIDER**

Main's Assassin Spider (*Zephyrarchaea mainae*) is listed as Division 6 – Vulnerable Invertebrate in the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

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 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).

NatureMaps indicates that *Z. mainae* has been found in Crown Reserve 17464 east of Lot 9005 and to the south of the various road reserves in the survey area (Appendix 1).

### **3 RECONNAISSANCE AND FIELD SURVEY METHODOLOGY**

The area of investigation included the proposed lime stockpile and truck turnaround areas on Lot 9005 (Figure 2). The survey was undertaken on 22 September 2023 by Melanie Price of Aurora Environmental, experienced environmental scientist and qualified zoologist with an experienced field assistant (Catherine Hall).

#### **3.1 FAUNA HABITAT ASSESSMENT**

A fauna habitat assessment was undertaken to document the type, condition and extent of habitats within the survey area. Vegetation, landform and soils units present at the subject site have been used to define broad fauna habitat types. The following information was recorded:

- Habitat structure (e.g. vegetation type, presence/absence of structural layers such as ground cover and mid storey).
- Presence/absence of refuge including: density of ground covers, fallen timber (coarse woody debris), hollow-bearing trees and stags and rocks/boulder piles, and the type and extent of each refuge.
- Presence/absence of waterways including type, extent and habitat quality within any waterway.
- Location of the habitat within the survey area in comparison to the habitat within the surrounding landscape.
- Habitat connectivity and identification of wildlife corridors within and immediately adjacent to the survey area.
- Current land use and disturbance history.
- Evaluation of key habitat features and types identified during the desktop assessment relevant to fauna of conservation significance.
- Evaluation of the likelihood of occurrence of conservation significant fauna within the habitat (based on presence of suitable habitat).
- Vegetation condition based on Thackway and Leslie (2006, Appendix 4).

A representative photograph of each habitat type.

#### **3.2 BLACK COCKATOO HABITAT ASSESSMENT**

Habitat used by black cockatoos have been placed into three categories by DCCEEW (Department Sustainability, Environment, Water, Population and Communities, 2012) as shown in Table B:

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

**TABLE B: HABITATS USED BY BLACK COCKATOOS**

HABITAT	BAUDIN'S	CARNABY'S	FOREST RED-TAILED
Breeding	Generally, in woodland or forest, but may also breed in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of karri ( <i>Eucalyptus diversicolor</i> ), marri ( <i>Corymbia calophylla</i> ), wandoo ( <i>E. wandoo</i> ) and tuart ( <i>E. gomphocephala</i> ).	Generally, in woodland or forest, but also breeds in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of salmon gum ( <i>E. salmonophloia</i> ), wandoo, tuart, jarrah ( <i>E. marginata</i> ), flooded gum ( <i>E. rudis</i> ), York gum ( <i>E. loxophleba subsp. loxophleba</i> ), powderbark ( <i>E. accedens</i> ), karri and marri.	Generally, in woodland or forest, but may also breed in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of marri, karri, wandoo, bullich ( <i>E. megacarpa</i> ), blackbutt ( <i>E. patens</i> ), tuart and jarrah.
Night roosting	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.

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

**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 gauge. 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 Karri 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 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:

*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.*

### 3.2.1 Foraging Habitat

Foraging habitat is described in Table C. 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.

**TABLE C: 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., <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.
Foraging: common food items	Mostly marri (seeds, flowers, nectar and grubs) and proteaceous trees and shrubs. Also other native seeds and introduced fruits; insects and insect larvae; pith of kangaroo paw ( <i>Anigozanthos flavidus</i> ); juice of ripe persimmons; tips of <i>Pinus</i> spp. and seeds of apples and pears.	Seeds, flowers and nectar of native proteaceous plant species (for example, <i>Banksia</i> spp., <i>Hakea</i> spp. and <i>Grevillea</i> spp), eucalypts and <i>Callistemon</i> . Also seeds of introduced species including <i>Pinus</i> spp., <i>Erodium</i> spp., wild radish, canola, almonds and pecan nuts; insects and insect larvae; occasionally flesh and juice of apples and persimmons.	Mostly seeds of marri and jarrah, also <i>Eucalyptus caesia</i> , illyarrie ( <i>E. erythrocorys</i> ) and some introduced eucalypts such as river red gum ( <i>E. camaldulensis</i> ) and flooded gum ( <i>E. grandis</i> ), <i>Allocasuarina</i> cones, fruits of snottygobble ( <i>Persoonia longifolia</i> ) and mountain marri ( <i>Corymbia haematoxylon</i> ). On the Swan Coastal Plain, often feed on introduced cape lilac ( <i>Melia azedarach</i> ).

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

### 3.2.2 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 at the time of the survey.

The trees generally favoured by black cockatoos for roosting are included in Table D.

**TABLE D: 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.

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

### 3.3 WESTERN RINGTAIL POSSUM SURVEY

#### 3.3.1 Daytime and Spotlighting Survey

A day time survey was undertaken on 22 September 2023 to locate and record dreys, obvious tree hollows, scats and individual WRPs. The day time survey involved traversing the survey area on foot.

A night time surveys with spotlighting was undertaken to locate and record individual WRPs. This involved searching around areas with trees, on foot, using a LED head torch. The spotlighting also had the potential to identify the presence of other nocturnal mammal species.

#### 3.3.2 Habitat Assessment

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

### 3.4 MAIN’S ASSASSIN SPIDER

The proposed clearing areas were inspected on 22 September 2023. The survey was undertaken to determine the presence of suspended leaf litter under *Agonis flexuosa* stands. Melanie has previously been trained by Dr Mark Harvey (WA Museum) in sampling techniques and the identification of Main’s Assassin Spider.

#### Other Observations

Opportunistic observations of habitat and fauna were undertaken throughout the survey.

## 4 SURVEY LIMITATIONS

### 4.1 DESKTOP LIMITATIONS

The EPBC Act PMST is based on bioclimatic modelling for the potential presence of species. As such, this does not represent actual records of the species in the area. The records from the DBCA searches of threatened flora and fauna provide more accurate information for the general area. However, some records of collections, sightings or trappings cannot be dated and often misrepresent the current range of threatened species.

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, 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.

### 4.2 FIELD SURVEY LIMITATIONS

The EPA (2016a) Technical Guide states flora and fauna survey reports for environmental impact assessment in WA should contain a section describing the limitations of the survey methods used. The limitations and constraints associated with this field survey are discussed in Table E. Based on this assessment, the present survey effort has not been subject to any constraints which affect the thoroughness of the assessment and the conclusions which have been formed.

**TABLE E: FIELD SURVEY LIMITATIONS**

ASPECT	LIMITATION	COMMENT
Sources of information and availability of contextual information.	Nil	Adequate information is available for the survey area, this includes broad scale (1:250,000) mapping by Beard (1979) and digitised by Shepherd <i>et al.</i> (2002), plus vegetation and flora survey (Bio Diverse Solutions, 2016 and 2017) and other studies (Aurora Environmental, 2019 and PGV Environmental 2019).
Scope (what life forms were sampled etc.)	Nil	Following desktop review, reconnaissance and field surveys targeted conservation significant fauna most likely to be present in the survey area.
Proportion of fauna identified, recorded and/or collected.	Minor	The fauna survey was undertaken on 22 September 2023 and comprised a reconnaissance and targeted survey. The fauna assessment sampled those species that can be easily seen, heard or have distinctive signs, such as tracks, scats, diggings, etc. Cryptic species would not have been identified during a reconnaissance survey and seasonal variation within species often requires targeted surveys at a particular time of the year. The fauna assessment was aimed at identifying habitat types and conservation significant terrestrial vertebrate fauna likely to be utilising the survey area. Targeted survey/ sampling for Black Cockatoo habitat, WRP and Main's Assassin Spider occurred.

