Basic and Targeted Fauna Survey: Black Cockatoo and Western Ringtail Possum

Gavins Road (SLK 0.0 to 12.00), Capel

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CONTENTS

EXECUTIVE SUMMARY **7**
1 INTRODUCTION **9**
1.1 PROJECT OVERVIEW 9
1.2 SURVEY AREA 9
1.3 SCOPE OF WORK 9
1.4 REGULATORY CONTEXT 10
1.4.1 Key Legislation 10
1.4.2 Guidelines 10
1.4.3 EPBC Act Considerations 11
2 METHODS **12**
2.1 DESKTOP REVIEW 12
2.2 FIELD SURVEY 12
2.2.1 Survey Area, Timing, and Personnel 12
2.2.2 Black Cockatoo Survey Methodology 14
2.2.3 Western Ringtail Possum Survey Methodology 17
2.3 SURVEY REFERENCES 18
2.4 ANIMAL ETHICS 19
2.5 LIMITATIONS 19
3 DESKTOP REVIEW **21**
3.1 LOCAL AND REGIONAL CONTEXT 21
3.1.1 Current Land Use and Site Values 21
3.1.2 Interim Biogeographic Regionalisation of Australia (IBRA) and climate 21
3.1.3 Landforms and Soils 22
3.1.4 Wetlands and Watercourses 23
3.1.5 Local Habitat Remaining 24
3.1.6 Habitat Connectivity 24
3.2 FAUNA RECORDS 25
3.2.1 Fauna Recorded Locally 25
3.2.2 Fauna of Conservation Significance 25
3.3 BLACK COCKATOOS 26
3.3.1 Profiles 26
3.3.2 Breeding Requirements 27

3.3.3 Roosting Behaviour....28
3.3.4 Local Context and Records....29
3.4 WESTERN RINGTAIL POSSUM....29
3.4.1 Profile....29
3.4.2 Local Context and Records....30
4 FIELD SURVEY RESULTS....31
4.1 FAUNA HABITATS....31
4.1.1 General Fauna Habitats....31
4.1.2 Suitable DBH Trees and Hollows....36
4.2 FAUNA RESULTS....36
4.2.1 General....36
4.2.2 Conservation Significant Fauna Post-Survey Likelihood of Occurrence....37
4.2.3 Black Cockatoos....38
4.2.4 WRP....40
5 CONCLUSIONS....40
6 REFERENCES....42
APPENDIX A FIGURES....A-45
APPENDIX B CONSERVATION CODES....B-46
APPENDIX C POTENTIAL FAUNA LIST AND FAUNA RECORDED....B-48
APPENDIX D THREATENED FAUNA EVALUATION....D-60
APPENDIX E BLACK COCKATOO FORAGING PLANTS....E-61
APPENDIX F TREE SURVEY RESULTS....F-62
APPENDIX G HOLLOW ASSESSMENT....G-71

Figures

Figure A.1 Survey area....A-45
Figure A.2 Desktop Study Area....A-45
Figure A.3 Fauna habitats....A-45
Figure A.4 Suitable DBH trees and black cockatoo foraging habitat quality....A-45
Figure A.5 Nocturnal survey results....A-45

Tables

Table 1-1 Environmental legislation that may be relevant to the Project....10
Table 2-1 Vegetation structural classes (Keighery, 1994)....13

Table 2-2 Vegetation condition scale (EPA, 2016).....13

Table 2-3 Fauna habitat quality categories and descriptions (SW Environmental, undated).....14

Table 2-4 Suitable DBH tree and hollow classes and descriptions.....16

Table 2-5 Foraging habitat category and description as a high-level guide and to be used with consideration of site context, timing and other factors.....17

Table 2-6 Assessment of survey limitations.....19

Table 3-1 Soil landscape systems intersecting the Survey Area (Schoknecht et al., 2004).....22

Table 3-2 Areas of DBCA reserves and native vegetation remaining within the foraging distances (6-12 km) from the survey area (Landgate, 2024).....24

Table 3-3 DBCA roosts within 12 km.....29

Table 4-1 Fauna habitat types and vegetation descriptions of the Survey Area.....32

Table 4-2 Fauna recorded within the Survey Area.....36

Table 4-3 Conservation significant fauna that may occur within the Survey Area, based on habitat suitability and field observations.....37

Table 4-4 Black cockatoo foraging species across habitat types that contained Primary or Secondary foraging spp. 39

Abbreviations and acronyms

Organisations	
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Federal Department of Climate Change, Energy, the Environment and Water
DWER	WA Department of Water and Environmental Regulation
EPA	Environmental Protection Authority
Common Terms	
DSA	Desktop Survey Area – Survey Area plus a 10 km buffer
FRTBC	Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii subsp. naso*)
GIS	Geographic Information Systems
MNES	Matters of National Environmental Significant
Project	The proposed action
South West	SW
SPRAT	Species Profile and Threats
SLK	Straight line kilometres
Survey Area	26.15 ha, of which circa 7.42 ha is vegetation within road reserve at 0.00 and 12.00 SLK, Gavins Road, Shire of Capel
the Shire	the Shire of Capel
WA	Western Australia

WRP	Western Ringtail Possum
Legislation	
BC Act	*Biodiversity Conservation Act 2016* (WA)
BC Regs	*Biodiversity Conservation Regulations 2018* (WA)
EP Act	*Environmental Protection Act 1986* (WA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Federal)
Measurements	
ha	Hectare
km	Kilometre
m	Metre

Executive Summary

The Shire of Capel (herein referred to as 'the Shire') is proposing to undertake maintenance and minor road widening between 0.00 and 12.00 straight line kilometres (SLK) on Gavins Road (approximately 12 km in length), between Capel-Boyanup Road and Boundary Road, Capel (Figure A.1, Appendix A). The Survey Area includes 26.15 hectares (ha) of which approximately 7.42 ha is native vegetation. The Survey Area occurs within the local government authority (LGA) boundary of the Shire of Capel, 1.4 km northeast of the township of Capel. SW Environmental were engaged to conduct Basic and Targeted fauna surveys to inform planning and environmental approvals required by the Shire.

Field work consisted of a diurnal site visit on the 14th of January 2025 and nocturnal spotlighting on non-consecutive nights of the 21st and 23rd of January 2025. Six fauna habitat types were recorded within the Survey Area:

1. Jarrah closed forest over Peppermints and *Melaleuca preissiana* on grey-brown loamy sand (0.19 ha)
2. *Banksia attenuata* and *Banksia ilicifolia* woodland with Jarrah on grey sand (1.42 ha)
3. Marri mid open forest and isolated paddock trees over scattered Peppermints and Woody pear small trees on grey-brown sandy or sandy-clay loam (4.47 ha)
4. *Melaleuca preissiana* or *Melaleuca rhaphiophylla* low forest on grey-brown clay-loam or sandy clay-loam (1.12 ha)
5. Planted *Eucalyptus* spp. trees (0.23 ha)
6. Cleared weedy grasses and herbs (10.91 ha)

An additional 7.82 ha was mapped as Road (R).

Searches within the Desktop Study Area (10 km) yielded 211 vertebrate terrestrial fauna species records; 10 amphibians, 163 birds, 17 mammals, and 21 reptiles. Of these, 17 taxa were of conservation significance. Additionally, two freshwater fish, a pouched lamprey, mussel, crayfish, two arachnids and one insect of significance were also returned. Conservation significant fauna recorded during survey included Forest Red-tailed Black Cockatoo (FRTBC) (*Calyptorhynchus banksii* subsp. *naso*) (FRTBC) (Vulnerable) and Western Ringtail Possum (*Pseudocheirus occidentalis*) (WRP) (Critically Endangered). Quenda (*Isoodon obesulus* subsp. *fusciventer*) (Priority 4), Peregrine Falcon (*Falco peregrinus*) (Other Specially Protected) and South-western Brush-tailed Phascogale (*Phascogale tapoatafa* subsp. *wambenger*) (Conservation Dependent) have the potential to occur within the Survey Area, along with Baudin's cockatoo (*Zanda baudinii*) (Endangered) and Carnaby's cockatoo (*Zanda latirostris*) (Endangered). Black cockatoo taxa are likely to utilise the site for foraging, however no (likely) breeding hollows or roosts were recorded.

Three known black cockatoo breeding records occur within 12 km, with the nearest 1.3 km away. There were 203 trees of suitable DBH within the Survey Area, five of which contained hollows. One hollow in tree ID 188, located approximately seven metres from the road seal, was technically of suitable size for black cockatoos, however considered unlikely to be used due to its low height and the narrow and marginal internal dimensions. All six hollow bearing trees present within the Survey Area may still be utilised by other target fauna (WRP).

There were no Baudin's cockatoo, Carnaby's cockatoo, Quenda, Peregrine Falcon or South-western Brush-tailed Phascogale recorded within the Survey Area. WRP were observed from the two habitat types in the west of the Survey Area.

The following recommendations should be considered:

- Once the final impact area (proposed action) is known, the proposal should be assessed against the DAWE (2022) Foraging quality scoring tool (template in Table 2-5, Section 2.2.2 of this report).
- Proposed impacts to WRP and their habitat should be assessed against the Commonwealth Matters of National Environmental Significance – *Significant impact guidelines 1.1* (DEWHA, 2009).
- Clearing of native vegetation should be minimised.
- Clearing schedules should be planned to avoid spring breeding peaks.
- An authorised fauna spotter should be present during clearing of hollow bearing trees and Habitat Types 1 – 3 to manage hollow dependant fauna and WRP.
- Weed management and infill planting could be considered in adjacent degraded areas.
- Artificial hollow installation should be considered if the existing hollows are to be cleared.

1 Introduction

1.1 Project Overview

The Shire of Capel (herein referred to as 'the Shire') is proposing to undertake maintenance and minor road widening between 0.00 and 12.00 straight line kilometres (SLK) on Gavins Road (approximately 12 km in length), between Capel-Boyanup Road and Boundary Road, Capel (Figure A.1, Appendix A). The Survey area includes 26.15 hectares (ha). The Survey Area occurs within the local government authority (LGA) boundary of the Shire of Capel, 1.4 km northeast of the township of Capel. SW Environmental were engaged to conduct Basic and Targeted fauna surveys to inform clearing approvals required by the Shire.

1.2 Survey Area

The Survey area includes 26.15 ha of road and verge on both sides of the road between 0.00 and 12.00 SLK, Gavins Road. Approximately 7.19 ha of the verge contains native vegetation. The Desktop Survey Area (DSA) consisted of the Survey Area with a 10 km buffer. The DSA was utilised to compile relevant information to inform the desktop assessment, field survey and subsequent reporting. Figure A.1 (Appendix A) presents the Survey Area location and Figure A.2 (Appendix A) presents the Survey Area and DSA.

1.3 Scope of Work

SW Environmental was commissioned to carry out a Basic[1] survey, comprising of a basic terrestrial fauna species inventory, habitat assessment, likelihood of occurrence assessment for conservation significant fauna, along with a Targeted Black Cockatoo and Western Ringtail Possum (*Pseudocheirus occidentalis*) (WRP) (Critically Endangered) Survey. The Targeted Black Cockatoo Survey component was required to identify black cockatoo[2] habitat values, including potential and actual breeding habitat, foraging habitat and roost sites. The WRP Survey investigated habitat values, identifying the presence or absence of WRP scat, dreys and hollows.

[1] Environmental Protection Authority 2020, Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment, EPA, Western Australia.

[2] Black cockatoos collectively refer to

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii subsp. naso*) (Vulnerable)
- Baudin's cockatoo (*Zanda baudinii*) (Endangered)
- Carnaby's cockatoo (*Zanda latirostris*) (Endangered)

The fauna survey was restricted to terrestrial vertebrate fauna. Threatened aquatic fauna and invertebrates were considered through desktop assessment only.

The survey is in accordance with EPA Technical Guidance (EPA, 2020) and other relevant State and Commonwealth guidelines and includes:

- Desktop study,
- Field survey - validation of the desktop study and habitat assessment,
- Consultation, reporting, mapping, and recommendations.

1.4 Regulatory Context

1.4.1 Key Legislation

Fauna in WA may be afforded protection under the WA BC Act and/or federal EPBC Act. Species listed as threatened or migratory under the above legislation are referred to collectively as 'conservation significant' or 'target' species. These terms include species listed under the DBCA Priority lists refer to Appendix B for further detail and conservation code descriptions.

Key environmental legislation that may be relevant to the fauna survey is outlined in Table 1-1.

Table 1-1 Environmental legislation that may be relevant to the Project

Legislation	Responsible Government Department	Aspect
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Federal Department of Climate Change, Energy, the Environment and Water (DCCEEW)	Matters of National Environmental Significance including threatened fauna and environmental offsets.
Biodiversity Conservation Act 2016 (BC Act)	WA Department of Biodiversity, Conservation and Attractions (DBCA)	Threatened species habitats, threatening processes, environmental pests and weeds.
Environmental Protection Act 1986 (EP Act)	Environmental Protection Authority or DWER	Environmental impact assessment and management and offsets.

1.4.2 Guidelines

Black cockatoo habitat is typically assessed by considering breeding, roosting and foraging habitat. The black cockatoo and WRP survey methodologies were developed with consideration of:

- Commonwealth Matters of National Environmental Significance – *Significant impact guidelines 1.1 Environmental Protection and Biodiversity Conservation Act 1999*, Department of the Environment, Water, Heritage and the Arts (2009).
- Commonwealth *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).

- Commonwealth *EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered), Zanda latirostris, Baudin's cockatoo (vulnerable), Zanda baudinii, and Forest red-tailed black cockatoo (vulnerable) Calyptorhynchus banksii naso* (SEWPaC, 2012)
- Department of Parks and Wildlife (2013). Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan. Department of Parks and Wildlife, Perth, Western Australia.
- Department of Environment and Conservation (2008) Forest Black Cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*) Recovery Plan
- Department of Parks and Wildlife (2017). Western Ringtail Possum (*Pseudocheirus occidentalis*) Recovery Plan. Wildlife Management Program No. 58. Department of Parks and Wildlife, Perth, WA.
- Environmental Protection Authority (2002). Terrestrial Biological Surveys as an Element of Biodiversity Protection. Position Statement No. 3.
- Environmental Protection Authority (2020). Technical Guidance – Terrestrial Guidance for Fauna Surveys for Environmental Impact Assessment. Perth, Western Australia.

1.4.3 EPBC Act Considerations

The Commonwealth of Australia (DAWE, 2022) guideline applies to the three black cockatoo species listed as threatened species under the EPBC Act. The guideline provides guidance on what actions are likely or unlikely to require referral to the Minister for the Environment regarding significant impact on black cockatoos (SEWPaC, 2012):

- Currently, the overall population trend for all three black cockatoo species is declining and is expected to continue to decline.
- The loss of breeding habitat is likely to require a referral.
- The loss of one or more known or suitable nesting trees is likely to require a referral.
- The loss of a known night roosting site is likely to require a referral.
- The loss of equal to or greater than one ha of high-quality foraging habitat is likely to require a referral (as determined using the foraging quality scoring tool in Table 2-5, Section 2.2.2).
- The loss of one or more hectares of predominantly exotic habitat (e.g. pines) known to be utilised by black cockatoos is likely to require a referral.
- The loss of under 10 ha of low-quality foraging habitat is unlikely to require a referral (as determined using the foraging quality scoring tool in Table 2-5, Section 2.2.2).
- Light pruning or trimming of a night roosting site is unlikely to require a referral.

Once the final impact area (proposed action) is known, the proposal should be assessed against the DAWE (2022) Foraging quality scoring tool (template in Table 2-5, Section 2.2.2 of this report). The

scoring tool includes consideration of the three components used in the EPBC Act Offsets Assessment Guide (SEWPaC, 2012) in the calculation of habitat quality (site condition, site context and species stocking rate) by considering contextual factors relating to habitat quality to give a final habitat quality score.

Proposed impacts to WRP and their habitat should be assessed against the Commonwealth Matters of National Environmental Significance – *Significant impact guidelines 1.1* (DEWHA, 2009).

2 Methods

2.1 Desktop Review

A desktop study of fauna within and near the Survey Area (within the DSA) was undertaken to determine the likelihood of any species of conservation significance (target species) occurring within the Survey Area. A species list including common (non-target) species was prepared for the DSA (10 km) (Appendix C.1) based on:

- Atlas of Living Australia (ALA, 2025),
- Birdata (BirdLife Australia, 2025),
- Dandjoo (DBCA, 2024a)
- Protected Matters Database (DCCEEW, 2024), and
- Department of Biodiversity, Conservation and Attraction's Threatened, Specially Protected and Priority Fauna Database and black cockatoo breeding and roosting records (DBCA, 2024b).

Data from the Government of WA's Shared Land Information Platform (SLIP) (Landgate, 2024) was queried, along with relevant management plans, recovery plans, books, scientific journals and other publications, previous survey reports (Index of Biodiversity Surveys for Assessments (DWER, 2024)) and expert consultation.

Fauna habitats were derived from flora and vegetation survey mapping undertaken by Ecoedge (2024), and adapted for fauna value context.

A brief review of the ecology, habitat and range of target species were used in an evaluation matrix to determine the likelihood of occurrence of conservation significant fauna (Appendix D). Fauna of conservation significance that may occur locally are listed in Section 3.2.2.

2.2 Field Survey

2.2.1 Survey Area, Timing, and Personnel

Field work consisted of a diurnal site visit on the 14th of January 2025 by SW Environmental Principal, Shane Priddle and Ecologist, Georgia Johnsen, and nocturnal spotlighting undertaken on the 21st and

23rd of January 2025. The surveys were undertaken to validate the desktop study and ground truth fauna habitat. Fauna habitat types were documented based on structural vegetation and soil mapping where significant changes occurred. Fauna habitat quality was based on the criteria in Tables 2-1 to 2-3. Evidence of fauna (e.g. scat searches, diggings or feed residue), and sightings were noted. Targeted black cockatoo searches were carried out in line with the methodology outlined in Section 2.2.2.