ASPECT	LIMITATION	COMMENT
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed)	Nil	Adequate coverage of the survey area was undertaken.
Mapping reliability	Nil	The vegetation was mapped using high-resolution ESRI aerial imagery obtained from Landgate, topographical features, previous broad scale mapping (Beard, 1979) and field data and more detailed vegetation mapping, where available. Data was recorded in the field using hand-held GPS tools. Certain atmospheric factors and other sources of error can affect the accuracy of GPS receivers. The GPS units used for this survey are accurate to within $\pm 5$ metres on average. Therefore, the data points consisting of coordinates recorded from the GPS may contain slight inaccuracies.
Timing/weather/season/cycle	Minor	<p>The fauna survey was conducted during Spring (22 September 2023).</p> <p>The weather conditions during the field survey included:</p> <ul style="list-style-type: none"> <li>22 September 2023: Min: 13.0°C, Max: 21.1°C Rainfall: 0 mm Relative humidity: 91%, Westerly wind: 9 km/h MSLP: 1018.9 hPa</li> </ul> <p>Weather conditions listed here are for the closest weather station at Albany Airport (Weatherzone, 2023).</p> <p>Note: Conditions were dry and fine during evening spotlighting.</p> <p>The weather conditions recorded during the survey periods are considered unlikely to have negatively impacted upon the fauna survey.</p> <p>The survey timing is considered appropriate for the fauna field survey.</p>
Disturbances (e.g. fire, flood, accidental human intervention)	Nil	The proposed areas to be cleared have been historically disturbed due to livestock grazing and the presence of vehicle tracks (Good conditions). Most of the area is in Excellent Condition.
Intensity (in retrospect, was the intensity adequate)	Nil	The survey area was sufficiently covered by the zoologist during the survey.
Resources	Nil	Adequate resources were employed during the field survey. 8-person hours were spent undertaking the day time survey and evening spotlighting.
Access restrictions	Minor	Where possible the survey area was accessed on foot and traversed by vehicle.
Experience levels	Nil	The zoologist who executed the survey is suitably qualified and experienced with a Bachelor of Science (Honours) Zoology from the University of Western Australia



## 5 RESULTS AND DISCUSSION

### 5.1 FAUNA HABITAT

Vegetation and fauna habitat in the areas proposed to be cleared is described in Table F and in Figure 5.

- Af LOW:** *Agonis flexuosa* Low Open Woodland over *Spyridium globulosum/ Leucopogon insularis* Shrubland over *Loxocarya cinerea/Desmocladius flexuosus* Sedgeland. Peppermint trees were 4-5m high and were mostly sparse (<10%) although in some areas the cover was higher. *Spyridium globulosum* and to a lesser extent *Banksia sessilis* were tall shrubs in the mid-canopy but less than 10% cover. Common lower shrub species included *Leucopogon insularis*, *L. parviflorus* and *Olearia axillaris*. A low ground cover of sedge species was usually present including *Loxocarya cinerea*, *Schoenus subfascicularis* and *Desmocladius flexuosus*. The soils were dry, creamy grey sands.
- Af SH:** *Agonis flexuosa/Bossiaea linophylla/Allocasuarina humilis/Leucopogon insularis* Shrubland over *Loxocarya cinerea/Desmocladius flexuosus* Sedgeland. This vegetation type occurs where the Peppermint trees are absent, or the Peppermints were a similar low height around 2m and mixed with other tall shrub species 1-2m high including *Spyridium globulosum*, *Bossiaea linophylla*, *Allocasuarina humilis* and *Hakea prostrata*. A low sedge layer was usually present to 0.3m high including species *Loxocarya cinerea*, *Desmocladius flexuosus* and *Schoenus subfascicularis*. The soils were dry creamy grey sands.
- Bl Xp:** woodland dominated by *Banksia littoralis*, *Taxandria juniperina* and *Agonis flexuosa* with an understorey of *Xanthorrhoea preissii*, *Olearia axillaris* and *Spyridium globulosum*.

Anecdotal evidence (landowner) suggests that the Lot 9005 area was last burnt in 1994 and had previously been burnt frequently (every five years) to create conditions suitable for livestock grazing fodder.

The habitat types surveyed are well represented across the Nullaki Peninsula, except the BlXp woodland. The clearing of the lime stockpile and truck turn around areas is not likely to contribute to fragmentation or significant loss of habitat if management activities outlined in *Excavation – Rehabilitation Management Plan*, (Landform Research, 2018) are undertaken. However, the Bl Xp woodland is not a common vegetation or habitat type in the area and is considered significant due to its hydrological (shallow groundwater) and foraging resources (proteaceous species).

Photographs of vegetation types are included in Appendix 5.

**TABLE F: HABITAT ANALYSIS**

HABITAT FEATURES	Af LOW	Af SH	Bl Xp
Presence/absence of refuge including density of ground covers, fallen timber (coarse woody debris), hollow-bearing trees and stags and rocks/boulder	Sparse refuge except for <i>Agonis flexuosa</i> trees. Little to no leaf litter. Little fallen timber. No hollows or	Sparse refuge with little fallen timber. Little to no leaf litter. No trees. No hollows/boulder piles.	Dense ground cover, some leaf litter and fallen timber (coarse woody debris), No hollow-

HABITAT FEATURES	Af LOW	Af SH	BI Xp
piles, and the type and extent of each refuge.	stags. No rocks/boulder piles.		bearing tree. No rocks/boulder piles.
Presence/absence of waterways including type, extent and habitat quality within any waterway.	No wetlands or waterways. Depth to groundwater greater than 2 m.	No wetlands or waterways. Depth to groundwater greater than 2 m.	No wetlands or waterways. Depth to groundwater less than 2 m.
Location of the habitat within the survey area in comparison to the habitat within the surrounding landscape.	Similar to vegetation across Lot 9005.	Similar to vegetation across Lot 9005.	Vegetation type not common on Nullaki Peninsula.
Habitat connectivity and identification of wildlife corridors within and immediately adjacent to the survey area.	Habitat well connected and will remain so after clearing	Habitat well connected and will remain so after clearing	This habitat type is not well connected across the landscape.
Current land use and disturbance history.	Significantly altered due to frequent fire regime.	Significantly disturbed historically from livestock grazing.	Considered to be relictual and shows little signs historical of disturbance
Evaluation of key habitat features and types identified during the desktop assessment relevant to fauna of conservation significance.	Open with clusters of <i>Agonis flexuosa</i> .	Open	Dense vegetation with Proteaceous species
Evaluation of the likelihood of occurrence of conservation significant fauna within the habitat (based on presence of suitable habitat).	Possibly significant to species such as WRP (where present), if well connected.	Not likely to be significant to conservation species	Significant for conservation species that rely on Proteaceous species.
Vegetation condition based on Thackway and Leslie (2006, Appendix 4).	Type 1 Residual (Excellent). Noting that frequent fire is likely to have modified historical habitat.	Type 1 Residual - Type II modified (Good to Excellent). Noting that fire and grazing is likely to have modified historical habitat.	Type 1 Residual (Excellent)

## 5.2 BLACK COCKATOO HABITAT ASSESSMENT

### 5.2.1 Black Cockatoo Breeding Habitat

Mapping (Locate 5 DBCA, 2023; Figure 6) indicates that the nearest nesting sites for white tail black cockatoos is in the Stirling Ranges (80km north-east) and Mount Frankland National Park/ Mount Roe - Mount Lindsay National Parks (60 km north-west). There are two potential breeding hollows 14.6 km to the north west (DBCA Cockatoo Database 7956\_-\_FaunaSearch\_Aurora\_Hall7956\_(WTBC)).

Trees considered potentially suitable for black cockatoos to use as nesting habitat (using DCCEEW criteria – Department of Sustainability, Environment, Water, Population and Communities, 2012) were not observed in the survey areas as the habitat did not contain Eucalyptus species that form hollows.

### 5.2.2 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 C indicates the preferred foraging habitat for each cockatoo species.

The vegetation of the proposed lime stockpile and truck turn around areas are in Good to Excellent condition but other than the Bl Xp woodland, contain few species for foraging for the three species of black cockatoos. Popular foraging species such as Marri (*Corymbia calophylla*), Jarrah (*Eucalyptus marginata*), Sheoak (*Allocasuarina fraseriana*) and Balga (*Xanthorrhoea species*) are absent. Other foraging species (e.g. *Banksia* and *Hakea*) are present, but in low numbers. However, the 0.3 ha area of Bl Xp woodland comprises *Banksia littoralis* and *Xanthorrhoea preissii*, both of which are significant foraging resources.

Other than the Bl Xp woodland, only low quality foraging habitat is present, so most of the area proposed to be cleared is unlikely to significantly impact the three species of Black Cockatoo to the extent that the species would decline.

There are large areas of foraging habitat in the coastal and inland areas of Denmark and Albany. DBCA mapping indicates that potential feeding areas for Carnaby's Black Cockatoos comprises Jarrah forest inland from the coast (Figure 7). There are significant areas of Jarrah forest within 15km, including Denmark Catchment State Forest, Mount Lindesay National Park and other potential foraging habitat (Quarram Nature Reserve, William Bay National Park, West Cape Howe National Park and coastal reserves managed by the City of Albany. The Nullaki Peninsula is largely uncleared, with retention of significant tracts of native vegetation required in the City of Albany Local Planning Scheme No. 1.

### 5.2.3 Black Cockatoo Roosting Habitat

A review of available data (Locate 5, 2023; DBCA-064) indicates that there are roost sites for Black Cockatoos at Lowlands, Torbay and Kronkup with confirmed roosting sites for Carnaby's Black Cockatoos in Albany (Figure 8). There are no known roost sites mapped for Nullaki.

No potential roosting trees were identified in the survey areas due to the generally low nature of the vegetation and absence of tall Eucalyptus species.

### 5.3 WESTERN RINGTAIL POSSUM

No traces of WRP were identified in the areas proposed to be cleared (including dreys, scats, other evidence or evening spotlighting).

### 5.4 MAIN'S ASSASSIN SPIDER

Main's Assassin Spider (MAS) inhabits Peppermint (*Agonis flexuosa*) coastal habitats where it favours 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 in the survey area, suspended leaf litter was absent.

Anecdotal evidence suggests that Lot 9005 was last burnt in 1994 but had been subject to repeated frequent burn at approximately 5-year intervals for decades before that, in order to encourage feed for sheep which were grazed in the area. This may explain why there is an almost complete absence of suspended leaf litter underneath stands of *Agonis flexuosa*.

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

### 5.5 OTHER SPECIES

Other species which were detected as part of the survey included:

- *Australian Raven (Corvus coronoides);*
- *Coastal Western rosella (Platycercus icterotis ssp. icterotis);*
- *Australian Magpie (Gymnorhina tibicen);*
- *New Holland Honeyeater (Phylidonyris novaehollandiae);*
- *Silvereye (Zosterops lateralis);*
- *Stick nest ants (Iridomyrmex conifer species group);*
- *Bothriembryon kingii (snail);*
- *Shingleback Lizard (Tiliqua rugosa);*
- *Motorbike Frog (Litoria moorei);*
- *Quacking Frog (Crinia georgiana) (in the distance);*
- *Slender Tree Frog (Litoria adelaidensis);*
- *Western Banjo Frog (Limnodynastes dorsalis) and*
- *Western Grey Kangaroo (Macropus fuliginosus).*

Introduced species included:

- *Kookaburra (\*Dacelo novaeguineae);*
- *Fox Red (Vulpes vulpes) (scats) and*
- *Rabbit (Oryctolagus cuniculus) (diggings).*

Other:

- Nocturnal species such as Chuditch and Phascogale were not detected during spotlighting.
- White tailed black cockatoos were heard in the distance but the species could not be determined.

## 6 ENVIRONMENTAL APPROVALS AND MANAGEMENT

This section provides advice on potential environmental approvals and referrals required, based on the ecological values identified within the survey area. The survey areas are currently being assessed for a clearing permit under Part V of the *Environmental Protection Act 1986*.

### 6.1 FEDERAL GOVERNMENT

MNES are factors that are protected under the EPBC Act. Referral to DCCEEW under the EPBC Act is triggered if a proposed action has or potentially has a significant impact on any MNES as described in *Significant Impact Guidelines 1.1* (DoE, 2013). Table G shows an assessment of this Project against the MNES listed under the EPBC Act.

**TABLE G: ASSESSMENT OF MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE**

MATTER OF NATIONAL ENVIRONMENTAL SIGNIFICANCE	TRIGGERS FOR REFERRAL	COMMENT AND NEED FOR REFERRAL TO DEE UNDER EPBC ACT
Listed Threatened Species:	Clearing of any known nesting tree.	No trees with suitable hollows are present in the survey area.
Carnaby’s Black Cockatoo (Endangered) Forest Red-tailed Black Cockatoo (Vulnerable) Baudin’s Black Cockatoo (Vulnerable)	Clearing or degradation of any part of a vegetation community known to contain breeding habitat.	No known breeding habitat is present. 130 trees with diameter of greater than 50cm at chest height are present in the survey area of which 74 are proposed to be cleared. However, none contain hollows suitable for Black Cockatoos.
	Clearing of more than 1 ha of quality foraging habitat.	Foraging habitat is marginal due to low numbers of preferred foraging species in most of the proposed clearing areas. Vegetation type Bl Xp woodland (0.3 ha) comprises excellent quality foraging vegetation as it supports <i>Banksia</i> and <i>Xanthorrhoea</i> species. There are large areas (greater than 500 ha e.g. Nullaki Peninsula, Denmark Water Catchment, West Cape Howe National Park and Mt Lindesay National Park) of foraging habitat within 15 km of the survey area.
	Clearing or degradation (including pruning of top canopy) of a known roosting project area.	No known roosting areas have been recorded in the survey area (Locate 5, 2023). Roosting is not likely to occur in the survey areas due to lack of suitable roosting trees.
	Creating a gap or greater than 4 km between patches of Black Cockatoo habitat breeding, foraging or roosting.	Not applicable.

MATTER OF NATIONAL ENVIRONMENTAL SIGNIFICANCE	TRIGGERS FOR REFERRAL	COMMENT AND NEED FOR REFERRAL TO DEE UNDER EPBC ACT
	<p>Uncertainty: Degradation (such as through altered hydrology or fire regimes) of more than 1 ha of foraging habitat.</p>	<p>Not applicable.</p>
<p>Western Ringtail Possum (Critically Endangered)</p>	<p>An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:</p> <ul style="list-style-type: none"> <li>• lead to a long-term decrease in the size of a population</li> <li>• reduce the area of occupancy of the species.</li> <li>• fragment an existing population into two or more populations.</li> <li>• adversely affect habitat critical to the survival of a species</li> <li>• disrupt the breeding cycle of a population.</li> <li>• modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.</li> <li>• result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.</li> <li>• introduce disease that may cause the species to decline, or</li> <li>• interfere with the recovery of the species.</li> </ul>	<p>No WRP were detected in the area proposed to be cleared although the Af LOW vegetation is considered to be suitable habitat.</p> <p>The clearing is not likely to lead to a long-term decrease in the size of the WRP population or reduce the occupancy of the area.</p> <p>The current population will not be fragmented into two or more populations.</p> <p>The clearing will not adversely affect habitat critical to the survival of WRP.</p> <p>The clearing will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.</p> <p>The clearing will not result in invasive species or disease being introduced to the detriment of WRP.</p> <p>The clearing will not interfere with the recovery of the species as outlined in Western Ringtail Possum (<i>Pseudocheirus occidentalis</i>) Recovery Plan (Department of Parks and Wildlife, 2017).</p>

Based on the assessment, survey and application of significant impact guidelines, it is considered that referral under the EPBC Act is not required.

## 6.2 WESTERN AUSTRALIAN GOVERNMENT

### 6.2.1 Department of Water and Environmental Regulation

Clearing of native vegetation is administered by the Department of Water and Environmental Regulation and requires a clearing permit under Part V of the EP Act, except when a project is assessed under Schedule 6 of the Act or is prescribed by regulation in the *Environmental Protection (Clearing Native Vegetation) Regulations 2004* and not in an Environmentally Sensitive Area.

When preparing a native vegetation clearing application an assessment of the survey area against the ‘Ten Clearing Principles’ is undertaken to determine whether the Project is likely to be at variance to the Principles. The Ten Clearing Principles aim to ensure that potential impacts resulting from removal of native vegetation can be assessed in an integrated way. The clearing principles that relate to fauna are included in Table H with an assessment response based on the survey outcomes described in this document.

**TABLE H: ASSESSMENT AGAINST CLEARING PRINCIPLES THAT RELATE TO FAUNA**

CLEARING PRINCIPLE	ASSESSMENT RESPONSE
a) – Native vegetation should not be cleared if it comprises a high level of biological diversity	<p>Three vegetation/ fauna habitat types were recorded in the survey area (Section 5.1). A search of the <i>NatureMap</i> database (DBCA, 2023) for a foot print covering most of the Nullaki Peninsula and Youngs Siding area identified 480 species recorded within 20 km comprising 13 amphibian, 253 bird, 155 invertebrate, 33 mammal (including three introduced species) and 26 reptile species (Appendix 1).</p> <p>The desktop survey indicated that the area contains numerous vegetation and habitat types which may support a moderate range of flora and fauna species, potentially including conservation significant species. Targeted surveys for selected conservation species indicated:</p> <ul style="list-style-type: none"> <li>• No WRP were detected.</li> <li>• The area does not contain suitable habitat for Main’s Assassin Spider.</li> <li>• Breeding habitat for Black Cockatoos is not present.</li> <li>• Cockatoo foraging habitat in the vegetation types present is marginal due to lack of suitable plant species, except for BI Xp woodland which contains high quality foraging (0.3 ha) with <i>Banksia</i> and <i>Xanthorrhoea</i> species.</li> </ul> <p>The areas proposed to be cleared comprise 3.29 ha. The balance of vegetation remaining on Lot 9005 (originally 437 ha) will be approximately 426 ha (not including historic tracks and firebreaks) which is part of a much larger area of similar habitat on the Nullaki Peninsula which will be retained.</p> <p>The proposal is not considered to be at variance with this clearing principle.</p>
b) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to WA	<p>The targeted fauna survey indicates that with appropriate management, the areas proposed to be cleared will not significantly impact:</p> <ul style="list-style-type: none"> <li>• Three species of Black Cockatoo;</li> <li>• WRP; or</li> <li>• Main’s Assassin Spider.</li> </ul> <p>The proposal is not considered to be at variance with this clearing principle.</p>