Table 2-1 Vegetation structural classes (Keighery, 1994).

Life Form/Height Class	Canopy cover			
	100% to 70%	70%to 30%	30%to 10%	10% to 2%
Trees over 30 m	Tall Closed Forest	Tall Open Forest	Tall Woodland Woodland	Tall Open Woodland
Trees 10-30 m	Closed Forest	Open Forest		Open Woodland
Trees under 10 m	Low erased Forest	Low Open Forest	Low Woodland·	Low Open Woodland
Mallee over 8 m (Tree Mallee)	Closed Tree Mallee	Tree Mallee	Open Tree Mallee	Very Open Tree. Mallee
Mallee under 8 m (Shrub Mallee)	Closed Shrub Mallee	Shrub Mallee	Open Shrub Mallee	Very Open Shrub
Shrubs over 2 m	Closed Tall Scrub	Tall Open Scrub	Tall Shrubland Shrubland	Tall Open Shrubland
Shrubs 1-2 m	Closed Heath	Open Heath	Low Shrubland	Open Shrubland
Shrubs under 1 m	Closed Low Heath	Open Low Heath		Very Open Shrubland
Grasses	Closed Grassland	Grassland	Open Grassland	Very Open Grassland
Herbs	Closed Herbland	Herbland	Open Herbland	Very Open Herbland
Sedges	Closed Sedgeland	Sedgeland·	Open Sedgeland.	Very Open Sedgeland

Table 2-2 Vegetation condition scale (EPA, 2016).

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.

Completely Degraded	The structure of the vegetation is no longer intact, and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees and shrubs.

Table 2-3 Fauna habitat quality categories and descriptions (SW Environmental, undated).

Quality	Description
Good	• Native vegetation with intact and diverse habitat structure. Different vegetation age classes present at most stratum levels (ground, understorey, midstory, canopy). • Forest/woodland: abundant hollow-bearing trees, including those with or likely to develop large hollows. Mature trees offer more foraging resources (nectar/seed). • Presence of shelter/refuges at ground level (dense understorey plants, tussock, rocky outcrop, hollow logs). • High habitat complexity (ecotones between vegetation types or habitat mosaic). This increases the range of foraging and shelter opportunities within a habitat. • Presence of key foraging and microhabitat components for target species. • Little to no obvious weed invasion or evidence of grazing. • May be large patch and/or connected to other areas of native vegetation.
Moderate	• Native flora species dominant with moderate habitat structure complexity appropriate to vegetation type. Ground litter intact or slightly disturbed. More than one age class present. • Forest/woodland: low to moderate abundance of hollow-bearing trees or trees likely to develop hollows. • Some shelter and refuge present for ground dwelling fauna. • Some habitat complexity (ecotones between vegetation types or areas forming a habitat mosaic). • Marginal presence of key microhabitat components for target species. • May be small or large in scale, and isolated or well connected.
Poor	• Habitat highly disturbed and simplified with low structural complexity. Ground litter layer absent or highly modified. Complexity reduced by only one age class present. • Little or no shelter and refuge for ground dwelling fauna. • Forest/woodland: not likely to support hollow-bearing trees. • Lack of key foraging and microhabitat components for target species. • May have evidence of weed invasion or grazing. • May be narrow or small area and substantially influenced by edge effects, isolated from other areas of native vegetation.

2.2.2 Black Cockatoo Survey Methodology

Black cockatoo surveys (habitat assessment and tree surveys) were conducted during the diurnal survey. The field survey methodology was based on the Commonwealth referral guidelines for black cockatoos (DAWE, 2022; SEWPaC, 2012) and black cockatoo species profiles in the Desktop review (Section 3.3). The profiles are based on literature review and previous work and consultation with Tony Kirby, a recognised black cockatoo expert. Black cockatoo habitat surveys included an assessment of suitable DBH trees, tree hollow assessment, foraging habitat assessment, and roosting habitat.

Twelve km is referenced as a nominal distance for site context and local vegetation and habitat values and is considered the maximum range that black cockatoos travel from a nesting site to forage (DAWE, 2022).

Suitable DBH tree and hollow survey

Black cockatoos' nest in hollows formed in large, native eucalypt trees, assessed as potential habitat or "Suitable DBH trees". Suitable DBH tree refers to a suitable Diameter at Breast Height measurement. In the Southwest, black cockatoos normally breed in *Corymbia calophylla* (Marri), *Eucalyptus gomphocephala* (Tuart) or Karri (*Eucalyptus diversicolor*). Sometimes *Eucalyptus marginata* (Jarrah), *Eucalyptus rudis* (Flooded gum) or other native trees are used. Tree species are discussed further in Section 3.

Notes on tree records: Trees with a suitable DBH include those with a measurement ≥ 50 cm for most trees in the Southwest, ≥ 30 cm DBH for most Wheatbelt species e.g. *Eucalyptus wandoo* (Wandoo) and *Eucalyptus salmonophloia* (Salmon gum), and ≥75 cm for fast growing trees, such as eastern states eucalypts or Karri (*Eucalyptus diversicolor*).

Mallee form or multi-stemmed trees typically have the largest stem measured. If they are multi-stemmed around head height with under sized DBH on the main trunk, they are not recorded. Planted eastern states eucalypts such as blue gums, e.g. *Eucalyptus saligna* or *Eucalyptus globulus,* are unlikely to develop hollows unless they are at an advanced age (S. Priddle, pers obs.). As such, they are not recorded unless they were visibly senescing or large hollows are observed. Trees laying over or considered to have no potential to develop hollows (burnt or close to falling) are not recorded.

Trees were mapped by GPS (~2 m accuracy), with notes made on tree species and DBH size class. A ground-based assessment of each tree was made using binoculars. The black cockatoo breeding suitability of a hollow was assessed based on an assessment of attributes such as hollow angle, access, entry (aperture) size, estimate of chamber size, and use by other animals. European honeybee (*Apis mellifera*) hives may render a hollow unsuitable for the short term, so bees were noted. Hollows that were potentially suitable or likely to provide breeding habitat were further assessed by drone or pole camera. Records *confirmed* or *not confirmed* indicate whether pole cam or drone inspection was conducted. Pole camera and/or use of drones was conducted in line with animal ethics and license requirements.

The number of hollows (limited to the most suitable hollows), aperture size, angle, height, breeding suitability, evidence of use was recorded. Assessment criteria are provided in Table 2-4.

Table 2-4 Suitable DBH tree and hollow classes and descriptions

Class	Description
Tree with suitable DBH without hollows	Suitable DBH tree (described above) that do not have hollows or hollows are too small for black cockatoo entry (<10 cm aperture).
Tree with suitable DBH with unsuitable hollow	Suitable DBH tree with a hollow with multiple attributes that would make the hollow unlikely to be suitable for breeding such as unsuitable entry aperture, internal dimensions, height or angle. Unlikely to be used by black cockatoos in current form.
Tree with potentially suitable size hollow with no signs of use	Suitable DBH tree that may have a suitable hollow but with a single attribute that might reduce the suitability of the hollow for breeding, such as the marginal entry aperture size, coned out internal dimensions, low height or oblique angle. The hollow has no evidence of use (chew marks, scarring, eggs, woodchips, etc). Possible but unlikely to be used by black cockatoos in current form.
Tree with suitable size hollow with no signs of use	Suitable DBH tree with a hollow with suitable attributes for breeding (suitable entry size, internal dimensions, height and angle). The hollow has no evidence of use (chew marks, scarring, eggs, woodchips) and whilst not currently used could be used in future.
Tree with potentially suitable size hollow with signs of use	Suitable DBH tree that may have a suitable hollow but with a single attribute that might reduce the suitability of the hollow for breeding, such as marginal entry aperture size, coned out internal dimensions, low height or oblique angle. The hollow has evidence of use (chew marks, scarring, eggs, woodchips). The evidence may be caused by other species, but black cockatoo use could not be ruled out without further survey.
Tree with suitable size hollow with signs of use	Suitable DBH tree with a hollow with suitable attributes for breeding (suitable entry size, internal dimensions, height and angle). The hollow has evidence of use (chew marks, scarring, eggs, woodchips) consistent with black cockatoo use, previous or current. The evidence may be caused by other species, but use of the hollow by black cockatoo is considered likely.
Known nesting tree	Suitable DBH tree with a known nesting hollow (cockatoos observed using the hollow and assumed to be breeding) or previously recorded as a breeding tree.

Foraging habitat assessment

The quality of potential black cockatoo foraging habitat was described based on structural vegetation mapping, with presence or absence of key feed species. Key feed species are defined in the species' profiles in Section 3 and from the plant list classified as primary or secondary foraging plants as assessed in Appendix E. Foraging habitat scores should be used as a high-level guide and be used with consideration of site context, timing and other factors. For example,

- lower quality foraging habitat may be important during breeding periods if it is located near breeding habitat (the closer the foraging resource the more important it may be),
- certain feed species may may be used in some regions but not in others due to a preference for other plants that may be available – the same feed species in the Jarrah Forest may not be used as heavily on the Swan Coastal Plain,
- as primary feed plants may flower or fruit at certain times, secondary plants may become as important as the primary plants when the primary plants resources are not available.

Vegetation, mapping compiled by Ecoedge (2024) was ground-truthed and adapted for use as a basis for black cockatoo foraging habitat quality. Feed residue was noted if observed. Foraging categories were assigned to the fauna habitats in line with Table 2-5) for each black cockatoo species.

Table 2-5 Foraging habitat category and description as a high-level guide and to be used with consideration of site context, timing and other factors

Category	Description
No foraging habitat	Cleared areas, dead trees, or plant species that are not known to be frequently fed on.
Low quality foraging habitat	Low quality foraging habitat may include one or more of the following • primary feed species that are isolated or disease affected, • some secondary foraging habitat such as trees that are not frequently fed on or are not considered a sustaining resource, • no evidence of foraging, • vegetation in a Completely Degraded or Degraded condition or relatively small areas relative to other higher quality surrounding habitat. Examples include dieback (e.g. *Phytophthora* spp.) affected Jarrah or *Banksia* or severe canker (*Quambalaria coyrecup*) affected Marri or very sparse primary or secondary feed species.
Moderate quality foraging habitat	Moderate quality foraging habitat may include one or more of the following • primary feed species (e.g., *Hakea*, Jarrah, Marri or pine trees) present but patchy or as paddock trees, • habitat dominated by a number of secondary feed species - vegetation communities with very few primary feed species present, • no evidence of recent foraging or some evidence in small amounts, • not near (within 6 km) breeding hollows (known or likely), • native vegetation where few primary or secondary feed species are present in Degraded or Good condition (EPA, 2016).
High quality foraging habitat	High quality foraging habitat may include one or more of the following depending on the site context and surrounding habitat • primary feed species (e.g. *Hakea*, Jarrah, Marri or pine trees) dominant as paddock trees, patches, or components of a larger patch, • within 6 km breeding hollows (known or likely), • evidence of recent foraging, • native vegetation in Good or better condition (EPA, 2016).

Roosting habitat survey

Roosting cockatoos would have been observed during the diurnal (secondary evidence) and nocturnal surveys (direct observations). Direct and indirect evidence of black cockatoo roosting within trees on site was noted if observed. Secondary evidence was also noted, such as the presence of moulted or preened feathers or down, clipped branches and whitewash.

2.2.3 Western Ringtail Possum Survey Methodology

WRP targeted surveys included diurnal and nocturnal surveys. The diurnal survey on the 14th of January 2025 included general habitat assessment and WRP scat searches broadly across the survey area at the base of trees, on fallen timber and bare ground. The presence or absence of dreys and hollows was noted. Photos were taken within all habitat types.

Nocturnal spotlight surveys were conducted on the 21st and 23rd of January 2025 to survey the distribution and abundance of WRP within the Survey Area (survey effort shown in Appendix A, ,Figure A.5). Animals just outside of the Survey Area were also recorded. Surveys were conducted by two experienced surveyors by foot using 1000 lumen LED head torches, over the entire Survey Area. Weather

conditions were conducive for spotlighting. Common brushtail possum (CBP) (*Trichosurus vulpecula*) and South-western Brush-tailed Phascogale (*Phascogale tapoatafa* subsp. *wambenger*) (Conservation Dependent) were also recorded.

2.3 Survey References

Publications

Publications consulted for general distribution of fauna included, but were not limited to:

- A Complete Guide to Reptiles of Australia (Wilson & Swan, 2021)
- A Field Guide to the Mammals of Australia (Menkhorst & Knight, 2010)
- Field guide to frogs of Western Australia (Tyler & Doughty, 2009)
- Frogs of Western Australia (Johnstone & Storr, 1998)
- Handbook Western Australian Birds Vol I (Johnstone & Storr, 1998)
- Michael Morcombe's Birds of Australia eGuide, (Morcombe, 2011)
- Reptiles and Frogs in the Bush: Southwestern Australia (Bush et al., 2007)
- Scats, Tracks and Other Traces: A field guide to Australian mammals (Triggs, 2004)
- The Field Guide to the Birds of Australia (Pizzey & Knight, 2012)
- Waterbirds of South-West Wetlands (Thomson-Dans & Halse, 2001)
- Numerous online publications, journal articles and other general species references (see References section).

Local Technical Surveys

Technical fauna surveys relevant to the project in a regional habitat context include

- Biota (2020). *Regional Population Assessment of the Western Ringtail Possum.* Unpublished report for Main Roads Western Australia.
- Ecoedge. (2024). *Targeted and Detailed Flora and Vegetation Survey Gavins Road (SLK 0.0 to 11.06)*, Capel (Unpublished report prepared for SW Environmental, May 2024).

Taxonomy and Nomenclature

The taxonomy and nomenclature used in this report follows several sources, depending on the faunal group. It primarily follows Naturemap (2024) but also the following:

- Amphibians: Bush et al. (2007)
- Aves: Pizzey and Knight (2012)
- Mammals: Menkhorst and Knight (2010)
- Reptiles: Wilson and Swan (2021)

2.4 Animal Ethics

The survey conformed to Section 4 of the *Australian code of practice for the care and use of animals for scientific purposes* (National Health and Medical Research Council, 2004). No animals were captured or collected during the survey. Surveys were also carried out under Scientific Use License *Animal Welfare Act 2002* Licence to use animals for scientific purposes: Licence No: U285/ 2022-2024 and Wildlife Animal Ethics Committee (WAEC) Permit: WAEC 22-08-88. No nesting black cockatoos were directly disturbed during this survey.

2.5 Limitations

In accordance with relevant *Technical Guidance* (EPA 2020) survey limitations are shown below.

Table 2-6 Assessment of survey limitations

Aspect	Constraint	Comment
Competency / experience	No	Shane Priddle (Ba Science; Certified Environmental Practitioner No.310) led the surveys and has nearly 25 years' experience surveying black cockatoo and WRP throughout NSW and WA.
Scope	No	The survey scope is adequate to inform environmental assessment in relation to fauna, including black cockatoos and WRP.
Adequacy of the survey intensity and proportion of survey achieved	No	The survey effort applied was adequate to identify fauna habitat values. A precautionary approach has been adopted.
The proportion of the task achieved and further work	No	The surveys were completed adequately, to a sufficient level with respect to the scope.
Timing/weather/season	No	The surveys were completed in suitable weather conditions in summer 2025.
Disturbances	No	There were no disturbances that affected the survey.
Intensity	No	The survey effort was adequate to meet the project scope.
Completeness	Negligible	The entire Survey Area was assessed.
Resources	No	The surveys were completed adequately.
Access problems	No	The site was within public land and was accessible.
Identification of hollows	Low	Known limitations inherent in the survey of hollows include bias with surveyors, times, differing familiarity with tree types, levels of expertise, survey conditions such as weather and time of day, and survey technique (Gorrod & Keith, 2008; Rayner et al., 2011) Ground counts of hollows are subjective. Some hollows may be missed, obscured, particularly hollows in branches and vertical hollows. As well as providing inaccurate counts of hollow abundance, ground surveys provide incomplete or inaccurate information on hollow dimensions and use of hollows by fauna (Koch, 2008). Generally, ground-based surveys lead to overestimation of hollows (Rayner et al. 2011, S. Priddle pers obs.). This limitation was reduced by checking hollows with a pole camera or drone for suitability where required. Hollow characteristics may change over time. There is some risk, although low, that black cockatoos may breed in a hollow where evidence of use is not visible or hollow characteristics are atypical. Not all active cockatoo

Aspect	Constraint	Comment
		hollows show signs of heavy chewing, and active or past breeding hollows may be missed. Also, other animals such as Little corella (*Cacatua sanguinea*) or Galah (*Eolophus roseicapilla*) may use black cockatoo hollows at other times of the year or between years. The author has extensive experience in the identification and assessment of hollows and is considered competent in relation to this skill. The results are provided based on experience and professional judgement though certainty of use cannot be guaranteed without hollow watching during the breeding season.

3 Desktop Review

3.1 Local and Regional Context

3.1.1 Current Land Use and Site Values

The Survey Area consists of road reserve including cleared areas and pockets of remnant vegetation or paddock trees. Crown Reserve (3249) abuts the Survey Area for 185 m at the northwest end of the project. Land surrounding the survey area consists predominantly of cleared agricultural and rural areas, with larger pockets or strips of remnant vegetation. Vegetation Condition across the survey area ranged from Excellent to Completely Degraded, with most native vegetation existing in Degraded or Completely Degraded condition. Completely cleared areas or paved roads covered 18.73 ha of the site. Most of the existing vegetation had been subject to disturbances such as edge effects with weed invasion.