<p>h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.</p>	<p>Management measures are proposed to minimise risks to conservation values both on site and in nearby conservation areas, including dieback and weed hygiene, dust and erosion management and rehabilitation.</p> <p>The closest part of the conservation estate is West Cape Howe National Park which is 8 km to the east. The clearing is not likely to impact on this area.</p> <p>The clearing is not considered to be at variance with this clearing principle.</p>
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### 6.3 MANAGEMENT RECOMMENDATIONS

The clearing permit application is for 3.29 ha to provide a limestone stockpile and truck turn around area for the nearby Nullaki lime pit.

Operations and management of the lime pit and associated access ways are outlined in an *Excavation and Rehabilitation Management Plan* (Landform Research, 2018). The plan addresses the following issues, many of which will reduce impacts on fauna and habitat values:

- Groundwater quality and quantity protection;
- Land surface stabilisation and interim rehabilitation, including erosion mitigation and topsoil management;
- Waste management;
- Dust management;
- Dieback management;
- Weed management;
- Contours and final ground surface levels;
- Fire management;
- Site security;
- Transport; and
- Conservation Issues.

Rehabilitation of the lime pit area with local native plant species, including those that provide foraging opportunities for Black Cockatoos are likely to lead to no net loss of fauna habitat, if implemented with target goals for species richness and density.

Preparation of an operation management plan will assist in day-to-day management of fauna issues during the life of the lime pit and should address actions to mitigate:

- Direct and indirect impacts;
- Fauna injury (e.g. due to vehicle movements);
- Reduction of risk of inadvertent trapping of native fauna in open excavations.

Overall the proposed clearing is considered to be manageable in terms of impacts on fauna due to proposed management implementation and its relatively small footprint in a much larger vegetated area.

Other recommended measures to reduce impacts include:

- Redesign the lime stockpile area to avoid clearing the Bl Xp woodland area (0.3 ha).
- Delineate clearing extent (e.g. with picket and tape) and ensure that clearing is only undertaken in nominated areas.
- Reuse trees and vegetation as mulch, for rehabilitation, or other purposes as appropriate.
- Revegetate areas that are not required to remain clear for road operations. Mulching with removed vegetative material is recommended.

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## **APPENDIX 1**

### NatureMap Search Report

Row Labels	COUNT
<b>AMPHI</b>	<b>105</b>
Crinia georgiana	9
Crinia glauerti	17
Crinia pseudinsignifera	16
Crinia subinsignifera	10
Geocrinia leai	13
Heleioporus eyrei	12
Heleioporus inornatus	1
Heleioporus psammophilus	2
Limnodynastes dorsalis	3
Litoria adelaidensis	9
Litoria moorei	6
Metacrinia nichollsi	4
Pseudophryne guentheri	3
<b>BIRD</b>	<b>21096</b>
Acanthiza apicalis	439
Acanthiza chrysorrhoa	298
Acanthiza inornata	28
Acanthorhynchus superciliosus	245
Accipiter cirrocephalus	39
Accipiter cirrocephalus subsp. cirrocephalus	1
Accipiter fasciatus	31
Acrocephalus australis	5
Actitis hypoleucos	36
Aegotheles cristatus	10
Aegotheles cristatus subsp. cristatus	1
Anas castanea	71
Anas gracilis	218
Anas platyrhynchos	2
Anas rhynchotis	64
Anas superciliosa	521
Anhinga novaehollandiae	12
Anthochaera carunculata	469
Anthochaera lunulata	70
Anthus australis subsp. australis	5
Apus pacificus	1
Aquila audax	64
Aquila morphnoides subsp. morphnoides	1
Ardea ibis	3
Ardea modesta	175
Ardea novaehollandiae	1
Ardea pacifica	27
Ardenna carneipes	7
Ardenna tenuirostris	1
Ardeotis australis	1
Arenaria interpres	7
Artamus cinereus	3
Artamus cyanopterus	83
Atrichornis clamosus	2
Aythya australis	15
Barnardius zonarius	274



<i>Biziura lobata</i>	120
<i>Cacatua galerita</i>	1
<i>Cacatua pastinator</i>	3
<i>Cacatua sanguinea</i>	2
<i>Cacomantis flabelliformis</i>	86
<i>Cacomantis flabelliformis</i> subsp. <i>flabelliformis</i>	1
<i>Cacomantis pallidus</i>	23
<i>Calamanthus campestris</i>	2
<i>Calidris acuminata</i>	72
<i>Calidris alba</i> ( <i>Crocethia alba</i> )	5
<i>Calidris canutus</i>	8
<i>Calidris ferruginea</i>	61
<i>Calidris melanotos</i>	5
<i>Calidris ruficollis</i>	174
<i>Calidris subminuta</i>	2
<i>Calidris tenuirostris</i>	19
<i>Calyptorhynchus banksii</i>	107
<i>Calyptorhynchus banksii</i> subsp. <i>naso</i>	55
<i>Calyptorhynchus baudinii</i>	106
<i>Calyptorhynchus latirostris</i>	91
<i>Calyptorhynchus</i> sp.	107
<i>Calyptorhynchus</i> sp. 'white-tailed black cockatoo'	40
<i>Charadrius bicinctus</i>	1
<i>Charadrius leschenaultii</i>	16
<i>Charadrius mongolus</i>	3
<i>Charadrius rubricollis</i>	1
<i>Charadrius ruficapillus</i>	224
<i>Chenonetta jubata</i>	217
<i>Chlidonias leucopterus</i>	1
<i>Chroicocephalus novaehollandiae</i>	271
<i>Chrysococcyx lucidus</i> subsp. <i>plagosus</i>	1
<i>Cincloramphus cruralis</i>	12
<i>Cincloramphus mathewsi</i>	1
<i>Circus approximans</i>	86
<i>Circus assimilis</i>	4
<i>Cladorhynchus leucocephalus</i>	60
<i>Climacteris rufa</i>	5
<i>Colluricincla harmonica</i>	304
<i>Columba livia</i>	1
<i>Coracina novaehollandiae</i>	248
<i>Coracina novaehollandiae</i> subsp. <i>novaehollandiae</i>	1
<i>Corvus coronoides</i>	557
<i>Coturnix pectoralis</i>	4
<i>Coturnix ypsilophora</i>	13
<i>Coturnix ypsilophora</i> subsp. <i>australis</i>	1
<i>Cracticus tibicen</i>	534
<i>Cracticus torquatus</i>	88
<i>Cygnus atratus</i>	425
<i>Dacelo novaeguineae</i>	416
<i>Dacelo novaeguineae</i> subsp. <i>novaeguineae</i>	1
<i>Daphoenositta chrysoptera</i>	12
<i>Dasyornis longirostris</i>	5
<i>Dicaeum hirundinaceum</i>	1

<i>Dromaius novaehollandiae</i>	7
<i>Egretta garzetta</i>	14
<i>Egretta novaehollandiae</i>	271
<i>Egretta sacra</i>	12
<i>Elanus axillaris</i>	32
<i>Elanus caeruleus</i> subsp. <i>axillaris</i>	1
<i>Eseyornis melanops</i>	14
<i>Eolophus roseicapillus</i>	67
<i>Eopsaltria australis</i> subsp. <i>griseogularis</i>	2
<i>Eopsaltria georgiana</i>	305
<i>Eopsaltria griseogularis</i>	5
<i>Epthianura albifrons</i>	28
<i>Erythronyx cinctus</i>	5
<i>Eudypetes chrysocome</i>	1
<i>Eudypetes chrysocome</i> subsp. <i>moseleyi</i>	1
<i>Eudypula minor</i> subsp. <i>novaehollandiae</i>	2
<i>Falco berigora</i>	37
<i>Falco cenchroides</i>	110
<i>Falco longipennis</i>	33
<i>Falco peregrinus</i>	19
<i>Falcunculus frontatus</i>	14
<i>Falcunculus frontatus</i> subsp. <i>leucogaster</i>	4
<i>Fulica atra</i>	176
<i>Gallinula tenebrosa</i>	12
<i>Gallirallus philippensis</i>	19
<i>Gallus gallus</i>	1
<i>Gelochelidon nilotica</i>	1
<i>Gerygone fusca</i>	160
<i>Gerygone fusca</i> subsp. <i>fusca</i>	2
<i>Glareola maldivarum</i>	1
<i>Glossopsitta porphyrocephala</i>	131
<i>Glyciphila melanops</i>	15
<i>Grallina cyanoleuca</i>	249
<i>Haematopus fuliginosus</i>	93
<i>Haematopus longirostris</i>	196
<i>Haliaeetus leucogaster</i>	58
<i>Haliastur sphenurus</i>	49
<i>Hieraaetus morphnoides</i>	104
<i>Himantopus himantopus</i>	195
<i>Hirundo neoxena</i>	237
<i>Hirundo nigricans</i> subsp. <i>nigricans</i>	2
<i>Hydroprogne caspia</i>	130
<i>Ixobrychus flavicollis</i> subsp. <i>australis</i>	1
<i>Ixobrychus flavicollis</i> subsp. <i>australis</i> (southwest subpop.)	1
<i>Ixobrychus minutus</i>	1
<i>Larus dominicanus</i>	1
<i>Larus novaehollandiae</i> subsp. <i>novaehollandiae</i>	1
<i>Larus pacificus</i>	129
<i>Leipoa ocellata</i>	7
<i>Lichenostomus virescens</i>	6
<i>Lichmera indistincta</i>	201
<i>Lichmera indistincta</i> subsp. <i>indistincta</i>	2
<i>Limicola falcinellus</i>	1

<i>Limosa lapponica</i>	37
<i>Limosa limosa</i>	10
<i>Lophoictinia isura</i>	24
<i>Malacorhynchus membranaceus</i>	5
<i>Malurus elegans</i>	409
<i>Malurus splendens</i>	469
<i>Megalurus gramineus</i>	13
<i>Melithreptus brevirostris</i>	10
<i>Melithreptus chloropsis</i>	9
<i>Melithreptus lunatus</i>	254
<i>Microcarbo melanoleucos</i>	165
<i>Microeca fascinans</i>	1
<i>Microeca fascinans subsp. assimilis</i>	1
<i>Morus serrator</i>	29
<i>Myiagra inquieta</i>	25
<i>Neophema elegans</i>	98
<i>Neophema petrophila</i>	13
<i>Ninox novaeseelandiae</i>	99
<i>Nycticorax caledonicus</i>	9
<i>Nycticorax caledonicus subsp. hilli</i>	1
<i>Ocyphaps lophotes</i>	58
<i>Oxyura australis</i>	10
<i>Pachycephala pectoralis</i>	421
<i>Pachycephala pectoralis subsp. fuliginosa</i>	3
<i>Pachycephala rufiventris</i>	11
<i>Pachyptila salvini</i>	1
<i>Pandion haliaetus</i>	71
<i>Pardalotus punctatus</i>	142
<i>Pardalotus punctatus subsp. punctatus</i>	3
<i>Pardalotus punctatus subsp. xanthopyge</i>	4
<i>Pardalotus striatus</i>	51
<i>Pelecanus conspicillatus</i>	493
<i>Petrochelidon ariel</i>	2
<i>Petrochelidon nigricans</i>	223
<i>Petroica boodang</i>	128
<i>Petroica multicolor subsp. campbelli</i>	2
<i>Pezoporus flaviventris</i>	13
<i>Pezoporus wallicus subsp. flaviventris</i>	1
<i>Phalacrocorax carbo</i>	64
<i>Phalacrocorax carbo subsp. novaehollandiae</i>	1
<i>Phalacrocorax melanoleucos</i>	1
<i>Phalacrocorax melanoleucos subsp. melanoleucos</i>	2
<i>Phalacrocorax sulcirostris</i>	288
<i>Phalacrocorax varius</i>	166
<i>Phaps chalcoptera</i>	311
<i>Phaps elegans</i>	22
<i>Phylidonyris melanops</i>	4
<i>Phylidonyris niger</i>	4
<i>Phylidonyris novaehollandiae</i>	588
<i>Platalea flavipes</i>	257
<i>Platalea regia</i>	1
<i>Platycercus icterotis</i>	485
<i>Platycercus icterotis subsp. icterotis</i>	10

<i>Platycercus spurius</i>	3
<i>Platycercus zonarius</i>	1
<i>Plegadis falcinellus</i>	1
<i>Pluvialis fulva</i>	10
<i>Pluvialis squatarola</i>	34
<i>Podargus strigoides</i>	17
<i>Podargus strigoides</i> subsp. <i>brachypterus</i>	3
<i>Podargus strigoides</i> subsp. <i>strigoides</i>	1
<i>Podiceps cristatus</i>	46
<i>Podiceps cristatus</i> subsp. <i>australis</i>	2
<i>Poliocephalus poliocephalus</i>	169
<i>Polytelis anthopeplus</i>	18
<i>Pomatostomus superciliosus</i>	33
<i>Pomatostomus superciliosus</i> subsp. <i>ashbyi</i>	1
<i>Porphyrio porphyrio</i>	15
<i>Porzana fluminea</i>	2
<i>Porzana pusilla</i>	2
<i>Porzana tabuensis</i>	7
<i>Psophodes nigrogularis</i>	1
<i>Psophodes nigrogularis</i> subsp. <i>nigrogularis</i>	1
<i>Pterodroma lessonii</i>	1
<i>Puffinus huttoni</i>	1
<i>Purpureicephalus spurius</i>	280
<i>Recurvirostra novaehollandiae</i>	107
<i>Rhipidura albiscapa</i>	589
<i>Rhipidura fuliginosa</i> subsp. <i>preissi</i>	1
<i>Rhipidura leucophrys</i>	266
<i>Sericornis frontalis</i>	419
<i>Sericornis frontalis</i> subsp. <i>maculatus</i>	1
<i>Smicronis brevirostris</i>	3
<i>Stagonopleura oculata</i>	253
<i>Sterna caspia</i>	4
<i>Sterna hirundo</i>	1
<i>Sterna nereis</i> subsp. <i>nereis</i>	2
<i>Sternula nereis</i>	85
<i>Stictonetta naevosa</i>	3
<i>Stipiturus malachurus</i>	52
<i>Stipiturus malachurus</i> subsp. <i>westernensis</i>	12
<i>Strepera versicolor</i>	47
<i>Streptopelia senegalensis</i>	9
<i>Tachybaptus novaehollandiae</i>	44
<i>Tadorna tadornoides</i>	346
<i>Thalassarche chlororhynchos</i>	4
<i>Thalasseus bergii</i>	213
<i>Thinornis rubricollis</i>	73
<i>Threskiornis molucca</i>	355
<i>Threskiornis spinicollis</i>	176
<i>Todiramphus sanctus</i>	87
<i>Trichoglossus haematodus</i> subsp. <i>rubritorquis</i>	1
<i>Tringa brevipes</i>	6
<i>Tringa nebularia</i>	187
<i>Tringa stagnatilis</i>	4
<i>Turnix varia</i> subsp. <i>varia</i>	2

Turnix varius	39
Turnix velox	2
Tyto alba subsp. delicatula	2
Vanellus miles	6
Zosterops lateralis	523
Zosterops lateralis subsp. gouldi	1
<b>INVERT</b>	<b>1032</b>
Acariformes sp.	22
Aeshnidae sp.	8
Akamptogonus novarae	10
Alboa worooa	1
Ambicodamus marae	2
Amblyomma triguttatum	1
Aname tepperi	3
Ancylidae sp.	2
Aphroteniinae sp.	1
Arachnura higginsi	19
Araneus cyphoxis	7
Araneus senicaudatus	5
Araneus sydneyicus	1
Argoctenus igneus	1
Arkys walckenaeri	10
Artoria cingulipes	1
Artoria flavimana	1
Atelomastix ellenae	34
Atelomastix mainae	16
Athericidae sp.	2
Atriplectididae sp.	2
Austracantha minax	13
Australobus torbay	1
Australomimetes aurioculatus	1
Australomimetes diabolicus	5
Austrarchaea mainae	3
Austrochthonius australis	1
Austrosynthemis cyanitincta	1
Badumna microps	9
Baetidae sp.	1
Baiami tegenarioides	2
Bothriembryon kingii	1
Brentidae sp.	1
Caenidae sp.	12
Calymmachernes angulatus	3
Ceinidae sp.	4
Ceratopogonidae sp.	20
Cercophonius granulatus	1
Cercophonius sulcatus	9
Cherax cainii	26
Cherax crassimanus	1
Cherax preissii	48
Cherax quinquecarinatus	44
Chironominae sp.	26
Coenagrionidae sp.	1
Conicochernes crassus	9