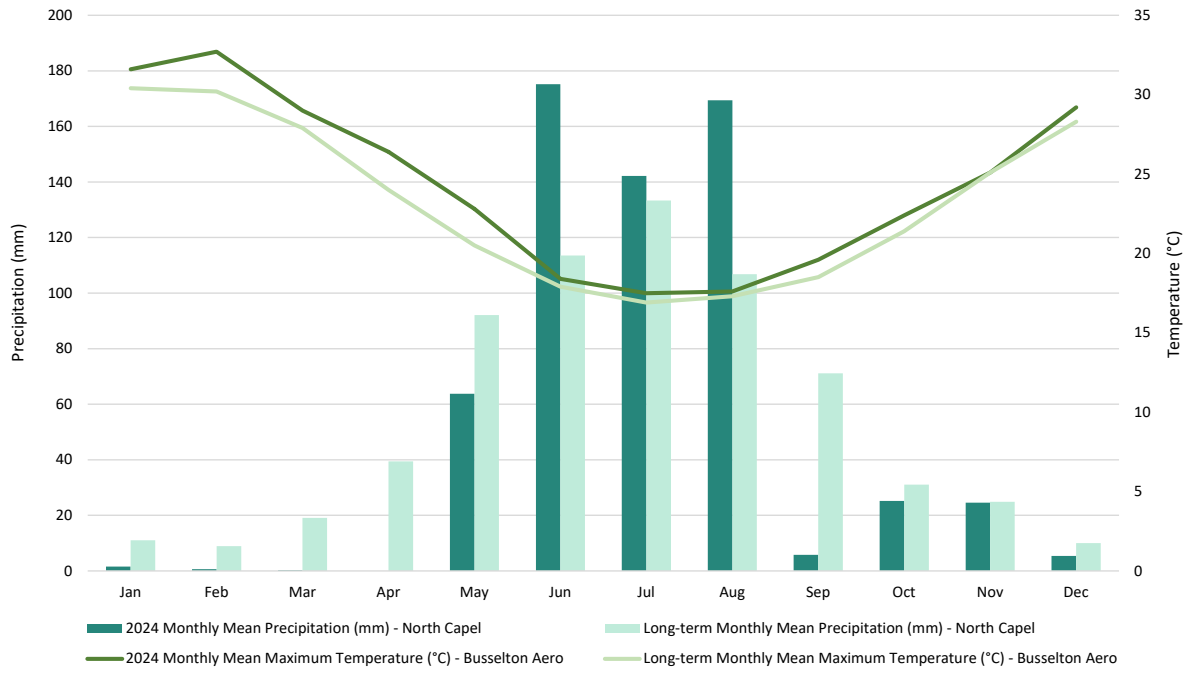
3.1.2 Interim Biogeographic Regionalisation of Australia (IBRA) and climate

The Survey Area is located within the Swan Coastal Plain Interim Biogeographic Regionalisation for Australia (IBRA) bioregion, specifically within the Perth (SWA02) IBRA subregion (DCCEEW, 2022, 2023). The SWA02 IBRA subregion is typically of a warm, Mediterranean climate, experiencing an average annual rainfall of 600 to 1,000 millimeters (mm) (Mitchell et al., 2002).

Graph 3-1 presents climatic information for the 12 months preceding the survey, along with long-term climate data at the most relevant Bureau of Meteorology climate stations (BoM, 2025). The Capel North climate station (number 9992) contained the most comprehensive rainfall data to the Survey Area. In the absence of temperature data at the Capel North climate station, data from Busselton Aero (station number 9603, situated 19.8 km from Capel) was analysed (BoM, 2025).

Long-term mean maximum temperatures range from 30.4°C in the hottest month of January, to 16.9°C in the coolest month of July. Temperatures exceeded the long-term average over the 12 months preceding the survey. (Graph 3-1).

The long-term average annual rainfall is 661.2 mm. Annual precipitation recorded in 2024 was recorded at 614 mm, a measurement ~47 mm below average (BoM, 2025). Precipitation in 2024 was notably below average during the months March – May (with a difference ranging from ~19 –28 mm). Contrarily, 2024 precipitation exceeded long-term averages by more than 60 mm in months June, August and September (Graph 3-1).



Graph 3-1 Temperature and rainfall data from the Capel North and Busselton Aero bureau weather stations (BoM, 2025)

3.1.3 Landforms and Soils

The SWA02 IBRA subregion is composed of colluvial and aeolian sands, alluvial river flats and coastal limestone (Mitchell et al., 2002). Soils within the Survey Area are situated on the Pinjarra and Bassendean soil landscape zones (DPIRD, 2022a). The Pinjarra zone is associated with alluvial deposits between the Bassendean Dunes Zone and Darling Scarp and colluvial and shelf deposits adjacent to the Darling Scarp. The zone consists of clayey to sandy alluvial soils with wet areas. The Bassendean zone comprises fixed dune systems inland from the coastal dune zone. The zone consists of non-calcareous sands and podsolised soils with low-lying wet areas.

Soil landscape mapping by the Department of Agriculture (now the Department of Primary Industries and Regional Development (DPIRD)), has been prepared across the southwest of WA as a compilation of a variety of soil and soil-landscape survey results (DPIRD, 2022b). Soils within the Survey Area occur across 13 landscape subsystems, as presented in Table 3-1.

Table 3-1 Soil landscape systems intersecting the Survey Area (Schoknecht et al., 2004)

System	Subsystem	Description
Bassendean System (213_Bs)	212Bs_B1	Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m; banksia dominant.
	212Bs_B1a	Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands with an

		intensely coloured yellow B horizon occurring within 1 m of the surface; marri and jarrah dominant.
	212Bs_B3	Closed depressions and poorly defined stream channels with moderately deep, poorly to very poorly drained bleached sands with an iron-organic pan, or clay subsoil. Surfaces are dark grey sand or sandy loam.
	212Bs_B6	Sandplain and broad extremely low rises with imperfectly drained deep or very deep grey siliceous sands.
Pinjarra System (213_Pj)	213Pj_B1a	Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands with an intensely coloured yellow B horizon occurring within 1 m of the surface; marri and jarrah dominant.
	213Pj_B2	Flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan 1-2 m.
	213Pj_B6	Sandplain and broad extremely low rises with imperfectly drained deep or very deep grey siliceous sands.
	213Pj_P1a	Flat to very gently undulating plain with deep acidic mottled yellow duplex (or effective duplex) soils. Shallow pale sand to sandy loam over clay; imperfect to poorly drained and generally not susceptible to salinity.
	213Pj_P1b	Flat to very gently undulating plain with deep acidic mottled yellow duplex (or ¿effective duplex¿) soils. Moderately deep pale sand to loamy sand over clay: imperfectly drained and moderately susceptible to salinity in limited areas.
	213Pj_P7	Seasonally inundated swamps and depressions with very poorly drained variable acidic mottled yellow and gley sandy duplex and effective duplex soils.
	213Pj_P7b	Seasonally inundated swamps and depressions or seepage areas near the base of the foothills with very poorly drained deep bleached siliceous sands.
	213Pj_P8	Broad poorly drained flats and poorly defined stream channels with moderately deep to deep sands over mottled clays; acidic or less commonly alkaline gley and yellow duplex soils to uniform bleached or pale brown sands over clay.
	213PjW_SWAMP	Swamp. Wet soils, water.

3.1.4 Wetlands and Watercourses

The Geomorphic Wetlands of the Swan Coastal Plain dataset (DBCA, 2024c) indicates that the Survey Area occurs on predominantly palusplain wetlands (seasonally waterlogged flats), with a limited area of dampland (seasonally waterlogged basin) (0.30 ha) and two areas of sumpland (seasonally inundated basins) (1.9 ha total), occurring within the western and eastern extents respectively. The status of the palusplain and sumpland wetlands are within the management category of 'Multiple Use', scoring poorly on both natural and human use attributes and subsequently earmarked for use, development and management in the context of water, town and environmental planning. The dampland wetland area is categorised as 'Resource Enhancement', being a wetland with moderate natural and human use

attributes that can be restored or enhanced. This management category contains the objective to restore wetlands through maintenance and enhancement of functions and attributes (EPA, 2008).

Two non-perennial watercourses intersect the Survey Area, of which both are connected to the Gyndup Brook that exists north of the Survey Area. Intersecting watercourses include a canal line that passes through the Survey Area at ~7.4 SLK, and a minor watercourse that crosses the western end of the Survey Area (Crossman & Li, 2015).

3.1.5 Local Habitat Remaining

In a local context, the Swan Coastal Plain has historically been heavily over-cleared. Within 5 and 12 km of the Survey Area (similar to the extent typically travelled by breeding black cockatoos), native vegetation remaining, along with DBCA-managed reserve areas are presented in Table 3-2.

The area of native vegetation remaining within five km of the Survey Area is poorly represented at less than 30 % of the total area. The area remaining within 10 km is only slightly higher, at 34 %. Of the 14 % and 23 % of land reserved by the State within five km and 10 km of the site (respectively), the majority of reserved land is associated with the Boyanup State Forest (Landgate, 2024). Crown Reserve (3249) abuts the Survey Area for 185 m at the northwest end of the project, being the closest area of State reserved land to the site.

Table 3-2 Areas of DBCA reserves and native vegetation remaining within the foraging distances (6-12 km) from the survey area (Landgate, 2024)

Foraging range	Total area (ha)	Reserved (DBCA) %, Area (ha)	Native vegetation (including regrowth) remaining % of total area, Area (ha)
5 km	19,929	14 % (2,835 ha)	26 % (5,088 ha)
10 km	55,582	23 % (13,039 ha)	34 % (18,805 ha)

3.1.6 Habitat Connectivity

The South West Regional Ecological Linkages (SWREL) project (Molloy et al., 2009) identifies regional scale ecological linkages and aims to respond to the issues of fragmentation and climate change through land use planning policy and procedures. It also seeks to retain native vegetation and fauna habitat and reduce the loss of biodiversity and ecological function in the southwest.

The SWREL axis lines can be summarised as a series of vegetation patches which, due to their proximity, act as habitat stepping stones, thereby facilitating ecological processes and movement of organisms within and across the landscape (i.e. at the landscape scale).

The capacity for fauna to move is generally related to size; the larger the animal generally the greater the ability for the animal to cover a greater area (Molloy et al., 2009). Studies referred to in the SWREL Technical Report generally indicate (simplified) that

- Small mammals may cross widths of up to 100 m while dispersing,
- Small insectivorous passerines may cross gaps up to 20 m but not over 80 m,
- Arthropods and small lizards are generally sedentary in nature and unlikely to move between patches,

- Small invertebrates (as pollinators) will generally not disperse over 100 m,
- Frogs will generally disperse over 150m.

The above indicates that while vegetation gaps will, to some degree, compromise the capacity of fauna to persist, gaps of <100 m will not bring about a significant barrier to the dispersal of many fauna species. A gap of 1000 m between patches of remnant vegetation is recognised as a major barrier to the movement of many fauna species and represents a threshold, of which once crossed, presents a major decline in biotic interaction. The western extent of the Survey Area is approximately 100 m from the nearest axis line, with existing connectivity declining further eastward along the Survey Area.

3.2 Fauna Records

3.2.1 Fauna Recorded Locally

Desktop searches for fauna that may occur or have been recorded within Survey Area (10 km) yielded 211 vertebrate terrestrial fauna species (Appendix C.1):

- 10 amphibians,
- 163 birds,
- 17 mammals,
- 21 reptiles,

Seven of the listed fauna are introduced or naturalised species. Invertebrates and aquatic species were excluded from the above summary. Freshwater aquatic and some wetland taxa are/may be relevant based on the presence of potential watercourses intersecting the Survey Area, as per desktop results discussed in Section 3.1.4. Freshwater aquatic taxa returned within desktop searches included two fish, one bivalve, one crayfish and one lamprey. Multiple coastal shorebirds and marine migratory species (such as the Hooded Plover, Crested Tern and Albatrosses) were excluded, given that the Survey Area occurred in an inland, in a terrestrial setting.

3.2.2 Fauna of Conservation Significance

Seventeen relevant conservation significant terrestrial vertebrate fauna taxa were returned from desktop database searches, consisting of nine birds and eight mammals (Appendices C, D). This count excluded some taxa that were not relevant to the proposal or would not be impacted, as caveated in Appendix D. Additionally, two freshwater fish, a pouched lamprey, mussel, crayfish, two arachnids and one insect were also returned.

3.3 Black Cockatoos

3.3.1 Profiles

The Survey Area falls within the Region 1 Swan Coastal Plain (DAWE, 2022), characterised by the dominant presence of *Banksia* spp. and Tuart woodlands, as well as Marri, with Jarrah in the east. Black cockatoos utilise Region 1 primarily for foraging resources, with some small patches of breeding habitat existing (DAWE, 2022). There are scattered records for all three black cockatoo species locally (ALA, 2025; BirdLife Australia, 2025; DBCA, 2024b). Species profiles are provided below for further context.

Baudin's cockatoo (*Zanda baudinii*)
EN (EPBC Act), EN (BC Act)

Baudin's cockatoo is a large forest cockatoo endemic to the southwest of WA. Depending on the region of origin, Baudin's cockatoo is a resident, a post nuptial nomad or migrant, with the bulk of the population vacating the coldest parts of their range (the Karri Forest) in the autumn and migrating northwards during the non-breeding season. Small numbers also appear resident in a few places including Leeuwin – Naturaliste Ridge and Manjimup (Johnstone & Kirkby, 2008). Flock sizes vary from small family groups to large aggregations at roosting sites.

Breeding mainly takes place in forested areas from August to November (egg laying dates) (Tony Kirkby, pers comm.) (DAWE, 2022). Baudin's cockatoo breeds in remnant woodland or forest, but may also breed in partially cleared areas, including isolated trees. Nests are in hollows in live or dead trees particularly Karri, Marri, Jarrah, Wandoo, Bullich and Tuart (DAWE, 2022).

In the non-breeding season, Baudin's cockatoo is mainly an inhabitant of Jarrah Marri Forest but also farmland and orchards. Its main food is Marri from which it takes seeds, flowers, grubs, and nectar. Its long bill is adapted to removing seeds from Marri nuts. It feeds on a variety of other foods, including nectar and seeds from *Hakea* and *Banksia* spp., rarely Jarrah, the pith of Kangaroo Paw (*Anigozanthos flavidus*), tips of *Pinus* spp.; *Macadamia* spp., almonds and pecans, seeds and fruit of apples and pears (DAWE, 2022). Refer to Appendix E.

Roost sites are usually in or near riparian environments or other permanent water sources in tall trees; any tree may provide roosting habitat, but particularly Jarrah, Flooded Gum, Blackbutt, Tuart and introduced *Eucalyptus* spp. (Blue Gum, Lemon Scented Gum) (DAWE, 2022; Johnstone & Kirkby, 2008).

Carnaby's cockatoo (*Zanda latirostris*)
EN (EPBC Act), EN (BC Act)

Carnaby's cockatoo mainly occurs in or near eucalypt woodlands, especially those dominated by Wandoo or Salmon Gum, and sometimes in forests of Marri, Jarrah, Karri and Tuart. It is a postnuptial nomad, moving west after breeding. Nesting occurs mainly in the Wheatbelt but is increasingly occurring on the west and south coast. This species is currently expanding its breeding range westward and south into the Jarrah Marri Forests of the Darling Scarp and into the Tuart forests of the Swan Coastal Plain along with the Capes Region (S. Priddle pers obs.). This may be due to climate change (Cale, 2003; SPRAT, n.d.; WA Museum, 2010).

Breeding occurs mainly from early July to mid-December normally in remnant woodland or forest, but also in partially cleared areas, including isolated trees. Nests are in hollows in live or dead trees, particularly Salmon Gum, Wandoo, Tuart, Jarrah, Flooded Gum, York Gum, Powderbark, Karri and Marri (DAWE, 2022). Breeding success is largely dependent on suitable feeding habitat near the nest site to provide food necessary for the survival of the chick (Johnstone et al., n.d.).

The species forages in native shrubland, kwongan heathland and woodland dominated by proteaceous plant species, on seeds, flowers and nectar of *Banksia* spp., *Hakea* spp. and *Grevillea* spp., as well as *Callistemon* spp. and Marri, and in eucalypt woodland and forest that contains foraging species, individual trees and small stands of these species. It also feeds on seeds of introduced species including *Pinus* spp., *Erodium* spp., wild radish, canola, almonds, macadamia and pecans; insects and insect larvae; occasionally apples and persimmons; and liquidambar (DAWE, 2022). Refer to Appendix E.

Carnaby's cockatoos roost near riparian environments or other natural or artificial permanent watersources. Any tall trees may provide roosting habitat, but particularly Flat-topped Yate, Salmon Gum, Wandoo, Marri, Karri, Blackbutt, Tuart, introduced *Eucalyptus* spp. and introduced *Pinus* spp. (DAWE, 2022).

Forest Red-tailed Black Cockatoo (FRTBC) (*Calyptorhynchus banksii naso*)
VU (EPBC Act), VU (BC Act)

The FRTBC is a large forest cockatoo, endemic to the Southwest. FRTBC occurs throughout the Jarrah Marri Karri forested areas and more recently on the Swan Coastal Plain. Group sizes vary from small family groups and pairs to larger gatherings at roost sites.

FRTBC generally breed in remnant woodland or forest but may also breed in partially cleared areas, including isolated trees. They nest in hollows in live or dead trees particularly Marri, Karri, Wandoo, Bullich, Blackbutt, Tuart and Jarrah (DAWE, 2022; Johnstone et al., 2013). FRTBC have been recorded breeding in all months, but with peaks in Spring and Autumn following Marri (or Jarrah) fruit flushes. There are also years when very little breeding takes place (Johnstone and Kirkby, unpublished data).