Conicochernes globosus	1
Corduliidae sp.	10
Corixidae sp.	3
Cormocephalus hartmeyeri	15
Cormocephalus michaelsoni	1
Culicidae sp.	1
Cyclosa trilobata	2
Cynotelopus notabilis	97
Diaea socialis	63
Dolichopodidae sp.	1
Dytiscidae sp.	19
Ecnomidae sp.	3
Emertonella maga	2
Empididae sp.	1
Gomphidae sp.	1
Gomphodella aff. maia (SAP)	4
Gordiidae sp.	1
Gripopterygidae sp.	9
Gyrinidae sp.	2
Hemicorduliidae sp.	3
Henicops dentatus	6
Hesperopilio mainae	7
Huntia deepensis	1
Hydraenidae sp.	3
Hydrobiidae sp.	1
Hydrobiosidae sp.	2
Hydrometridae sp.	2
Hydrophilidae sp.	11
Hydropsychidae sp.	4
Hydroptilidae sp.	8
Hylaeus (Macrohylaeus) alcyoneus	1
Hylaeus greavesi	1
Hymenosomatidae sp.	2
Hyridae sp.	2
Ilyodromus ellipticus	1
Ilyodromus sp. 255 (south-west, CB)	2
Isopeda leishmanni	4
Ixodes australiensis	3
Ixodes myrmecobii	1
Lagynochthonius australicus	3
Lampona brevipes	5
Lampona cylindrata	3
Lampona punctigera	1
Larri laffa	5
Leptoceridae sp.	24
Leptophlebiidae sp.	15
Libellulidae sp.	1
Lymnaeidae sp.	1
Maratus linnaei	1
Megamyrmecion penicillatum	1
Megapodagrionidae sp.	5
Menneus wa	1
Missulena granulosa	1

Missulena occatoria	1
Missulena torbayensis	3
Mituliodon tarantulinus	2
Myandra bicincta	1
Nematoda sp.	2
Neoniphargidae sp.	2
Nesidiochernes slateri	3
Notonectidae sp.	1
Novakiella trituberculosa	2
Nunciella aspera	2
Oecobius navus	1
Oligochaeta sp.	13
Oratemnus curtus	1
Orthoclaadiinae sp.	21
Palaemonidae sp.	5
Parastacidae sp.	13
Perthiidae sp.	20
Pholcus phalangioides	2
Phryganoporus candidus	1
Physidae sp.	2
Planorbidae sp.	1
Prionosternum nitidiceps	7
Prionosternum porongurup	1
Protogarypinus giganteus	3
Pseudoteyl vancouveri	13
Raveniella peckorum	1
Richardsonianidae sp.	1
Samichus decoratus	9
Scirtidae sp.	4
Servaea incana	2
Servaea melaina	1
Simuliidae sp.	11
Siphonotus flavomarginatus	26
Sphaeriidae sp.	1
Sphaeromatidae sp.	3
Spinicrus minimus	1
Staphylinidae sp.	2
Storosa tetrica	10
Styloniscidae sp.	1
Symphytognatha picta	1
Synothele rastelloides	1
Synsphyronus callus	1
Synthemistidae sp.	4
Talitridae sp.	1
Tanypodinae sp.	16
Taphiassa globosa	1
Taphiassa robertsi	2
Tasmanoonops mainae	1
Telephlebiidae sp.	4
Temnocephalidea sp.	3
Temnosewellia chaeropsis	1
Tetragnatha demissa	2
Tipulidae sp.	15

Veliidae sp.	12
Venator immansueta	3
Venatrix pullastra	2
Zephyrarchaea mainae	6
<b>MAMMAL</b>	<b>225</b>
Antechinus flavipes subsp. leucogaster	7
Canis lupus subsp. dingo	1
Cercartetus concinnus	9
Chalinolobus gouldii	1
Chalinolobus morio	2
Dasyurus geoffroii	2
Falsistrellus mackenziei	3
Globicephala macrorhynchus	1
Globicephala sp.	1
Hydromys chrysogaster	17
Isoodon fusciventer	9
Isoodon obesulus	2
Isoodon obesulus subsp. fusciventer	13
Macropus fuliginosus	1
Mus musculus	8
Myrmecobius fasciatus	1
Neophoca cinerea	2
Notamacropus irma	1
Nyctophilus geoffroyi	1
Nyctophilus gouldi	2
Phascogale tapoatafa subsp. tapoatafa	10
Phascogale tapoatafa subsp. wambenger	3
Physeter macrocephalus	2
Pseudocheirus occidentalis	17
Rattus fuscipes	31
Rattus rattus	16
Setonix brachyurus	7
Sminthopsis gilberti	2
Sminthopsis griseoventer subsp. griseoventer	23
Tarsipes rostratus	20
Tasmacetus shepherdi	1
Trichosurus vulpecula subsp. vulpecula	1
Vespadelus regulus	7
Vulpes vulpes	1
<b>REPTILE</b>	<b>313</b>
Acritoscincus trilineatus	8
Caretta caretta	5
Chelodina colliei	1
Chelodina oblonga	4
Christinus marmoratus	56
Ctenotus catenifer	4
Ctenotus labillardieri	49
Echiopsis curta	18
Egernia kingii	3
Egernia napoleonis	8
Elapognathus coronatus	21
Elapognathus minor	3
Hemiergis gracilipes	8



Hemiergis peronii subsp. peronii	71
Hydrophis platurus	2
Lerista microtis subsp. microtis	6
Lialis burtonis	1
Liopholis pulchra subsp. pulchra	10
Lissolepis luctuosa	5
Menetia greyii	2
Morethia obscura	1
Notechis scutatus	13
Pogona minor subsp. minor	1
Pseudonaja affinis subsp. affinis	5
Pygopus lepidopodus	4
Rhinoplocephalus bicolor	2
Varanus rosenbergi	2

## NatureMap - Conservation Species

Taxon	Common	Class	WA Status	EPBC Statu
<i>Botaurus poiciloptilus</i>	Australasian bittern	BIRD	EN	EN
<i>Ixobrychus dubius</i>	Australian little bittern	BIRD	P4	
<i>Calyptorhynchus baudinii</i>	Baudin's cockatoo	BIRD	EN	EN
<i>Ixobrychus flavicollis australis</i> (southwest subpop.)	black bittern (southwest subpop.)	BIRD	P2	
<i>Oxyura australis</i>	blue-billed duck	BIRD	P4	
<i>Calyptorhynchus latirostris</i>	Carnaby's cockatoo	BIRD	EN	EN
<i>Dasyurus geoffroii</i>	chuditch, western quoll	MAMMAL	VU	VU
<i>Calyptorhynchus banksii naso</i>	forest red-tailed black cockatoo	BIRD	VU	VU
<i>Zephyrarchaea mainae</i>	Main's assassin spider	INVERTEBRATE	VU	
<i>Leipoa ocellata</i>	malleefowl	BIRD	VU	VU
<i>Atrichornis clamosus</i>	noisy scrub-bird, tjimiluk	BIRD	EN	EN
<i>Myrmecobius fasciatus</i>	numbat, walpurti	MAMMAL	EN	EN
<i>Pandion haliaetus</i>	osprey	BIRD	MI	MI
<i>Falco peregrinus</i>	peregrine falcon	BIRD	OS	
<i>Isoodon fusciventer</i>	quenda, southwestern brown bandicoot	MAMMAL	P4	
<i>Setonix brachyurus</i>	quokka	MAMMAL	VU	VU
<i>Elapognathus minor</i>	short-nosed snake	REPTILE	P2	
<i>Phascogale tapoatafa wambenger</i>	south-western brush-tailed phascogale, wambenger	MAMMAL	CD	
<i>Hydromys chrysogaster</i>	water-rat, rakali	MAMMAL	P4	
<i>Cynotelopus notabilis</i>	Western Australian pill millipede	INVERTEBRATE	EN	
<i>Dasyornis longirostris</i>	western bristlebird	BIRD	EN	EN
<i>Notamacropus irma</i>	western brush wallaby	MAMMAL	P4	
<i>Falsistrellus mackenziei</i>	western false pipistrelle, western falsistrelle	MAMMAL	P4	
<i>Pezoporus flaviventris</i>	western ground parrot	BIRD	CR	CR
<i>Pseudocheirus occidentalis</i>	western ringtail possum, ngwayir	MAMMAL	CR	CR
<i>Psophodes nigrogularis</i>	western whipbird	BIRD	EN or P4	
<i>Psophodes nigrogularis nigrogularis</i>	western whipbird (western heath)	BIRD	EN	EN

15 Birds

9 Mammals

2 Invertebrates

1 Reptile

## **APPENDIX 2**

### Protected Matters Search Tool

Protected Matters - Print Map - September 27th 2023





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: 27-Sep-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](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance (Ramsar)</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	1
<a href="#">Listed Threatened Species:</a>	49
<a href="#">Listed Migratory Species:</a>	61

## 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.

<a href="#">Commonwealth Lands:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	81
<a href="#">Whales and Other Cetaceans:</a>	12
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None
<a href="#">Habitat Critical to the Survival of Marine Turtles:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	None
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">EPBC Act Referrals:</a>	4
<a href="#">Key Ecological Features (Marine):</a>	None
<a href="#">Biologically Important Areas:</a>	8
<a href="#">Bioregional Assessments:</a>	None
<a href="#">Geological and Bioregional Assessments:</a>	None

# Details

## Matters of National Environmental Significance

### Listed Threatened Ecological Communities

[\[ Resource Information \]](#)

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

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Empodisma peatlands of southwestern Australia</a>	Endangered	Community may occur within area	In feature area

### 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
<b>BIRD</b>			
<a href="#">Botaurus poiciloptilus</a> Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Calidris tenuirostris</a> Great Knot [862]	Critically Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Charadrius leschenaultii</a> 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
<a href="#">Charadrius mongolus</a> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Diomedea antipodensis</a> Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Falco hypoleucos</a> Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Limosa lapponica menzbieri</a> Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Pachyptila turtur subantarctica</a> Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Phoebastria fusca</a> Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#">Thalassarche carteri</a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Zanda baudinii listed as Calyptorhynchus baudinii</a> Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Breeding likely to occur within area	In feature area
<a href="#">Zanda latirostris listed as Calyptorhynchus latirostris</a> Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>FISH</b>			
<a href="#">Nannatherina balstoni</a> Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Thunnus maccoyii</a> Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
<b>MAMMAL</b>			
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
<a href="#">Neophoca cinerea</a> Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Parantechinus apicalis</a> Dibbler [313]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Pseudocheirus occidentalis</a> Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat may occur within area	In feature area
<b>PLANT</b>			
<a href="#">Banksia verticillata</a> Granite Banksia, Albany Banksia, River Banksia [8333]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Calectasia cyanea</a> Blue Tinsel Lily [7669]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Drakaea micrantha</a> Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Isopogon uncinatus</a> Albany Cone Bush, Hook-leaf Isopogon [20871]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Kennedia glabrata</a> Northcliffe Kennedia [16452]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Sphenotoma drummondii</a> Mountain Paper-heath [21160]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Verticordia apecta</a> Hay River Featherflower, Scruffy Verticordia [65545]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
<b>REPTILE</b>			
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<b>SHARK</b>			
<a href="#">Carcharias taurus (west coast population)</a> Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Galeorhinus galeus</a> 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
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species			[ Resource Information ]	
Scientific Name	Threatened Category	Presence Text	Buffer Status	
<b>Migratory Marine Birds</b>				
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area	
<a href="#">Ardenna carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only	
<a href="#">Ardenna grisea</a> Sooty Shearwater [82651]		Species or species habitat may occur within area	In buffer area only	
<a href="#">Diomedea antipodensis</a> Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only	
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In buffer area only	
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only	
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only	
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only	
<a href="#">Hydroprogne caspia</a> Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In buffer area only	
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only	

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Onychoprion anaethetus</a> Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Phoebastria fusca</a> Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Thalassarche carteri</a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<b>Migratory Marine Species</b>			
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Caperea marginata</a> Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
<a href="#">Carcharhinus longimanus</a> Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Eubalaena australis as Balaena glacialis australis</a> Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
<a href="#">Lagenorhynchus obscurus</a> Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
<a href="#">Lamna nasus</a> Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In buffer area only
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
<a href="#">Mobula alfredi as Manta alfredi</a> Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Mobula birostris</a> as <a href="#">Manta birostris</a> Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<b>Migratory Terrestrial Species</b>			
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
<b>Migratory Wetlands Species</b>			
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
<a href="#">Arenaria interpres</a> Ruddy Turnstone [872]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#">Calidris alba</a> Sanderling [875]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
<a href="#">Calidris ruficollis</a> Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Calidris subminuta</a> Long-toed Stint [861]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Calidris tenuirostris</a> Great Knot [862]	Critically Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Charadrius mongolus</a> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Gallinago megala</a> Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Gallinago stenura</a> Pin-tailed Snipe [841]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Glareola maldivarum</a> Oriental Pratincole [840]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Limosa limosa</a> Black-tailed Godwit [845]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Numenius minutus</a> Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat known to occur within area	In feature area
<a href="#">Pluvialis fulva</a> Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Pluvialis squatarola</a> Grey Plover [865]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Tringa glareola</a> Wood Sandpiper [829]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area
<a href="#">Tringa stagnatilis</a> Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Xenus cinereus</a> Terek Sandpiper [59300]		Foraging, feeding or related behaviour 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
<b>Bird</b>			
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Ardenna carneipes as Puffinus carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Ardenna grisea as Puffinus griseus</a> Sooty Shearwater [82651]		Species or species habitat may occur within area	In buffer area only
<a href="#">Arenaria interpres</a> Ruddy Turnstone [872]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Bubulcus ibis as Ardea ibis</a> Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#">Calidris alba</a> Sanderling [875]		Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Calidris ruficollis</a> Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
<a href="#">Calidris subminuta</a> Long-toed Stint [861]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
<a href="#">Calidris tenuirostris</a> Great Knot [862]	Critically Endangered	Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Charadrius mongolus</a> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Charadrius ruficapillus</a> Red-capped Plover [881]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Diomedea antipodensis</a> Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Gallinago megala</a> Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
<a href="#">Gallinago stenura</a> Pin-tailed Snipe [841]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
<a href="#">Glareola maldivarum</a> Oriental Pratincole [840]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
<a href="#">Haliaeetus leucogaster</a> 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
<a href="#">Himantopus himantopus</a> Pied Stilt, Black-winged Stilt [870]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
<a href="#">Hydroprogne caspia as Sterna caspia</a> Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Larus pacificus</a> Pacific Gull [811]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
<a href="#">Limosa limosa</a> Black-tailed Godwit [845]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Numenius minutus</a> Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
<a href="#">Onychoprion anaethetus as Sterna anaethetus</a> Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Pachyptila turtur</a> Fairy Prion [1066]		Species or species habitat likely to occur within area	In feature area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat known to occur within area	In feature area
<a href="#">Phoebastria fusca</a> Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Pluvialis fulva</a> Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Pluvialis squatarola</a> Grey Plover [865]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
<a href="#">Puffinus assimilis</a> 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
<a href="#">Recurvirostra novaehollandiae</a> Red-necked Avocet [871]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
<a href="#">Thalassarche carteri</a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thinornis cucullatus as Thinornis rubricollis</a> Hooded Plover, Hooded Dotterel [87735]		Species or species habitat likely to occur within area overfly marine area	In buffer area only
<a href="#">Tringa glareola</a> Wood Sandpiper [829]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area

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



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Maroubra perserrata</a> Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
<a href="#">Nannocampus subosseus</a> Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area	In buffer area only
<a href="#">Notiocampus ruber</a> Red Pipefish [66265]		Species or species habitat may occur within area	In buffer area only
<a href="#">Phycodurus eques</a> Leafy Seadragon [66267]		Species or species habitat may occur within area	In buffer area only
<a href="#">Phyllopteryx taeniolatus</a> Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In buffer area only
<a href="#">Pugnaso curtirostris</a> Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In buffer area only
<a href="#">Solegnathus lettiensis</a> Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In buffer area only
<a href="#">Stigmatopora argus</a> Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In buffer area only
<a href="#">Stigmatopora nigra</a> Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
<a href="#">Urocampus carinirostris</a> Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only
<a href="#">Vanacampus margaritifer</a> Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Vanacampus phillipi</a> Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In buffer area only
<a href="#">Vanacampus poecilolaemus</a> Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area	In buffer area only
<b>Mammal</b>			
<a href="#">Arctocephalus forsteri</a> Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In buffer area only
<a href="#">Neophoca cinerea</a> Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In buffer area only
<b>Reptile</b>			
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<b>Whales and Other Cetaceans</b>			
			<a href="#">[ Resource Information ]</a>
Current Scientific Name	Status	Type of Presence	Buffer Status
<b>Mammal</b>			
<a href="#">Balaenoptera acutorostrata</a> Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only