FRTBC diet is mostly (90%) seeds of Jarrah and Marri in woodlands and forest, and in the edges of Karri forests, with the remainder made up of Blackbutt, *E. staeri* (Albany Blackbutt), Bullich, *Hakea* spp, Tuart, Western Sheoak *(Allocasuarina fraseriana)*, Snottygobble (*Persoonia longifolia*) and the non-indigenous Australian native *Melia azederach* (Cape Lilac) (Johnstone & Kirkby, 1999). The species forage on cones, the fruits of Snottygobble and Mountain Marri. On the Swan Coastal Plain, the species often feed on introduced *Corymbia maculata* (Spotted Gum), Cape Lilac, *Eucalyptus caesia*, *E. erythrocorys*, Lemon-scented Gum and Kaffir Plum (DAWE, 2022). Refer to Appendix E.

FRTBC are known to roost within any tall trees that may provide roosting habitat, particularly tall Jarrah, Marri, Blackbutt, Tuart and introduced *Eucalyptus* spp. trees or large trees on the edges of forests (DAWE, 2022).

3.3.2 Breeding Requirements

All three black cockatoos rely on large hollows for breeding which take many years to form. The onset of hollow formation is dependent on damage to the tree, from animals (normally termites) or snapped / dropped branches, then further rotting. Fire does not appear to be a hollow-forming process; it may reduce the quality and number of hollows over time (S. Priddle pers obs.). Young and healthy trees can quickly heal after damage and trees less than 100 years old are unlikely to contain large hollows. For nesting, black cockatoos show a preference for:

- Large senescing trees,
- Hollows not angled more than 45 degrees from vertical,
- Entrances of at least 12 cm but usually much larger (20-40 cm),
- Deep or well-sheltered hollows in main trunks, or large branches which can provide a floor space of at least 30 cm diameter or more.

All three species of black cockatoo are of similar size and utilise similar hollows when breeding. The actual species of tree is likely unimportant. For example, Carnaby's cockatoo nest in Marri trees in the Marri Forest and Wandoo in the Wheatbelt. All three species may use the same individual hollows when not occupied in the breeding season by other black cockatoo species (Kirkby pers comm, 2019). Suitable hollows may also be used interchangeably with other medium sized birds such as corellas, Galah, ducks and owls. Marri and Jarrah trees are considered by Commonwealth of Australia (DAWE, 2022; SEWPaC, 2012) to be large enough to develop hollows once they are >50 cm DBH. Wheatbelt species such as Wandoo and Salmon Gum may develop hollows at 30 cm DBH (DAWE, 2022). Planted eastern states *Eucalyptus* spp. such as blue gums are generally unlikely to develop hollows unless they are at an advanced age (at least 75cm DBH but usually much larger).

Hollows suitable for use by black cockatoos are usually in trees that are at least 100 years old but usually much older. Supporting literature identifies suitable breeding hollows as occurring in

- Trees over 150 years old (Koch, 2008),
- Marri trees aged ~200 years and Jarrah (~300 years), with an average tree being inhabited at ~400 years for Marri and ~500 years for Jarrah (Inions et al., 1989),
- Marri trees aged between 140 and 410 years of age (Johnstone et al., 2015),
- Jarrah trees aged between 120 and 150 years (Whitford, 2002),
- Marri trees aged at ~450 years, utilised by the medium sized Long-billed Corella (smaller than black cockatoos) (Mawson & Long, 1994), and
- Jarrah trees aged at over 1000 years (as stags) (Wayne, 2005).

While breeding, black cockatoos will generally forage within a 6–12 km radius of their nesting site. Following breeding, birds assemble into flocks and move through the landscape searching for food, usually within six kms of a night roost (SEWPaC, 2012). Black cockatoos rely on access to watering points in selecting night roost sites, with roost sites usually within two kms of a watering point where they often drink in the afternoon following daytime feeding (DAWE, 2022).

3.3.3 Roosting Behaviour

Most roosts are in a large stand of tall trees, with a dense canopy and close to permanent water. Roosting trees need to be a suitable height, have a leafy canopy to shield the birds and help retain body heat. Smaller roost sites up to eight km away from the main roosts are sometimes used, when foraging distances from the main roost become too great (e.g. Carnaby's cockatoo and FRTBC when Jarrah fruit has been exhausted locally) (S. Priddle pers obs., Johnstone et al., 2010).

Baudin's and Carnaby's cockatoos often roost as individuals (about 30 cm or more apart) in the outermost thin branches of the canopy, often among a clump of dense leaves, and generally in positions that are wind affected. FRTBC however roost side-by-side in family groups and on thick, protected perches under the canopy of tall trees (Johnstone et al., n.d.).

3.3.4 Local Context and Records

The Survey Area is located 10 km ENE of the Busselton Wetlands Important Bird Area (IBA), defined as conservation priority by BirdLife International (BirdLife International, 2025b, 2025a). DBCA database records included the following within 12 km of the Survey Area:

- a total of 210 black cockatoo records (20 FRTBC, 64 Baudin's cockatoos, 91 Carnaby's cockatoos and 35 general white-tailed black cockatoo (WTBC) records),
- three natural WTBC breeding hollows recorded within 12 km of the Survey Area, the most recent being two with breeding confirmed in 2019. The closest breeding hollow occurs 1.3 km south of the eastern section of the Survey Area.
- Eighteen roosts were identified over 72 surveys, mostly Baudin's or Carnaby's cockatoos, from Bunbury extending southwards (Table 3-3).

Table 3-3 DBCA roosts within 12 km

Site code	WTBC total count	WTBC max count	FRTBC total count	FRTBC max count	No. of surveys
CAPCAPR001	7	7	0	0	4
CAPGWIR002	123	123	0	0	1
CAPGWIR001	1140	216	0	0	9
DONARGR001	0	0	0	0	3
CAPBOYR001	0	0	47	17	5
CAPCAPR002	95	64	14	8	2
DONDONR001	11	11	20	14	6
BUSCAPR001	0	0	0	0	0

3.4 Western Ringtail Possum

3.4.1 Profile

Western ringtail possum (WRP) (*Pseudocheirus occidentalis*)

CE (EPBC Act), CE (BC Act)

WRP mostly inhabit Peppermint and Peppermint-Tuart associations from Bunbury to Albany but also occur in Jarrah Marri forest in lower densities. The highest densities of WRP occur in the Swan Coastal Plain and South Coast (Biota, 2020; Shedley & Williams, 2014). Peppermint leaves form the basis of the WRP diet in coastal areas, but when unavailable, the dominant myrtaceous species are preferred. In the inland forest, Jarrah and Marri are the main food source. Garden plant varieties are also exploited in urban areas. WRP also feed on new shoots, flowers, leaves and/or fruiting bodies from a range of flora including *Nuytsia floribunda, Acacia saligna, Hardenbergia comptoniana, Allocasuarina fraseriana, E. gomphocephala, E. rudis, Melaleuca viminea, M. cuticularis, M. rhaphiophylla, Kunzea glabrescens* and *Xylomelum occidentale* (Shedley & Williams, 2014).

WRP use a range of nest and shelter sites to avoid predators and exposure to the weather. Dreys are constructed in the canopy if hollows are not available. Adequate nest and shelter sites are necessary components of good quality habitat (Jones et al., 1994; Shedley & Williams, 2014).

Fox predation is one of the main threats and causes of mortality to WRP (Wayne, 2005) along with the loss and fragmentation of native vegetation. This is due to their high dependence on midstorey and overstorey vegetation for food, shelter and protection from predators. In the Jarrah Marri forests, for example around Margaret River, the highest relative abundance occurs in areas with limited anthropogenic disturbance (unlogged or lightly logged, and a low intensity and low frequency fire history), that are intensively fox-baited and have low indices of fragmentation(DSEWPaC, 2010).

Critical habitat for the species as outlined in the Western Ringtail Possum (*Pseudocheirus occidentalis*) Recovery Plan (DPaW, 2017) is as follows:

> Habitat critical to survival for WRP is not well understood, and is therefore based on the habitat variables observed where WRP possums are most commonly recorded. These appear to vary between key management zones. The common themes however are high nutrient foliage availability for food, suitable structures for protection/nesting, and canopy continuity to avoid/escape predation and other threats. Long-term survival of the species requires linkages between suitable habitat patches and as such habitat critical to survival incorporates this. Vegetation communities critical to the species include long unburnt mature remnants of peppermint (*Agonis flexuosa*) woodlands with high canopy continuity and high foliage nutrients (high in nitrogen and low toxin levels); Jarrah (*Eucalyptus marginata*)/Marri (*Corymbia calophylla*) forests and woodlands with limited anthropogenic disturbance (unlogged or lightly logged, and a low intensity and low frequency fire history), that are intensively fox-baited and have low indices of fragmentation; coastal heath, Jarrah/Marri woodland and forest, peppermint woodlands, myrtaceous heaths and shrublands, Bullich (*Eucalyptus megacarpa*) dominated riparian zones and karri forest. Any habitat where WRP occur naturally are considered critical and worthy of protection.

The Survey Area is within the Swan Coastal Plain Management Zone in the Recovery Plan (DPaW, 2017).

3.4.2 Local Context and Records

Biota (2020) undertook a regional survey of WRP which estimated a combined number of over 20,000 WRP within the areas surveyed, from the three regional populations. Population estimates within the survey areas included the Swan Coastal Plain management zone at 9,270 individuals, the Southern Forest management zone at 7,500 individuals and the South Coast management zone at 3,340 WRP.

The survey area falls within the Swan Coastal Plain management zone, specifically within the SWA02 IBRA subregion subpopulation in Biota (2020). These results were based on density sampling and provide an estimate of population size for subpopulations within the Swan Coastal Plain management zone.

Total WRP habitat in the Swan Coastal Plain IBRA bioregion (south of Myalup), surveyed by Shedley & Williams (2014), combined with the surveyed area of Yalgorup National Park, yielded a total area of 366km^2, of which 12.8 % was surveyed by Biota. 'Tuart Forest Central' was the closest Biota (2020) study area to this project's Survey Area, located approximately 4 km northwest/west of the Survey Area The average encounter rate at Tuart Forest Central was 5.92 individuals per kilometre, and a total number of 414 individuals were observed over 62 transects (Biota, 2020). DBCA (2024b) database search results suggest that WRP are locally abundant, with 1534 records returned within 10 km of the Survey Area.

4 Field Survey Results

4.1 Fauna Habitats

4.1.1 General Fauna Habitats

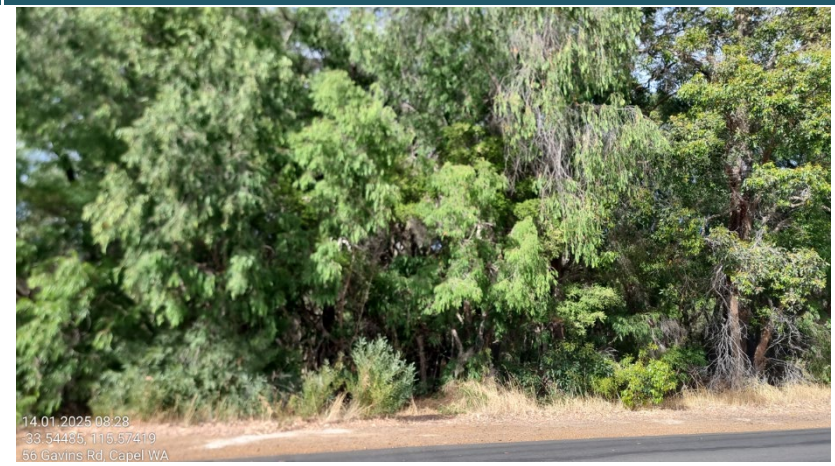
Five fauna habitat types and their corresponding vegetation descriptions (as derived from Ecoedge (2024) and adapted for this project) are listed in Table 4-1 and mapped in Figure A.3 (Appendix A):

1. Jarrah closed forest over Peppermints and *Melaleuca preissiana* on grey-brown loamy sand (0.19 ha)
2. *Banksia attenuata* and *Banksia ilicifolia* woodland with Jarrah on grey sand (1.42 ha)
3. Marri mid open forest and isolated paddock trees over scattered Peppermints and Woody pear small trees on grey-brown sandy or sandy-clay loam (4.47 ha)
4. *Melaleuca preissiana* or *Melaleuca rhaphiophylla* low forest on grey-brown clay-loam or sandy clay-loam (1.12 ha)
5. Planted *Eucalyptus* spp. trees (0.23 ha)
6. Cleared weedy grasses and herbs (10.91 ha)

R. Road (7.82 ha)

General fauna habitat quality ranged from Nil to High, with High quality habitat occurring within types one and two (Table 4-1). Remnant vegetation within the Survey Area had been subject to degradation through edge effects and weed invasion.

Table 4-1 Fauna habitat types and vegetation descriptions of the Survey Area

Type	Fauna habitat type and vegetation description*	Fauna habitat quality	Area (ha)	Photo
1.	**Mid Jarrah woodland over closed forest/shrubland of Peppermints and *Melaleuca preissiana* on grey-brown loamy sand** Vegetation Description: Mid open forest of *Eucalyptus marginata* and *Corymbia calophylla* over *Agonis flexuosa* and *Melaleuca preissiana* closed forest/shrubland over open shrubland of *Acacia extensa*, *A. pulchella*, *Adenanthos meisneri*, *Astartea scoparia*, *Dasypogon bromeliifolius*, *Jacksonia furcellata* and *Xanthorrhoea brunonis* over open herbs and sedges including *Anarthria prolifera*, *Drosera menziesii* and *Opercularia hispidula* on grey-brown loamy sand.	**General:** High **Baudin's cockatoo:** High **Carnaby's cockatoo:** High **FRTBC:** High	0.19 ha	
2	***Banksia attenuata* and *Banksia ilicifolia* woodland with Jarrah on grey sand** Vegetation Description: Woodland of *Banksia attenuata* and *B. ilicifolia* with emergent *Eucalyptus marginata* over tall open shrubland including *Kunzea glabrescens* over mid *Allocasuarina humilis*, *Dasypogon bromeliifolius*, *Hibbertia hypericoides*, *Hypocalymma robustum*, *Stirlingia latifolia* over open forbland including *Burchardia congesta, Conostylis aculeata*, **Ehrharta calycina* and **Ursinia anthemoides* on grey sand.	**General:** High **Baudin's cockatoo:** Low to Moderate **Carnaby's cockatoo:** High **FRTBC:** High	1.42 ha	

3	**Marri mid open forest over scattered Peppermints and Woody Pear small trees on grey-brown sandy loam** Vegetation Description: Mid open forest of *Corymbia calophylla* and isolated paddock trees over scattered *Agonis flexuosa* and *Xylomelum occidentale* small trees with occasional areas with *Acacia extensa* or *Kingia australis* tall shrubs over scattered mid shrubs including *Acacia pulchella* var. *glaberrima*, *Hibbertia hypericoides* and *Stirlingia latifolia* over closed grassland of **Cenchrus clandestinus* and **Ehrharta longiflora* on grey-brown sandy loam.	**General:** Moderate **Baudin's cockatoo:** High **Carnaby's cockatoo:** High **FRTBC:** High	4.47 ha	
4	***Melaleuca preissiana* or *Melaleuca rhaphiophylla* low forest on grey-brown clay-loam or sandy clay-loam** Vegetation Description: Low forest of *Melaleuca preissiana* or *M. rhaphiophylla* with scattered tall shrubs of *Acacia saligna* or *Astartea scoparia* over a variable understorey that may include the tall shrub *Viminaria juncea*, the fern *Pteridium esculentum*, the mid-height shrub *Sphaerolobium medium* and the sedges *Leptocarpus coangustatus* and *Lepidosperma longitudinale*, on grey-brown clay-loam or sandy clay-loam. Occasional low *Eucalyptus* spp. observed at eastern end of Survey Area.	**General:** Low **Baudin's cockatoo:** Nil **Carnaby's cockatoo:** Low **FRTBC:** Nil	1.12 ha	

5	**Planted *Eucalyptus* spp.**	**General:** Low **Baudin's cockatoo:** Low **Carnaby's cockatoo:** Low **FRTBC:** Low	0.23 ha	
6	**Cleared weedy grasses and herbs**	**General:** Low **Baudin's cockatoo:** Nil **Carnaby's cockatoo:** Nil **FRTBC:** Nil	10.91 ha	

R	**Road and road edges.**	**General:** 7.82 ha Nil **Baudin's cockatoo:** Nil **Carnaby's cockatoo:** Nil **FRTBC:** Nil	

* Vegetation descriptions adapted from Ecoedge (2024) results

4.1.2 Suitable DBH Trees and Hollows

Within the Survey Area, 203 trees with DBH measuring over 50 cm were recorded. Five of these contained hollows, with only one with a hollow potentially large enough for black cockatoos (10-15 cm aperture, Marri, ID 188, 100 cm DBH). The hollow was less than 10 m high, and no fauna were observed to be utilising the hollow at the time of survey. Signs of recent chewing were observed at the hollow entrance potentially attributed to Galah. Suitable DBH trees (*Trees with suitable DBH without hollows*) are presented in Figure A.4 (Appendix A).



Photo 4-1 Tree ID 188, Marri hollow

4.2 Fauna Results

4.2.1 General

Twenty-five fauna taxa were observed within the Survey Area across during the surveys (Table 4-2). The fauna recorded included 19 birds, five mammals and one reptile. Of the taxa observed, FRTBC are listed as Vulnerable, and WRP are listed as Critically Endangered.

Numerous other animals are likely to occur but are cryptic or would not have been detected during the surveys undertaken (such as bats, many reptiles and frogs which may not have been calling). In addition, many species may only use the site as a part of a larger area of occupancy, for example birds.

Table 4-2 Fauna recorded within the Survey Area

Class	Family	Scientific Name	Vernacular Name
Aves	Acanthizidae	*Acanthiza inornata*	Western Thornbill
Aves	Acanthizidae	*Gerygone fusca*	Western Gerygone
Aves	Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra*
Aves	Artamidae	*Artamus cinereus*	Black-Faced Woodswallow

Class	Family	Scientific Name	Vernacular Name
Aves	Artamidae	*Gymnorhina tibicen*	Australian Magpie
Aves	Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-Tailed Black Cockatoo
Aves	Campephagidae	*Coracina novaehollandiae*	Black-Faced Cuckoo-Shrike
Aves	Columbidae	*Ocyphaps lophotes*	Crested Pigeon
Ave	Hirundinidae	*Petrochelidon nigricans*	Tree Martin
Ave	Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill
Ave	Monarchidae	*Grallina cyanoleuca*	Magpie-Lark
Ave	Motacillidae	*Anthus novaeseelandiae*	Australian Pipit
Ave	Pardalotidae	*Sericornis frontalis*	White-Browed Scrubwren
Ave	Psittaculidae	*Barnardius zonarius*	Australian Ringneck
Ave	Psittaculidae	*Platycercus icterotis*	Western Rosella
Ave	Psittaculidae	*Purpureicephalus spurius*	Red-Capped Parrot
Ave	Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail
Ave	Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail
Ave	Zosteropidae	*Zosterops lateralis*	Silvereye
Mammalia	Canidae	*Vulpes vulpes*	Fox*
Mammalia	Leporidae	*Oryctolagus cuniculus*	Rabbit*
Mammalia	Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo
Mammalia	Phalangeridae	*Trichosurus vulpecular*	Common Brushtail Possum
Mammalia	Pseudocheiridae	*Pseudocheirus occidentalis*	Western Ringtail Possum
Reptilia	Elapidae	*Pseudonaja affinis*	Dugite

* Introduced or naturalised

4.2.2 Conservation Significant Fauna Post-Survey Likelihood of Occurrence

A threatened fauna evaluation table was prepared for conservation significant fauna based on the desktop assessment and site survey (Appendix D). It excludes aquatic, marine, marine migratory, and regionally extinct species. Fauna of conservation significance that may occur are summarised in Table 4-3.

Of the 17 terrestrial vertebrate fauna of conservation significance, two taxa were recorded at the site: FRTBC and WRP. Five other taxa may occur within the Survey Area, at times. Black cockatoos are considered further in Section 4.2.3, as the vegetation within the Survey Area contains known foraging species (no confirmed breeding trees or roosting habitat recorded). Peregrine Falcon, Quenda, and South-western Brush-tailed Phascogale may also occur (Table 4-3).

Table 4-3 Conservation significant fauna that may occur within the Survey Area, based on habitat suitability and field observations.

Genus species	Vernacular	Status Federal	Stat. WA	Presence of habitat	Likelihood of occurrence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	Present - core	Present

Genus species	Vernacular	Status Federal	Stat. WA	Presence of habitat	Likelihood of occurrence
Zanda baudinii	Baudin's Cockatoo	EN	EN	Present - core	Possible
Zanda latirostris	Carnaby's Cockatoo	EN	EN	Present - core	Possible
Falco peregrinus	Peregrine Falcon	–	OS	Present - supporting	Possible
Isoodon obesulus fusciventer	Quenda, Southern Brown Bandicoot	–	P4	Present - supporting	Possible
Pseudocheirus occidentalis	Western Ringtail Possum	CR	CR	Present - core	Present
Phascogale tapoatafa wambenger	South-western Brush-tailed Phascogale, Wambenger		CD	Present - supporting	Possible

Peregrine Falcon

The Survey Area may be utilised by Peregrine Falcon for hunting, and they are likely to pass through the area. No suitable breeding ground was observed.

Quenda, Southern Brown Bandicoot

There was no evidence of Quenda observed during the survey, however, given the presence of suitable habitat and connection to a larger patch outside of the Survey Area, Quenda may potentially occur. The small area of habitat at any one location within the Survey Area would only form a small part of a larger habitat patch if a population of this species was to occur.

South-western Brush-tailed Phascogale, Wambenger

There was no evidence of South-western Brush-tailed Phascogales observed during the survey, however suitable habitat does occur within habitat types 1 and 3 (Jarrah Marri Forest). Hollow-bearing Marri trees were evident that may be utilised by phascogales.

4.2.3 Black Cockatoos

Foraging

No Baudin's or Carnaby's cockatoo foraging residue was observed during the survey. FRTBC were observed feeding within the Survey Area. Foraging residue for FRTBC was also generally low across the Survey Area. The overall Survey Area contains (from Appendix E):

- One primary and four secondary foraging plant taxa for Baudin's cockatoo,
- five primary and seven secondary foraging plant taxa for Carnaby's cockatoo, and
- two primary and three secondary foraging plant taxa for FRTBC.

Fauna habitat types 1 – 3 contain key structural species (Marri, Jarrah and *Banksia attenuata*) that are associated with High quality foraging habitat for black cockatoos (with the exception of Habitat Type 2 being of Low to Moderate quality for Baudin's cockatoo), as detailed in Table 4-4. Habitat Type 4 contained Low quality foraging value habitat for Carnaby's cockatoo, with one secondary foraging species observed (Table 4-4). Habitat types 5 (Planted *Eucalyptus* spp.), 6 (Cleared), and the area of

paved road with the Survey Area were not included in Table 4-4, as they provided no value to black cockatoo foraging.

Although no Baudin's or Carnaby's cockatoos were observed during survey, it is likely that they would utilise the site for foraging due to the habitat values present.

Table 4-4 Black cockatoo foraging species across habitat types that contained Primary or Secondary foraging spp.

	Primary Foraging Species	Secondary Foraging Species	Habitat Quality
Habitat Type 1 – Jarrah closed forest (0.16 ha, Degraded to Excellent vegetation condition)			
Baudin's cockatoo	*Corymbia calophylla*	*Eucalyptus marginata*	**High**
Carnaby's cockatoo	*Corymbia calophylla* *Eucalyptus marginata*	*Agonis flexuosa* *Jacksonia furcellata*	**High**
FRTBC	*Corymbia calophylla* *Eucalyptus marginata*	–	**High**
Habitat Type 2 – *Banksia* spp. woodland (1.56 ha, Completely Degraded to Excellent vegetation condition)			
Baudin's cockatoo	–	*Eucalyptus marginata* *Banksia attenuata*	**Low to Moderate**
Carnaby's cockatoo	*Eucalyptus marginata* *Banksia attenuata*	*Allocasuarina humilis*	**High**
FRTBC	*Eucalyptus marginata*	*Allocasuarina humilis*	**High**
Habitat Type 3 – Marri mid open forest (3.32 ha, Completely Degraded to Degraded vegetation condition)			
Baudin's cockatoo	*Corymbia calophylla*	*Kingia australis*	**High**
Carnaby's cockatoo	*Corymbia calophylla*	*Agonis flexuosa* *Xylomelum occidentale*	**High**
FRTBC	*Corymbia calophylla*	*Xylomelum occidentale*	**High**
Habitat Type 4 – *Melaleuca spp.* low forest (0.62 ha, Completely Degraded to Good vegetation condition)			
Baudin's cockatoo	–	–	**Nil**
Carnaby's cockatoo	–	*Acacia saligna*	**Low**
FRTBC	–	–	**Nil**

Breeding

Habitat Types 1 and 3 contained potential breeding habitat for black cockatoos (consisted of at least one suitable DBH tree), with Habitat 3 being most suitable due to the greater quantity of suitable DBH trees and Marri-Jarrah dominated canopy. Habitat Types 2, 4, 5 and 6 did not contain potential breeding habitat, due to the lack of suitable DBH trees available. Black cockatoo foraging habitat quality across the Survey Area is presented in Figure A.4 (Appendix A).

A total of six hollows bearing trees were observed within the Survey Area (as outlined in Appendix F). 203 trees with DBH measuring over 50 cm were recorded. Five of these were *Trees with suitable DBH with unsuitable hollows*), and only one was a *Tree with potentially suitable size hollow with signs of use* (10-15 cm aperture, Marri, ID 188, 100 cm DBH). The hollow was less than 10 m high, and no fauna were observed to be utilising the hollow at the time of survey. Signs of recent chewing were observed at the hollow entrance potentially attributed to Galah. Suitable DBH trees (*Trees with suitable DBH without hollows*) are presented in Figure A.4 (Appendix A).

The DBCA (2024b) compiled WTBC breeding site locations dataset returned one breeding tree known from within 6 km of the Survey Area. The record, with breeding last confirmed in 2019, is located ~1.3 km south of the eastern section of the Survey Area (DBCA, 2024b).

Although these hollows were deemed as unsuitable for black cockatoos, they may still be utilised by other target fauna (WRP) or other taxa. No black cockatoo roosts or active breeding trees were recorded within the Survey Area.

4.2.4 WRP

The nocturnal surveys identified a total of six WRP, with a maximum of four on the second night, on the 23rd of January 2025, with only two WRP encountered on the first night, the 21st of January 2025. A total of six CBP were also observed across the two nights, with four found on the first night (21st) and two on the second night (23rd). Locations are presented in Figure A.5 (Appendix A). No Phascogales were observed during the nocturnal surveys, and they are unlikely to be common through the Survey Area due to the lack of hollows. One WRP drey was observed.

The Survey Area is likely to broadly align with Critical habitat for the species as outlined in the Western Ringtail Possum (*Pseudocheirus occidentalis*) Recovery Plan (DPaW, 2017). Further WRP occurrences are most likely to occur on the western half of the site, due to the presence of closed Peppermint shrubland (0.16 ha), a habitat type containing a high density of key foraging species for WRP (predominantly *Agonis flexuosa*). This inference was reflected in nocturnal spotlighting results, with all six WRP observations occurring in the western half of the Survey Area, across two habitat types. Five WRP were located within Habitat Type 1. The remaining single observation occurred in Habitat Type 3.

5 Conclusions

The following points summarise the fauna values of the Survey Area:

- The Survey Area includes 26.15 ha of road and verge on both sides of the road between 0.00 and 12.00 SLK, Gavins Road.
- Road reserve remnant vegetation covers 7.19 ha of the Survey Area.
- Five fauna habitat types occur within the Survey Area:
    1. Jarrah closed forest over Peppermints and *Melaleuca preissiana* on grey-brown loamy sand (0.19 ha)
    2. *Banksia attenuata* and *Banksia ilicifolia* woodland with Jarrah on grey sand (1.42 ha)
    3. Marri mid open forest and isolated paddock trees over scattered Peppermints and Woody pear small trees on grey-brown sandy or sandy-clay loam (4.47 ha)
    4. *Melaleuca preissiana* or *Melaleuca rhaphiophylla* low forest on grey-brown clay-loam or sandy clay-loam (1.12 ha)
    5. Planted *Eucalyptus* spp. trees (0.23 ha)
    6. Cleared weedy grasses and herbs (10.91 ha)
    R. Road (7.82 ha)
- Searches within the DSA yielded 211 vertebrate terrestrial fauna species; 10 amphibians, 163 birds, 17 mammals and 21 reptiles.

- Seventeen terrestrial vertebrate fauna of conservation significance were returned in desktop searches Additionally, desktop searches returned freshwater aquatic taxa inclusive of two fish, one bivalve, crayfish and a pouched lamprey.
- Conservation significant fauna observed during survey included FRTBC and WRP.
- Baudin's cockatoo, Carnaby's cockatoo, Quendas, Peregrine Falcons and South-western Brush-tailed Phascogales have the potential to occur. Further black cockatoo taxa are likely to utilise the site for foraging, however no (likely) breeding or roosting habitat was recorded.
- Vegetation within fauna Habitat Types 1 – 2 were of high value for general fauna taxa. Habitat Types 1 – 3 contained key structural species associated with High Quality black cockatoo habitat, except for Type 2 which was considered Low – Moderate quality for Baudin's cockatoo.
- No current black cockatoo breeding hollows or roosts were recorded during the survey.
- Of the 203 trees with DBH measurements exceeding 50 cm, one potentially suitable breeding hollow was identified (tree ID 188). Although technically suitable based on hollow dimensions, the hollow in tree ID 188 was considered unlikely to be used by black cockatoos due to the low height and relatively tight internal cavity.
- Available hollows may be utilised by target fauna other than black cockatoos (WRP).

The following recommendations should be considered:

- Clearing of native vegetation should be minimised.
- Clearing schedules should be planned to avoid spring breeding peaks.
- An authorised fauna spotter should be present during clearing of hollow bearing trees and Habitat Types 1 – 3 to manage hollow dependant fauna and WRP.
- Weed management and infill planting could be considered in adjacent degraded areas.
- Artificial hollow installation should be considered if the existing hollows are to be cleared.
- Once the final impact area (proposed action) is known, the proposal should be assessed against the DAWE (2022) Foraging quality scoring tool (template in Table 2-5, Section 2.2.2 of this report).
- Proposed impacts to WRP and their habitat should be assessed against the Commonwealth Matters of National Environmental Significance – *Significant impact guidelines 1.1* (DEWHA, 2009).

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Appendix A Figures

Figure A.1 Survey area
Figure A.2 Desktop Study Area
Figure A.3 Fauna habitats
Figure A.4 Suitable DBH trees and black cockatoo foraging habitat quality
Figure A.5 Nocturnal survey results

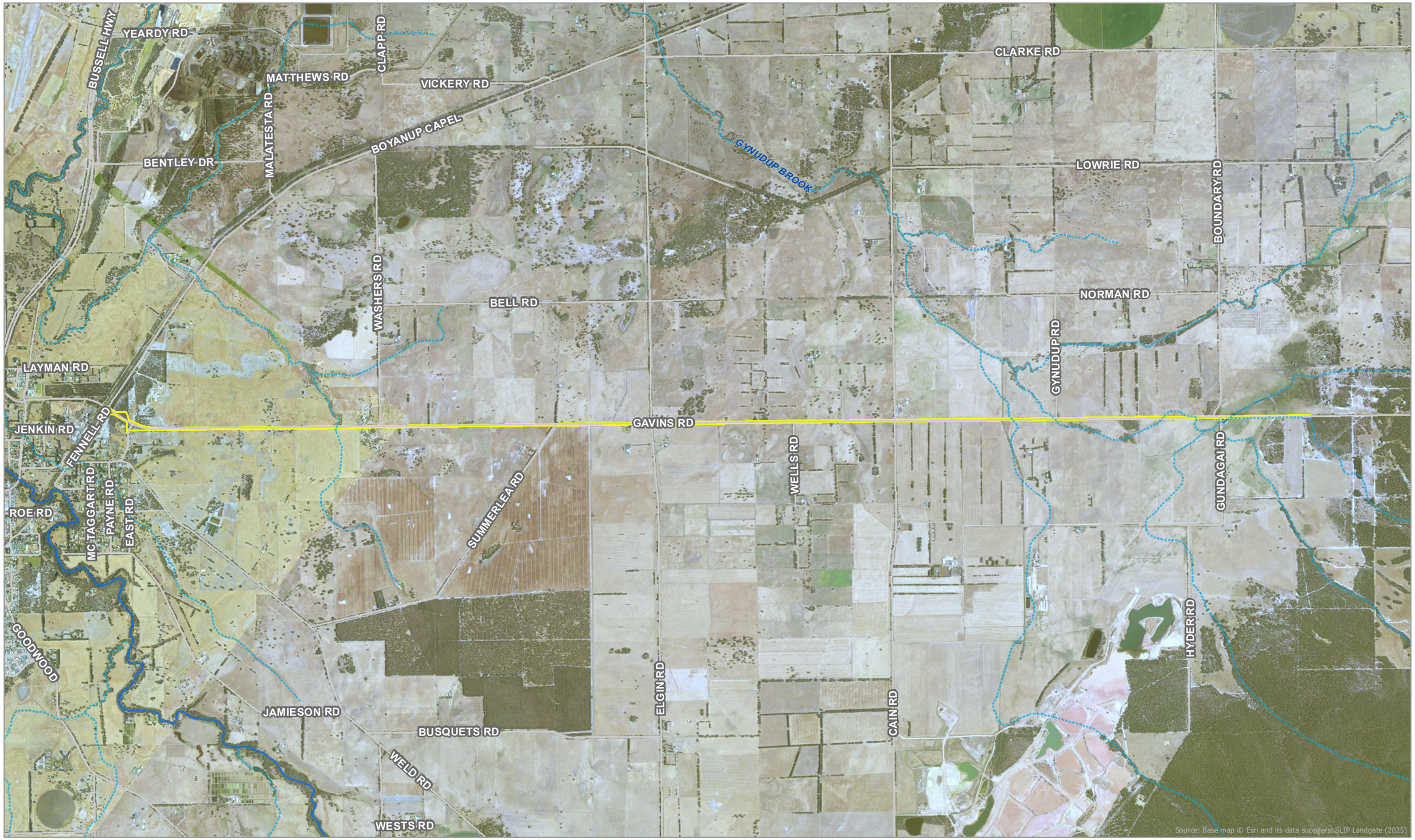
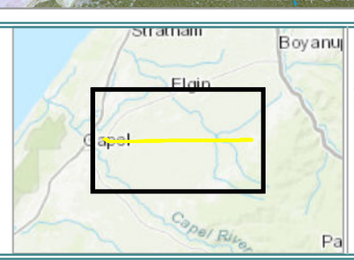