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

## Extra Information

EPBC Act Referrals				[ <a href="#">Resource Information</a> ]	
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status	
Not controlled action					
<a href="#">Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia</a>	2015/7522	Not Controlled Action	Completed	In feature area	

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<b>Not controlled action</b>				
<a href="#">INDIGO Central Submarine Telecommunications Cable</a>	2017/8127	Not Controlled Action	Completed	In feature area
<a href="#">Seismic Survey, Bremer Basin, Mentelle Basin and Zeewyck Sub-basin</a>	2004/1700	Not Controlled Action	Completed	In feature area
<b>Not controlled action (particular manner)</b>				
<a href="#">INDIGO Marine Cable Route Survey (INDIGO)</a>	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

## Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
<b>Seabirds</b>			
<a href="#">Ardena carneipes</a> Flesh-footed Shearwater [82404]	Foraging (in high numbers)	Known to occur	In buffer area only
<a href="#">Eudyptula minor</a> Little Penguin [1085]	Foraging (provisioning young)	Known to occur	In buffer area only
<a href="#">Hydroprogne caspia</a> Caspian Tern [808]	Foraging (provisioning young)	Known to occur	In buffer area only
<a href="#">Larus pacificus</a> Pacific Gull [811]	Foraging (in high numbers)	Known to occur	In buffer area only
<a href="#">Onychoprion anaethetus</a> Bridled Tern [82845]	Foraging (in high numbers)	Known to occur	In buffer area only
<a href="#">Puffinus assimilis tunneyi</a> Little Shearwater [59363]	Foraging (in high numbers)	Known to occur	In buffer area only
<b>Whales</b>			
<a href="#">Balaenoptera musculus brevicauda</a> Pygmy Blue Whale [81317]	Distribution	Known to occur	In buffer area only
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Migration (north)	Known to occur	In buffer area only



# 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 3**

### Conservation Codes

## Conservation Codes for Western Australian Flora and Fauna

Specially protected fauna or flora are species\* which have been adequately searched for and are deemed to be, in the wild, either rare, at risk of extinction, or otherwise in need of special protection, and have been gazetted as such. Conservation codes have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018*.

### **T Threatened species – Schedules 1-4**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

- **Threatened fauna** is that subset of ‘Specially Protected Fauna’ listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.
- **Threatened flora** is that subset of ‘Rare Flora’ listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

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

### **CR Critically endangered species**

Threatened species considered to be “*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

### **EN Endangered species**

Threatened species considered to be “*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

### **VU Vulnerable species**

Threatened species considered to be “*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife*

*Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

**EX Presumed extinct species**

Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

**EW Extinct in the wild species**

Species that “*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

**Specially protected species**

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

**MI Migratory species**

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

**CD Species of special conservation interest (conservation dependent fauna)**

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

**OS Other specially protected species**

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

**P Priority species**

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

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

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

**Priority 1: Poorly-known species**

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

## **Priority 2: Poorly-known species**

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

## **Priority 3: Poorly-known species**

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

## **Priority 4: Rare, Near Threatened and other species in need of monitoring**

- (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
- (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.
- (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

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

## **Western Australian Ecological Communities**

### **Threatened Ecological Communities**

The BC Act provides for the statutory listing of threatened ecological communities (TECs) by the Minister.

### **Presumed Totally Destroyed (PD)**

An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

### **Critically Endangered (CR)**

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

### **Endangered (EN)**

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

### **Vulnerable (VU)**

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

### **Priority Ecological Communities**

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

#### **Priority One: Poorly-known ecological communities**

Ecological communities that are known from very few occurrences with a very restricted distribution (generally  $\leq 5$  occurrences or a total area of  $\leq 100$ ha).

Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

### **Priority Two: Poorly-known ecological communities**

Communities that are known from few occurrences with a restricted distribution (generally  $\leq 10$  occurrences or a total area of  $\leq 200$ ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

### **Priority Three: Poorly known ecological communities**

- (i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:
- (ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or;
- (iii) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

### **Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.**

- (i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.
- (ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category.
- (iii) Ecological communities that have been removed from the list of threatened communities during the past five years.

### **Priority Five: Conservation Dependent ecological communities**

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

# Commonwealth of Australia Conservation Codes

## Threatened Flora and Fauna

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

### **Extinct**

A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.

### **Extinct in the wild**

A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time:

- a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
- b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

### **Critically endangered**

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

### **Endangered**

A taxon is Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a very high risk of extinction in the wild.

### **Vulnerable**

A taxon is Vulnerable when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a high risk of extinction in the wild.

### **Conservation dependent**

A native species is eligible to be included in the conservation dependent category at a particular time if, at that time:

- a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or
- b) the following subparagraphs are satisfied:
  - i. the species is a species of fish;



- ii. the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;
- iii. the plan of management is in force under a law of the Commonwealth or of a State or Territory;
- iv. cessation of the plan of management would adversely affect the conservation status of the species.

The EPBC Act does not provide for listing in a data deficient category. Where sufficient data (evidence) is unavailable to allow assessment by the Threatened Species Scientific Committee against the criteria for listing, the species are found to be ineligible. A recommendation is made to the Minister to not include the species in any category under the EPBC Act. For reasons of transparency and to inform future research, the Threatened Species Scientific Committee publishes the names of those species found to be data deficient. As data deficient is not a listing category under the EPBC Act, this has no statutory implications and the species is not considered to be listed under the EPBC Act.

### **Threatened Ecological Communities**

Threatened Ecological communities under the EPBC Act are listed in three categories.

#### **Critically endangered**

If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).

#### **Endangered**

If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).

#### **Vulnerable**

If, at that time, an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium-term future (indicative timeframe being the next 50 years).

## **APPENDIX 4**

### Vegetation Condition Scale

**Vegetation Condition Scale (Thackway and Lesslie 2006)**

		Native Vegetation Cover			Non-native Vegetation Cover		
<b>Vegetation Cover Class Criteria</b>	<b>Type 0 - Naturally bare Areas where native vegetation does not naturally persist</b>	<b>Type I Residual</b> Native vegetation community structure, composition, and regenerative capacity intact – no significant perturbation from landuse/land management practice	<b>Type II Modified</b> Native vegetation community structure, composition and regenerative capacity intact – perturbed by land use /land management practice	<b>Type III Transformed</b> Native vegetation community structure, composition and regenerative capacity significantly altered by land use/land management practice	<b>Type IV Replaced Adventive</b> Native vegetation replacement – species alien to the locality and spontaneous in occurrence	<b>Type V Replaced Managed</b> Native vegetation replacement with cultivated vegetation	<b>Type VI Removed</b> Vegetation removal
<b>Diagnostic Criteria</b>	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
<b>Corresponding Keighery (1994) Condition Scale</b>		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 5**

### Survey Area Photos



*Survey effort track and photo locations*

**Fauna Survey - Nullaki Lime Pit – Proposed Lime Stockpile and Truck Turn Around Areas - Clearing Permit Application 10188/1, Lot 9005 Rock Cliff Circle, Nullaki Western Australia**





**Photo 1:**

*Vegetation Type Af SH: Truck Turn Around Area (north)*



**Photo 2:**

*Vegetation Type Af SH: Truck Turn Around Area (north)*

**Fauna Survey - Nullaki Lime Pit – Proposed Lime Stockpile and Truck Turn Around Areas - Clearing Permit Application 10188/1, Lot 9005 Rock Cliff Circle, Nullaki Western Australia**





**Photo 3**

*Vegetation Type Bl Xp*



**Photograph 4**

*Vegetation Type Bl Xp*

**Fauna Survey - Nullaki Lime Pit – Proposed Lime Stockpile and Truck Turn Around Areas - Clearing Permit Application 10188/1, Lot 9005 Rock Cliff Circle, Nullaki Western Australia**





**Photograph 5**

*Vegetation Type Af SH: Proposed lime stockpile area (south). Good to Very Good Condition*



**Photograph 6**

*Vegetation Type Af SH: Proposed lime stockpile area (south). Good to Very Good Condition*

**Fauna Survey - Nullaki Lime Pit – Proposed Lime Stockpile and Truck Turn Around Areas - Clearing Permit Application 10188/1, Lot 9005 Rock Cliff Circle, Nullaki Western Australia**







**Photograph 7**

*Looking across Vegetation Type Af SH to Bl Xp: Area proposed to be cleared for lime stockpile*



**Photograph 8**

*Old livestock trough with grassy weeds*

**Fauna Survey - Nullaki Lime Pit – Proposed Lime Stockpile and Truck Turn Around Areas - Clearing Permit Application 10188/1, Lot 9005 Rock Cliff Circle, Nullaki Western Australia**