FIGURE A.1 SURVEY AREA

GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

- Major watercourse
- Minor drainage line
- Road
- Survey Area



A3 @ 1:35000

0 0.25 0.5 1 km

GRID: GDA zone 50

N

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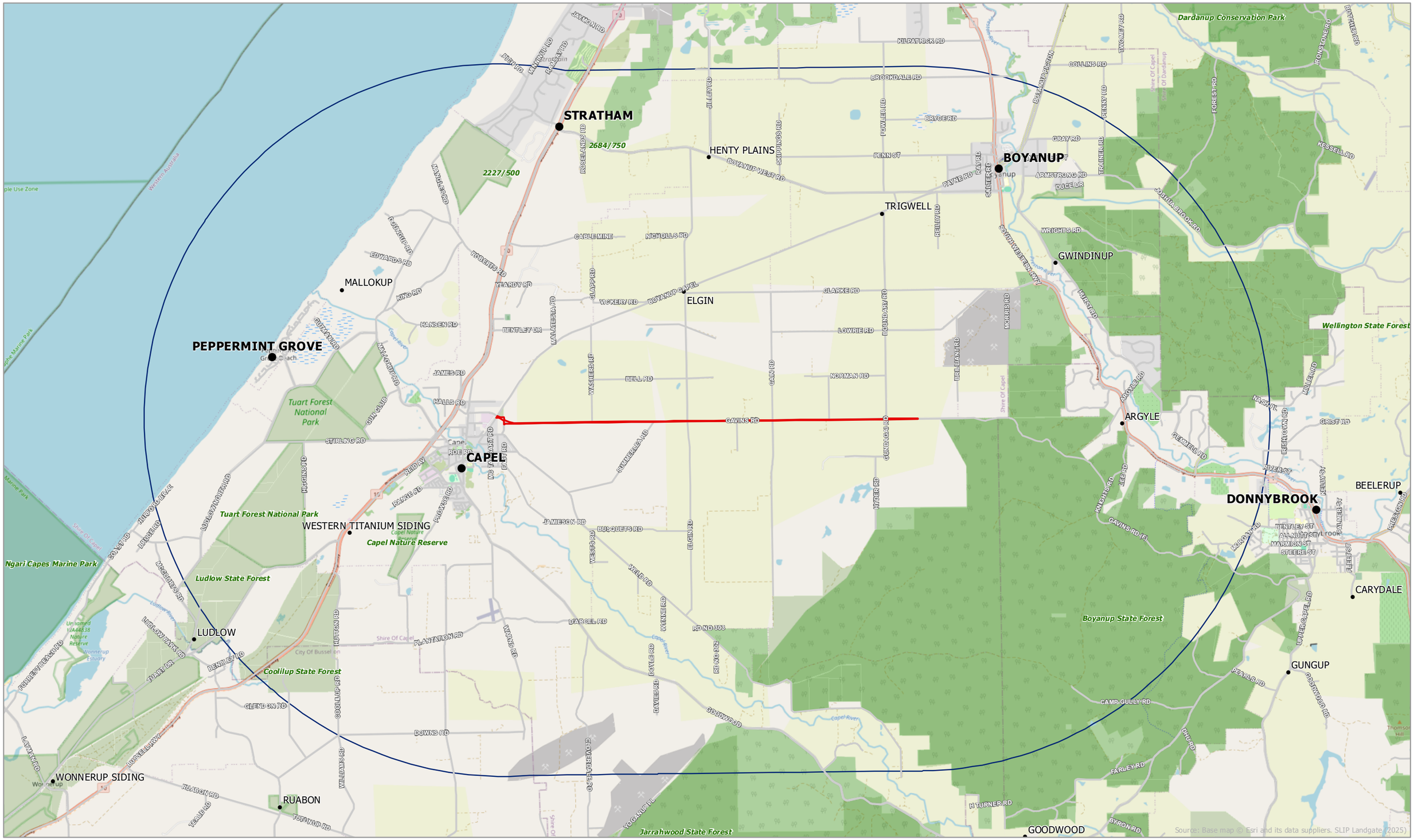
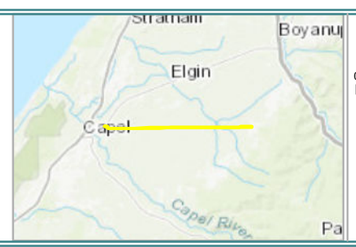


FIGURE A.2 DESKTOP STUDY AREA

GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

- Survey Area
- Road
- Desktop Study Area
- DBCA managed land



A3 @ 1:100000

0 0.5 1 2 km

GRID: GDA zone 50

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FIGURE A.3 FAUNA HABITATS

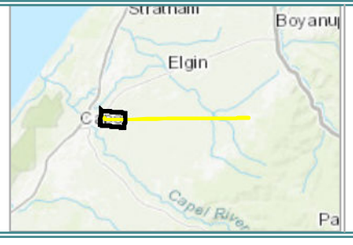
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
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- Minor drainage line
- Road
- Survey Area

Fauna Habitat

- 1 Jarrah closed forest over Peppermints and *Melaleuca preissiana* on grey-brown loamy sand
- 2 *Banksia attenuata* and *Banksia ilicifolia* woodland with Jarrah on grey sand
- 3 Marri mid open forest and isolated paddock trees over scattered Peppermints and Woody pear small trees on grey-brown sandy or sandy-clay loam
- 6 Cleared weedy grasses and herbs
- R Road



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

N

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FIGURE A.3 FAUNA HABITATS

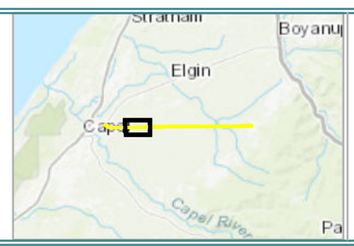
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

- Minor drainage line
- Road
- Survey Area

Fauna Habitat

- 3 Marri mid open forest and isolated paddock trees over scattered Peppermints and Woody pear small trees on grey-brown sandy or sandy-clay loam
- 6 Cleared weedy grasses and herbs
- R Road



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

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FIGURE A.3 FAUNA HABITATS

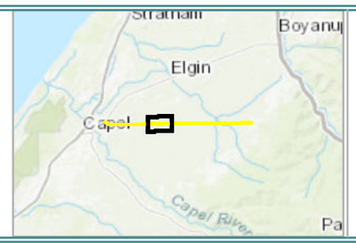
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

Road
Survey Area

Fauna Habitat

3 Marri mid open forest and isolated paddock trees over scattered Peppermints and Woody pear small trees on grey-brown sandy or sandy-clay loam
6 Cleared weedy grasses and herbs
R Road



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

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FIGURE A.3 FAUNA HABITATS

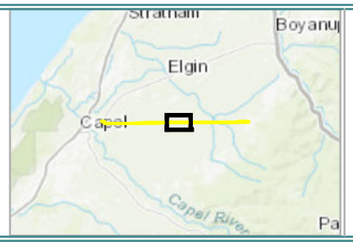
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

Road
Survey Area

Fauna Habitat

- 3 Marri mid open forest and isolated paddock trees over scattered Peppermints and Woody pear small trees on grey-brown sandy or sandy-clay loam
- 6 Cleared weedy grasses and herbs
- R Road



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

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FIGURE A.3 FAUNA HABITATS

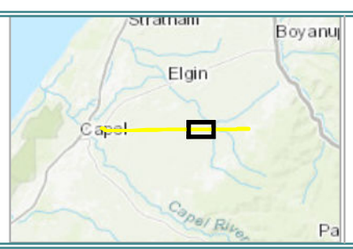
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

- Minor drainage line
- Road
- Survey Area

Fauna Habitat

- 3 Marri mid open forest and isolated paddock trees over scattered Peppermints and Woody pear small trees on grey-brown sandy or sandy-clay loam
- 5 Planted Eucalyptus spp. trees
- 6 Cleared weedy grasses and herbs
- R Road



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

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FIGURE A.3 FAUNA HABITATS

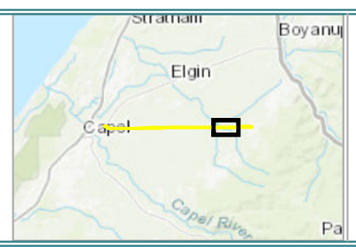
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

- Minor drainage line
- Road
- Survey Area

Fauna Habitat

- 3 Marri mid open forest and isolated paddock trees over scattered Peppermints and Woody pear small trees on grey-brown sandy or sandy-clay loam
- 4 *Melaleuca preissiana* or *Melaleuca rhaphiophylla* low forest on grey-brown clay-loam or sandy clay-loam
- 5 Planted Eucalyptus spp. trees
- 6 Cleared weedy grasses and herbs
- R Road



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

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FIGURE A.3 FAUNA HABITATS

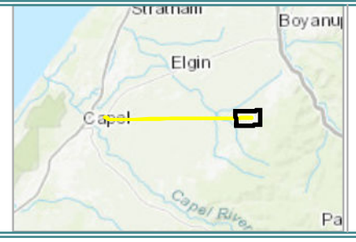
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

- Minor drainage line
- Road
- Survey Area

Fauna Habitat

- 4 *Melaleuca preissiana* or *Melaleuca rhaphiophylla* low forest on grey-brown clay-loam or sandy clay-loam
- 6 Cleared weedy grasses and herbs
- R Road



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

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FIGURE A.4 SUITABLE DBH TREES AND BLACK COCKATOO FORAGING HABITAT QUALITY

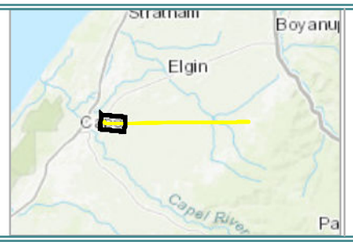
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

- Minor drainage line
- Road
- Drey (WRP)
- Tree with suitable DBH without hollows
- Tree with potentially suitable size hollow with signs of use
- Tree with suitable DBH with unsuitable hollow
- Survey Area

Black cockatoo foraging habitat value

- High quality foraging habitat for black cockatoos
- High quality foraging value habitat Carnaby's cockatoo and FRTBC and Low to Moderate quality Baudin's cockatoo
- No or low quality foraging value habitat for black cockatoos
- No habitat



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

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FIGURE A.4 SUITABLE DBH TREES AND BLACK COCKATOO FORAGING HABITAT QUALITY

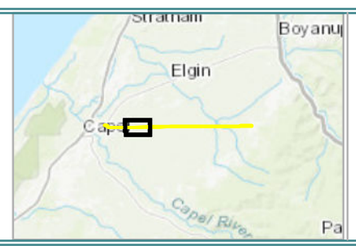
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

- Minor drainage line
- Road
- Tree with suitable DBH without hollows
- Tree with potentially suitable size hollow with signs of use
- Tree with suitable DBH with unsuitable hollow
- Survey Area

Black cockatoo foraging habitat value

- High quality foraging habitat for black cockatoos
- No or low quality foraging value habitat for black cockatoos
- No habitat



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

N

SW environmental
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FIGURE A.4 SUITABLE DBH TREES AND BLACK COCKATOO FORAGING HABITAT QUALITY

GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

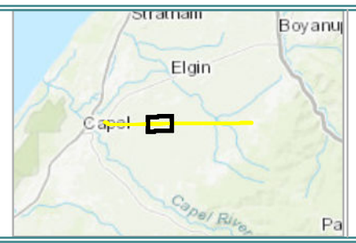
Ref: SW558
Date: 19/03/2025 Author: SP

GAVINS RD
SUMMERLEA RD
ELGIN RD

— Road
○ Tree with suitable DBH without hollows
◉ Tree with suitable DBH with unsuitable hollow
□ Survey Area

Black cockatoo foraging habitat value

■ High quality foraging habitat for black cockatoos
■ No or low quality foraging value habitat for black cockatoos
□ No habitat



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

N

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FIGURE A.4 SUITABLE DBH TREES AND BLACK COCKATOO FORAGING HABITAT QUALITY

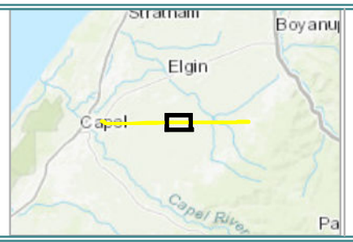
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

- Road
- Tree with suitable DBH without hollows
- Tree with suitable DBH with unsuitable hollow
- Survey Area

Black cockatoo foraging habitat value

- High quality foraging habitat for black cockatoos
- No or low quality foraging value habitat for black cockatoos
- No habitat



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

N

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FIGURE A.4 SUITABLE DBH TREES AND BLACK COCKATOO FORAGING HABITAT QUALITY

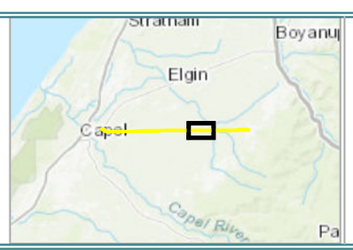
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

- Minor drainage line
- Road
- Tree with suitable DBH without hollows
- Survey Area

Black cockatoo foraging habitat value

- High quality foraging habitat for black cockatoos
- No or low quality foraging value habitat for black cockatoos
- No habitat



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

N

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Base map © ESRI and its data suppliers. SLIP Landgate (2025)

FIGURE A.4 SUITABLE DBH TREES AND BLACK COCKATOO FORAGING HABITAT QUALITY

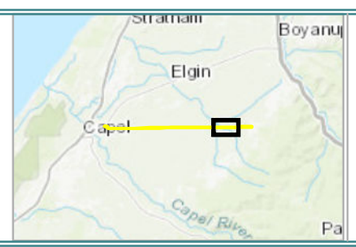
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

- Minor drainage line
- Road
- Tree with suitable DBH without hollows
- Survey Area

Black cockatoo foraging habitat value

- High quality foraging habitat for black cockatoos
- Low quality foraging value habitat for Carnaby's cockatoo
- No or low quality foraging value habitat for black cockatoos
- No habitat



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

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FIGURE A.4 SUITABLE DBH TREES AND BLACK COCKATOO FORAGING HABITAT QUALITY

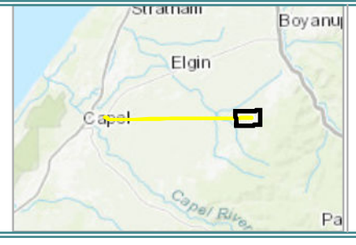
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

- Minor drainage line
- Road
- Survey Area

Black cockatoo foraging habitat value

- Low quality foraging value habitat for Carnaby's cockatoo
- No or low quality foraging value habitat for black cockatoos
- No habitat



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

N

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FIGURE A.5 NOCTURNAL SURVEY RESULTS

GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

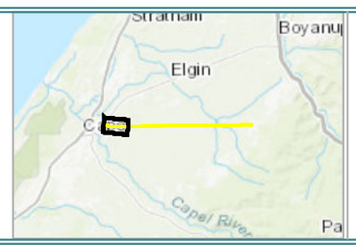
- Minor drainage line
- Road

Taxon, Abundance

- Western ringtail possum, 1
- Western ringtail possum, 2
- Survey Area

Survey effort

- 21/01/2025
- 23/01/2025



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

N

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FIGURE A.5 NOCTURNAL SURVEY RESULTS

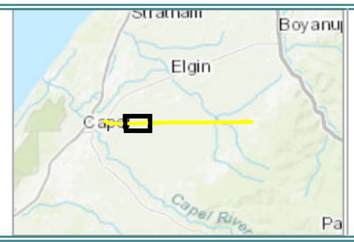
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

Minor drainage line
Road
Survey Area

Survey effort

21/01/2025
23/01/2025



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

N

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FIGURE A.5 NOCTURNAL SURVEY RESULTS

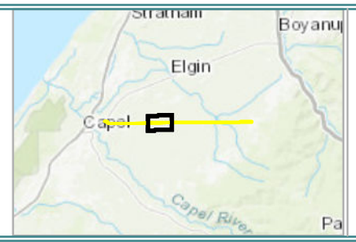
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

Road
Survey Area

Survey effort

21/01/2025
23/01/2025



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

N

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FIGURE A.5 NOCTURNAL SURVEY RESULTS

GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

Road

Taxon, Abundance

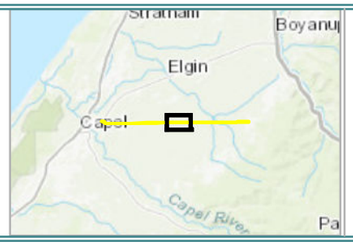
Common brushtail possum, 2

Survey Area

Survey effort

21/01/2025

23/01/2025



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

N

SW environmental

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FIGURE A.5 NOCTURNAL SURVEY RESULTS

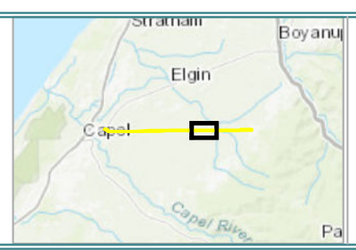
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

Minor drainage line
Road

Taxon, Abundance
Common brushtail possum
Survey Area

Survey effort
21/01/2025
23/01/2025



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

N

SW environmental
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FIGURE A.5 NOCTURNAL SURVEY RESULTS

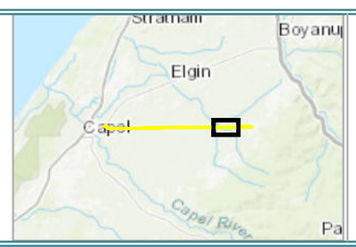
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

- Minor drainage line
- Road
- Survey Area

Survey effort

- 21/01/2025
- 23/01/2025



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

N

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FIGURE A.5 NOCTURNAL SURVEY RESULTS

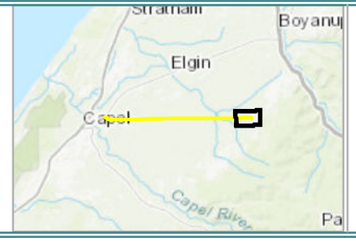
GAVINS ROAD (SLK 0.0 TO12.0), CAPEL

Ref: SW558
Date: 19/03/2025 Author: SP

- Minor drainage line
- Road
- Survey Area

Survey effort

- 21/01/2025
- 23/01/2025



A3 @ 1:5000

0 25 50 100 m

GRID: GDA zone 50

N

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Appendix B Conservation Codes

Fauna in WA may be afforded protection under the WA BC Act and or federal EPBC Act. Species listed as threatened or migratory under the above legislation are referred to collectively in this document as being 'conservation significant' or 'target' species. These terms include species and communities listed under the DBCA Priority lists.

BC Act

The WA BC Act and associated Regulations provide for the licensing and management of activities that affect biodiversity. The BC Act provides for the listing of threatened native animals (fauna) that need protection as critically endangered, endangered or vulnerable species because they are under identifiable threat of extinction (species).

The *Biodiversity Conservation (Listing of Native Species) (Fauna) Order 2023)* under the *Biodiversity Conservation Regulations 2018* contain the lists of Threatened, Extinct and Specially Protected species under Part 2 of the BC Act. These are described below.

Threatened species and communities

- PD: Presumed totally destroyed (TECs only)
- CR: Critically endangered species
- EN: Endangered species
- VU: Vulnerable species

Extinct species

- EX: Extinct species
- EW: Extinct in the wild species

Specially protected species

- MI: Migratory species
- CD: Species of special conservation interest (conservation dependent fauna)
- OS: Other specially protected species

Priority species and communities

- Priority 1: Poorly-known species
- Priority 2: Poorly-known species
- Priority 3: Poorly-known species
- Priority 4: Rare, Near Threatened and other species in need of monitoring
- Priority Ecological Community (PEC): Where communities are considered rare but not (currently) threatened or there is insufficient information available for the community to be considered a TEC, communities can be listed as priority ecological communities (PECs).

A full description of conservation codes is provided in Appendix B.

EPBC Act

In accordance with Commonwealth legislation, the EPBC Act provides a list of 'Matters of National Environmental Significance' (NES), which includes significant fauna. Under the EPBC Act fauna matters of NES may be listed in any one of the following categories as defined in *Section 179* of the Act:

- Extinct,
- *Extinct in the wild,
- *Critically endangered,
- *Endangered,
- *Vulnerable,
- Conservation dependent.

*Only these categories are matters of NES under the Act.

The EPBC Act also lists migratory species that are recognized under international treaties including the Japan Australia Migratory Bird Agreement (JAMBA), the China Australia Migratory Bird Agreement (CAMBA) and the Bonn Convention (The Convention on the conservation of Migratory Species of Wild Animals). The EPBC Act is regulated by the DCCEEW.

IUCN Red List

The IUCN Red List is an inventory of the global conservation status of species and used to assist DBCA and other agencies in attributing a given threatened species status. It does not have any statutory authority and is not considered in detail in this assessment.

Appendix C Potential Fauna List and Fauna Recorded

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: 12-Nov-2024

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Appendix C.1 Fauna that has been recorded or may occur within the DSA (10 km) and fauna recorded

Class	Family	Scientific Name	Vernacular Name	Observed	WA Status	EPBC Status	ALA 2024	Danjoo 2024	DBCA 2024	PMST 2024	Birdata 2024
Actinopterygii	Percichthyidae	*Nannatherina balstoni*	Balston's Pygmy Perch			VU				X	
Actinopterygii	Galaxiidae	*Galaxiella nigrostriata*	Blackstriped Dwarf Galaxias		EN		X		X		
Amphibia	Myobatrachidae	*Crinia georgiana*	Tschudi's Froglet, Quacking Frog				X	X			
Amphibia	Myobatrachidae	*Crinia glauerti*	Glauert's Froglet				X	X			
Amphibia	Myobatrachidae	*Crinia insignifera*	Sign-Bearing Froglet				X	X			
Amphibia	Myobatrachidae	*Crinia pseudinsignifera*	Bleating Froglet				X	X			
Amphibia	Myobatrachidae	*Geocrinia leai*	Lea'S Frog, Ticking Frog				X	X			
Amphibia	Limnodynastidae	*Heleioporus eyrei*	Moaning Frog				X	X			
Amphibia	Limnodynastidae	*Limnodynastes dorsalis*	Western Banjo Frog				X	X			
Amphibia	Pelodryadidae	*Litoria adelaidensis*	Slender Tree Frog				X	X			
Amphibia	Pelodryadidae	*Litoria moorei*	Western Green And Golden Bell Frog				X	X			
Amphibia	Myobatrachidae	*Pseudophryne guentheri*	Gunther's Toadlet				X				
Arachnida	Migidae	*Bertmainius opimus*	Western Pygmy Trapdoor Spider		P3				X		
Arachnida	Idiopidae	*Idiosoma sigillatum*	Swan Coastal Plain Shield-Backed Trapdoor Spider		P3		X		X		
Aves	Ardeidae	*Botaurus poiciloptilus*	Australasian Bittern		EN	EN			X	X	
Aves	Anhingidae	*Anhinga novaehollandiae*	Australasian Darter				X				X
Aves	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian Grebe				X				X
Aves	Anatidae	*Spatula rhynchotis*	Australasian Shoveler				X				X
Aves	Falconidae	*Falco longipennis*	Australian Hobby				X				X
Aves	Artamidae	*Gymnorhina tibicen*	Australian Magpie	x			X				X
Aves	Aegothelidae	*Aegotheles cristatus*	Australian Owlet-Nightjar				X				X

Class	Family	Scientific Name	Vernacular Name	Observed	WA Status	EPBC Status	ALA 2024	Danjoo 2024	DBCA 2024	PMST 2024	Birdata 2024
Aves	Pelecanidae	*Pelecanus conspicillatus*	Australian Pelican				x				X
Aves	Motacillidae	*Anthus novaeseelandiae*	Australian Pipit	x			x				X
Aves	Corvidae	*Corvus coronoides*	Australian Raven				x				X
Aves	Acrocephalidae	*Acrocephalus australis*	Australian Reed Warbler				x				X
Aves	Psittaculidae	*Barnardius zonarius*	Australian Ringneck	x			x				X
Aves	Anatidae	*Tadorna tadornoides*	Australian Shelduck				x				X
Aves	Rallidae	*Porzana fluminea*	Australian Spotted Crake								X
Aves	Threskiornithidae	*Threskiornis moluccus*	Australian White Ibis				x				X
Aves	Anatidae	*Chenonetta jubata*	Australian Wood Duck				x				X
Aves	Columbidae	*Geopelia humeralis*	Bar-Shouldered Dove				x				
Aves	Scolopacidae	*Limosa lapponica*	Bar-Tailed Godwit		MI	MI			x		
Aves	Cacatuidae	*Zanda baudinii*	Baudins Cockatoo		EN	EN	x		x	x	X
Aves	Charadriidae	*Vanellus tricolor*	Banded Lapwing								X
Aves	Recurvirostridae	*Cladorhynchus leucocephalus*	Banded Stilt								x
Aves	Rallidae	*Zapornia pusilla*	Ballion's Crake								X
Aves	Ardeidae	*Ixobrychus flavicollis australis*	Black Bittern (Southwest Subpopulation)		P2				x		
Aves	Anatidae	*Cygnus atratus*	Black Swan				x	x			X
Aves	Campephagidae	*Coracina novaehollandiae*	Black-Faced Cuckoo-Shrike	x			x				X
Aves	Artamidae	*Artamus cinereus*	Black-Faced Woodswallow	x			x				X
Aves	Charadriidae	*Elseyornis melanops*	Black-Fronted Dotterel				x				X
Aves	Accipitridae	*Elanus axillaris*	Black-Shouldered Kite				x				X
Aves	Recurvirostridae	*Himantopus himantopus*	Black-Winged Stilt				x				
Aves	Scolopacidae	*Limosa limosa*	Black-Tailed Godwit								x

Class	Family	Scientific Name	Vernacular Name	Observed	WA Status	EPBC Status	ALA 2024	Danjoo 2024	DBCA 2024	PMST 2024	Birdata 2024
Aves	Anatidae	*Oxyura australis*	Blue-Billed Duck		P4		x		x		X
Aves	Falconidae	*Falco berigora*	Brown Falcon				x				X
Aves	Accipitridae	*Accipiter fasciatus*	Brown Goshawk				x				X
Aves	Meliphagidae	*Lichmera indistincta*	Brown Honeyeater				x				X
Aves	Locustellidae	*Cincloramphus cruralis*	Brown Songlark				x				X
Aves	Columbidae	*Phaps elegans*	Brush Bronzewing								x
Aves	Rallidae	*Hypotaenidia philippensis*	Buff-Banded Rail				x				X
Aves	Cacatuidae	*Zanda latirostris*	Carnabys Cockatoo		EN	EN	x		x	x	X
Aves	Laridae	*Hydroprogne caspia*	Caspian Tern		MI		x		x		X
Aves	Ardeidae	*Bubulcus ibis*	Cattle Egret				x				X
Aves	Anatidae	*Anas castanea*	Chestnut Teal								X
Aves	Cacatuidae	*Nymphicus hollandicus*	Cockatiel				x				
Aves	Accipitridae	*Accipiter cirrocephalus*	Collared Sparrowhawk								X
Aves	Columbidae	*Phaps chalcoptera*	Common Bronzewing				x				X
Aves	Scolopacidae	*Tringa nebularia*	Common Greenshank		MI	MI	x		x	x	X
Aves	Anatidae	*Anas platyrhynchos*	Common Mallard				x				X
Aves	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper		MI	MI	x		x		X
Aves	Columbidae	*Ocyphaps lophotes*	Crested Pigeon	x			x				X
Aves	Rallidae	*Gallinula tenebrosa*	Dusky Moorhen				x				X
Aves	Artamidae	*Artamus cyanopterus*	Dusky Woodswallow				x				X
Aves	Psittaculidae	*Neophema elegans*	Elegant Parrot				x				X
Aves	Casuariidae	*Dromaius novaehollandiae*	Emu				x				X
Aves	Rallidae	*Fulica atra*	Eurasian Coot				x				X
Aves	Cuculidae	*Cacomantis flabelliformis*	Fan-Tailed Cuckoo				x				X
Aves	Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-Tailed Black Cockatoo	x	VU	VU	x		x	x	x
Aves	Anatidae	*Stictonetta naevosa*	Freckled Duck				x				X

Class	Family	Scientific Name	Vernacular Name	Observed	WA Status	EPBC Status	ALA 2024	Danjoo 2024	DBCA 2024	PMST 2024	Birdata 2024
Aves	Cacatuidae	*Eolophus roseicapilla*	Galah				x				X
Aves	Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis		MI		x		x		X
Aves	Pachycephalidae	*Pachycephala pectoralis*	Golden Whistler				x				X
Aves	Phalacrocoracidae	*Phalacrocorax carbo*	Great Cormorant				x				X
Aves	Phalacrocoracidae	*Phalacrocorax varius*	Great Pied Cormorant				x				X
Aves	Ardeidae	*Ardea alba*	Great Egret				x				X
Aves	Artamidae	*Cracticus torquatus*	Grey Butcherbird				x				X
Aves	Artamidae	*Strepera versicolor*	Grey Currawong				x				X
Aves	Falconidae	*Falco hypoleucos*	Grey Falcon			VU				x	
Aves	Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail	x			x				X
Aves	Charadriidae	*Pluvialis squatarola*	Grey Plover		MI	MI			x		
Aves	Pachycephalidae	*Colluricincla harmonica*	Grey Shrike-Thrush				x				X
Aves	Anatidae	*Anas gracilis*	Grey Teal				x	x			X
Aves	Scolopacidae	*Tringa brevipes*	Grey-Tailed Tattler		MI & P4	MI			x		
Aves	Anatidae	*Aythya australis*	Hardhead				x				X
Aves	Podicipedidae	*Poliocephalus poliocephalus*	Hoary-Headed Grebe				x				X
Aves	Petroicidae	*Melanodryas cucullata*	Hooded Robin				x	x			
Aves	Cuculidae	*Chalcites basalis*	Horsfield's Bronze-Cuckoo				x				X
Aves	Acanthizidae	*Acanthiza apicalis*	Inland Thornbill								X
Aves	Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra	x			x				X
Aves	Columbidae	*Spilopelia senegalensis*	Laughing Turtle-Dove				x				X
Aves	Phalacrocoracidae	*Phalacrocorax sulcirostris*	Little Black Cormorant				x				X
Aves	Cacatuidae	*Cacatua sanguinea*	Little Corella								x
Aves	Accipitridae	*Hieraaetus morphnoides*	Little Eagle				x				X
Aves	Ardeidae	*Egretta garzetta*	Little Egret				x				X

Class	Family	Scientific Name	Vernacular Name	Observed	WA Status	EPBC Status	ALA 2024	Danjoo 2024	DBCA 2024	PMST 2024	Birdata 2024
Aves	Locustellidae	*Poodytes gramineus*	Little Grassbird				X				X
Aves	Phalacrocoracidae	*Microcarbo melanoleucos*	Little Pied Cormorant				X				x
Aves	Scolopacidae	*Calidris subminuta*	Long-Toed Stint								x
Aves	Monarchidae	*Grallina cyanoleuca*	Magpie-Lark	x			X				X
Aves	Scolopacidae	*Tringa stagnatilis*	Marsh Sandpiper		MI	MI			X		
Aves	Tytonidae	*Tyto novaehollandiae novaehollandiae*	Masked Owl (Southwest)		P3		X	X	X		X
Aves	Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird				X				x
Aves	Anatidae	*Biziura lobata*	Musk Duck				X				x
	Aves	*Cairina moschata*	Muscovy Duck								X
Aves	Falconidae	*Falco cenchroides*	Nankeen Kestrel				X				X
Aves	Ardeidae	*Nycticorax caledonicus*	Nankeen Night-Heron				X				X
Aves	Meliphagidae	*Phylidonyris novaehollandiae*	New Holland Honeyeater				X	X			X
Aves	Pandionidae	*Pandion haliaetus*	Osprey		MI		X		X		X
Aves	Anatidae	*Anas superciliosa*	Pacific Black Duck				X				x
Aves	Petroicidae	*Petroica multicolor*	Pacific Robin				X				
Aves	Turnicidae	*Turnix varius*	Painted Button-Quail				X	X			X
Aves	Cuculidae	*Heteroscenes pallidus*	Pallid Cuckoo				X				X
Aves	Falconidae	*Falco peregrinus*	Peregrine Falcon		OS		X		X		X
Aves	Anatidae	*Malacorhynchus membranaceus*	Pink-Eared Duck				X				x
Aves	Rallidae	*Porphyrio porphyrio*	Purple Swamphen				X				x
Aves	Psittaculidae	*Parvipsitta porphyrocephala*	Purple-Crowned Lorikeet				X				X
Aves	Artamidae	*Cracticus nigrogularis*	Pied Butcherbird								X
Aves	Recurvirostridae	*Himantopus leucocephalus*	Pied Stilt								X
Aves	Meropidae	*Merops ornatus*	Rainbow Bee-Eater				X				X

Class	Family	Scientific Name	Vernacular Name	Observed	WA Status	EPBC Status	ALA 2024	Danjoo 2024	DBCA 2024	PMST 2024	Birdata 2024
Aves	Meliphagidae	*Anthochaera carunculata*	Red Wattlebird				x	x			X
Aves	Psittaculidae	*Purpureicephalus spurius*	Red-Capped Parrot	x			x	x			x
Aves	Petroicidae	*Petroica goodenovii*	Red-Capped Robin								x
Aves	Estrildidae	*Stagonopleura oculata*	Red-Eared Firetail								X
Aves	Recurvirostridae	*Recurvirostra novaehollandiae*	Red-Necked Avocet				x				X
Aves	Scolopacidae	*Calidris ruficollis*	Red-Necked Stint		MI	MI			x		X
Aves	Maluridae	*Malurus elegans*	Red-Winged Fairy-Wren								X
Aves	Paridae	*Acanthiza apicalis*	Red-Rumped Tit				x				
Aves	Psittaculidae	*Polytelis anthopeplus*	Regent Parrot				x				X
Aves	Monarchidae	*Myiagra inquieta*	Restless Flycatcher								x
Aves	Columbidae	*Columba livia*	Rock Dove				x				X
Aves	Locustellidae	*Cincloramphus mathewsi*	Rufous Songlark				x	x			
Aves	Climacteridae	*Climacteris rufus*	Rufous Treecreeper								x
Aves	Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler				x				X
Aves	Alcedinidae	*Todiramphus sanctus*	Sacred Kingfisher				x				X
Aves	Petroicidae	*Petroica boodang*	Scarlet Robin					x			X
Aves	Scolopacidae	*Calidris acuminata*	Sharp-Tailed Sandpiper		MI	MI			x	x	X
Aves	Cuculidae	*Chalcites lucidus*	Shining Bronze-Cuckoo				x				X
Aves	Laridae	*Chroicocephalus novaehollandiae*	Silver Gull				x				X
Aves	Zosteropidae	*Zosterops lateralis*	Silvereye	x			x	x			X
Aves	Meliphagidae	*Gavicalis virescens*	Singing Honeyeater				x	x			X
Aves	Percichthyidae	*Ninox novaeseelandiae*	Southern Boobook				x				X
Aves	Galaxiidae	*Malurus splendens*	Splendid Fairy-Wren				x	x			X
Aves	Accipitridae	*Circus assimilis*	Spotted Harrier								x

Class	Family	Scientific Name	Vernacular Name	Observed	WA Status	EPBC Status	ALA 2024	Danjoo 2024	DBCA 2024	PMST 2024	Birdata 2024
Aves	Myobatrachidae	*Pardalotus punctatus*	Spotted Pardalote				X				X
Aves	Myobatrachidae	*Lophoictinia isura*	Square-Tailed Kite				X				X
Aves	Myobatrachidae	*Threskiornis spinicollis*	Straw-Necked Ibis				X				X
Aves	Myobatrachidae	*Pardalotus striatus*	Striated Pardalote				X				x
Aves	Myobatrachidae	*Coturnix pectoralis*	Stubble Quail				X				
Aves	Limnodynastidae	*Cacatua galerita*	Sulphur-Crested Cockatoo				X				
Aves	Limnodynastidae	*Circus approximans*	Swamp Harrier				X				X
Aves	Pelodryadidae	*Podargus strigoides*	Tawny Frogmouth				X				X
Aves	Pelodryadidae	*Gliciphila melanops*	Tawny-Crowned Honeyeater				X	X			
Aves	Myobatrachidae	*Xenus cinereus*	Terek Sandpiper		MI	MI			X		
Aves	Migidae	*Petrochelidon nigricans*	Tree Martin	x			X				X
Aves	Idiopidae	*Daphoenositta chrysoptera*	Varied Sittella				X				X
Aves	Ardeidae	*Aquila audax*	Wedge-Tailed Eagle				X				X
Aves	Anhingidae	*Smicrornis brevirostris*	Weebill				X				X
Aves	Podicipedidae	*Hirundo neoxena*	Welcome Swallow				X				x
Aves	Anatidae	*Gerygone fusca*	Western Gerygone	x			X				X
Aves	Falconidae	*Platycercus icterotis*	Western Rosella	x			X				X
Aves	Artamidae	*Acanthorhynchus superciliosus*	Western Spinebill	x			X				X
Aves	Aegothelidae	*Acanthiza inornata*	Western Thornbill	x			X				X
Aves	Pelecanidae	*Anthochaera lunulata*	Western Wattlebird				X				X
Aves	Motacillidae	*Eopsaltria griseogularis*	Western Yellow Robin				X				X
Aves	Corvidae	*Haliastur sphenurus*	Whistling Kite				X				X
Aves	Petroicidae	*Quoyornis georgianus*	White-Breasted Robin								X

Class	Family	Scientific Name	Vernacular Name	Observed	WA Status	EPBC Status	ALA 2024	Danjoo 2024	DBCA 2024	PMST 2024	Birdata 2024
Aves	Psittaculidae	*Sericornis frontalis*	White-Browed Scrubwren	x			X	X			X
Aves	Anatidae	*Phylidonyris niger*	White-Cheeked Honeyeater				X				X
Aves	Threskiornithidae	*Egretta novaehollandiae*	White-Faced Heron				X				X
Aves	Anatidae	*Epthianura albifrons*	White-Fronted Chat				X	X			X
Aves	Columbidae	*Pterodroma lessonii*	White-Headed Petrel				X	X			
Aves	Scolopacidae	*Melithreptus lunatus*	White-Naped Honeyeater				X				x
Aves	Cacatuidae	*Ardea pacifica*	White-Necked Heron				X				x
Aves	Campephagidae	*Lalage tricolor*	White-Winged Triller								X
Aves	Ardeidae	*Rhipidura leucophrys*	Willie Wagtail	x			X				x
Aves	Anatidae	*Tringa glareola*	Wood Sandpiper		MI	MI			X		x
Aves	Campephagidae	*Platalea flavipes*	Yellow-Billed Spoonbill				X				x
Aves	Artamidae	*Acanthiza chrysorrhoa*	Yellow-Rumped Thornbill				X				x
Bivalvia	Charadriidae	*Westralunio carteri*	Carter's Freshwater Mussel		VU	VU			X		
Insecta	Accipitridae	*Pachysaga strobila*	Vasse Pachysaga (Busselton-Donnybrook)		P1				X		
Malacostraca	Recurvirostridae	*Engaewa pseudoreducta*	Margaret River Burrowing Crayfish			Critically Endangered				X	
Mammalia	Anatidae	*Isoodon obesulus fusciventer*	Quenda, Southwestern Brown Bandicoot		P4		X		X		
Mammalia	Falconidae	*Dasyurus geoffroii*	Chuditch, Western Quoll		VU	VU	X		X	X	
Mammalia	Accipitridae	*Hydromys chrysogaster*	Water-Rat		P4				X		
Mammalia	Meliphagidae	*Cercartetus concinnus*	Western Pygmy-Possum				X	X			
Mammalia	Locustellidae	*Notamacropus irma*	Western Brush Wallaby		P4		X		X		
Mammalia	Rallidae	*Bettongia penicillata ogilbyi*	Woylie		CR	EN			X		

Class	Family	Scientific Name	Vernacular Name	Observed	WA Status	EPBC Status	ALA 2024	Danjoo 2024	DBCA 2024	PMST 2024	Birdata 2024
Mammalia	Cacatuidae	*Falsistrellus mackenziei*	Western False Pipistrelle, Western Falsistrelle		P4				X		
Mammalia	Laridae	*Setonix brachyurus*	Quokka		VU	VU	X		X	X	
Mammalia	Ardeidae	*Felis catus*	Cat				X				
Mammalia	Cacatuidae	*Mus musculus*	House Mouse				X				
Mammalia	Columbidae	*Myrmecobius fasciatus*	Numbat			EN				X	
Mammalia	Scolopacidae	*Rattus rattus*	Black Rat				X				
Mammalia	Anatidae	*Vulpes vulpes*	Fox	x			X				
Mammalia	Scolopacidae	*Oryctolagus cuniculus*	Rabbit	x			X				
Mammalia	Columbidae	*Macropus fuliginosus*	Western Grey Kangaroo	x			X				
Mammalia	Laridae	*Phascogale tapoatafa wambenger*	South-Western Brush-Tailed Phascogale, Wambenger		CD				X		
Mammalia	Rallidae	*Pseudocheirus occidentalis*	Western Ringtail Possum, Ngwayir	x	CR	CR	X		X	X	
Petromyzontida	Artamidae	*Geotria australis*	Pouched Lamprey		P3				X		
Reptilia	Psittaculidae	*Anilios australis*	Southern Blind Snake				X	X			
Reptilia	Casuariidae	*Anilios pinguis*	Rotund Blind Snake				X				
Reptilia	Rallidae	*Christinus marmoratus*	Marbled Gecko				X				
Reptilia	Cuculidae	*Cryptoblepharus buchananii*	Buchanan's Snake-Eyed Skink				X	X			
Reptilia	Cacatuidae	*Ctenotus impar*	Odd-Striped Ctenotus				X	X			
Reptilia	Anatidae	*Egernia kingii*	King'S Skink				X				
Reptilia	Cacatuidae	*Elapognathus coronatus*	Western Crowned Snake				X				
Reptilia	Threskiornithidae	*Hemiergis gracilipes*	South-Western Mulch-Skink				X	X			
Reptilia	Pachycephalidae	*Hemiergis peronii tridactyla*	Four-Toed Earless Skink					X			

Class	Family	Scientific Name	Vernacular Name	Observed	WA Status	EPBC Status	ALA 2024	Danjoo 2024	DBCA 2024	PMST 2024	Birdata 2024
Reptilia	Phalacrocoracidae	*Hemiergis quadrilineata*	Two-Toed Earless Skink				x	x			
Reptilia	Ardeidae	*Lerista distinguenda*	South-Western Orange-Tailed Slider				x	x			
Reptilia	Artamidae	*Lerista elegans*	Elegant Slider				x				
Reptilia	Artamidae	*Lialis burtonis*	Burton's Snake-Lizard				x				
Reptilia	Falconidae	*Menetia greyii*	Grey's Menetia				x	x			
Reptilia	Rhipiduridae	*Morethia lineoocellata*	West Coast Morethia Skink				x				
Reptilia	Charadriidae	*Notechis scutatus*	Tiger Snake				x				
Reptilia	Pachycephalidae	*Pogona minor*	Dwarf Bearded Dragon				x				
Reptilia	Anatidae	*Tiliqua rugosa*	Shingle-Back				x				
Reptilia	Scolopacidae	*Varanus gouldii*	Sand Goanna				x	x			
Reptilia	Anatidae	*Varanus rosenbergi*	Heath Monitor				x				
Reptilia	Podicipedidae	*Pseudonaja affinis*	Dugite	x			x				

Appendix C.2 PMST database results

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	80
Listed Migratory Species:	47

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	3
Commonwealth Heritage Places:	None
Listed Marine Species:	68
Whales and Other Cetaceans:	13
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	7
Regional Forest Agreements:	1
Nationally Important Wetlands:	2
EPBC Act Referrals:	28
Key Ecological Features (Marine):	None
Biologically Important Areas:	5
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Vasse-wonnerup system	Within 10km of Ramsar site	In buffer area only

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
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area	In feature area
Clay Pans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area	In buffer area only
Empodisma peatlands of southwestern Australia	Endangered	Community likely to occur within area	In feature area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to 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
BIRD			
Anous tenuirostris melanops			
Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Ardenna grisea			
Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Botaurus poiciloptilus			
Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Phaethon rubricauda westralis Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Species or species habitat may occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding likely to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche cauta			
Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida			
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area
Zanda baudinii listed as Calyptorhynchus baudinii			
Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Breeding known to occur within area	In feature area
Zanda latirostris listed as Calyptorhynchus latirostris			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding known to occur within area	In feature area
CRUSTACEAN			
Engaewa pseudoreducta			
Margaret River Burrowing Crayfish [82674]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
FISH			
Nannatherina balstoni			
Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
MAMMAL			
Balaenoptera musculus			
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
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Myrmecobius fasciatus Numbat [294]	Endangered	Species or species habitat may occur within area	In feature area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In buffer area only
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Breeding known to occur within area	In feature area
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat known to occur within area	In feature area
OTHER			
Westralunio carteri Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat known to occur within area	In feature area
PLANT			
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area	In buffer area only
Banksia mimica Summer Honeypot [82765]	Endangered	Species or species habitat likely to occur within area	In feature area
Banksia nivea subsp. uliginosa Swamp Honeypot [82766]	Endangered	Species or species habitat likely to occur within area	In feature area
Banksia squarrosa subsp. argillacea Whicher Range Dryandra [82769]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Brachyscias verecundus Ironstone Brachyscias [81321]	Critically Endangered	Species or species habitat may occur within area	In feature area
Caladenia busselliana Bussell's Spider-orchid [24369]	Endangered	Species or species habitat known to occur within area	In buffer area only
Caladenia hoffmanii Hoffman's Spider-orchid [56719]	Endangered	Species or species habitat likely to occur within area	In feature area
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chamelaucium sp. S coastal plain (R.D.Royce 4872) Royce's Waxflower [87814]	Vulnerable	Species or species habitat known to occur within area	In feature area
Darwinia whicherensis Abba Bell [83193]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Daviesia elongata subsp. elongata Long-leaved Daviesia [64883]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Diuris drummondii Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat known to occur within area	In feature area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area	In buffer area only
Drakaea elastica Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat known to occur within area	In feature area
Gastrolobium papilio Butterfly-leaved Gastrolobium [78415]	Endangered	Species or species habitat likely to occur within area	In feature area
Grevillea maccutcheonii McCutcheon's Grevillea [64522]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Lambertia echinata subsp. occidentalis Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat may occur within area	In feature area
Morelotia australiensis listed as Tetraria australiensis Southern Tetraria [92784]	Vulnerable	Species or species habitat known to occur within area	In feature area
Petrophile latericola Laterite Petrophile [64532]	Endangered	Species or species habitat likely to occur within area	In feature area
Synaphea sp. Fairbridge Farm (D.Papenfus 696) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Synaphea sp. Pinjarra Plain (A.S.George 17182) [86878]	Endangered	Species or species habitat known to occur within area	In buffer area only
Synaphea sp. Serpentine (G.R.Brand 103) [86879]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Synaphea stenoloba Dwellingup Synaphea [66311]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Verticordia densiflora var. pedunculata](#) Long-stalked Featherflower [55689]	Endangered	Species or species habitat known to occur within area	In feature area
[Verticordia plumosa var. vassensis](#) Vasse Featherflower [55804]	Endangered	Species or species habitat likely to occur within area	In buffer area only
REPTILE			
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
SHARK			
[Carcharias taurus (west coast population)](#) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Carcharodon carcharias](#) White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
[Galeorhinus galeus](#) School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
[Pristis pristis](#) Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area	In buffer area only
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hydroprogne caspia Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Onychoprion anaethetus Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Marine Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharias taurus Grey Nurse Shark [64469]		Species or species habitat likely to occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Megaptera novaeangliae](#) Humpback Whale [38]		Congregation or aggregation known to occur within area	In buffer area only
[Mobula alfredi as Manta alfredi](#) Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In buffer area only
[Mobula birostris as Manta birostris](#) Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
[Pristis pristis](#) Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
[Rhincodon typus](#) Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Terrestrial Species			
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Calidris canutus](#) Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat likely to occur within area	In buffer area only
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
[Pandion haliaetus](#) Osprey [952]		Species or species habitat known to occur within area	In buffer area only
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [50394]	WA	In buffer area only
Commonwealth Land - [50395]	WA	In buffer area only
Commonwealth Land - [50435]	WA	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area	In buffer area only
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat likely to occur within area	In buffer area only
Macronectes giganteus 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
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Onychoprion anaethetus as Sterna anaethetus Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Puffinus assimilis Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Stercorarius antarcticus as Catharacta skua			
Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Thalassarche carteri			
Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta			
Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida			
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis			
Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Fish			
Acentronura australe			
Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In buffer area only
Campichthys galei			
Gale's Pipefish [66191]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In buffer area only
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area	In buffer area only
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In buffer area only
Hippocampus subelongatus West Australian Seahorse [66722]		Species or species habitat may occur within area	In buffer area only
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area	In buffer area only
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In buffer area only
Lissocampus fatiloquus Prophet's Pipefish [66250]		Species or species habitat may occur within area	In buffer area only
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
Mitotichthys meraculus Western Crested Pipefish [66259]		Species or species habitat may occur within area	In buffer area only
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In buffer area only
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In buffer area only
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In buffer area only
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In buffer area only
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In buffer area only
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In buffer area only
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area	In buffer area only
Mammal			
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Neophoca cinerea](#) Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In buffer area only
Reptile			
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
[Balaenoptera acutorostrata](#) Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
[Balaenoptera edeni](#) Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
[Balaenoptera musculus](#) Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Caperea marginata](#) Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
[Delphinus delphis](#) Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Congregation or aggregation known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Capel	Nature Reserve	WA	In buffer area only
NTWA Bushland covenant (0107)	Conservation Covenant	WA	In buffer area only
NTWA Bushland covenant (0175)	Conservation Covenant	WA	In buffer area only
Tuart Forest	National Park	WA	In buffer area only
Unnamed WA03249	Nature Reserve	WA	In feature area
Unnamed WA49857	Nature Reserve	WA	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Unnamed WA50190	Nature Reserve	WA	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
South West WA RFA	Western Australia	In feature area

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
McCarleys Swamp (Ludlow Swamp)	WA	In buffer area only
Vasse-Wonnerup Wetland System	WA	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Residential development Lot 71 Spurr St, Capel, WA	2019/8441		Completed	In buffer area only
Controlled action				
Bunbury Outer Ring Road Southern Section project, WA	2019/8543	Controlled Action	Final PD	In buffer area only
Bussell Highway - Capel to Hutton Section, WA	2015/7626	Controlled Action	Post-Approval	In buffer area only
Bussell Highway Duplication Hutton to Sabina	2020/8800	Controlled Action	Post-Approval	In buffer area only
Mining of titaninum mineral sands from four deposits located on both private la	2004/1628	Controlled Action	Completed	In feature area
Mining of titanium mineral sands in Happy Valley north and south, on private ...	2006/2597	Controlled Action	Completed	In feature area
Sand Extraction Project, Lot 1 Southwest Highway, Boyanup, WA	2015/7449	Controlled Action	Assessment Approach	In buffer area only
Sand mine	2008/4114	Controlled Action	Completed	In buffer area only
South Capel Remediation Project, WA	2018/8250	Controlled Action	Post-Approval	In buffer area only
Yarragadee Water Supply Development	2005/2073	Controlled Action	Completed	In feature area
Yoganup 215 mineral sands mine - Mining Lease 70/401	2007/3225	Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Not controlled action				
Clearing 5.4ha of native vegetation for sand extraction	2012/6592	Not Controlled Action	Completed	In buffer area only
Extension of commercial sand extraction operation, Shire of Capel WA	2003/1250	Not Controlled Action	Completed	In buffer area only
Extension of Existing Sand Mining Operations Yoganup West Mining Leases ML70/672	2003/1119	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
larvaciding of potential mosquito breeding wetlands	2006/2601	Not Controlled Action	Completed	In buffer area only
Titanium Mining	2001/340	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
McCourt Hills Estate Stage 3	2006/2760	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Stratham Park Estate Subdivision - Lots 70, 11 and 12	2008/4068	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Titanium mineral sands from M70/895 and M70/899	2005/2031	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Waterloo to Busselton 132kV Transmission Line	2002/816	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Widening of Ludlow North Road Between Peppermint Grove Road and Mallokup Road	2009/5242	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Referral decision				
Harvesting of Pinus Radiata Plantation	2010/5414	Referral Decision	Completed	In buffer area only
Residential development, Lot 71 Spurr Street, Capel, WA	2017/8128	Referral Decision	Completed	In buffer area only
Residential Subdivision, Location 871 Goodwood Rd and Lot 1181 Hawley Rd, Capel	2008/4090	Referral Decision	Completed	In buffer area only
Residential subdivision and development	2007/3711	Referral Decision	Completed	In buffer area only

Biologically Important Areas			[Resource Information]
Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging (in high numbers)	Known to occur	In buffer area only
Onychoprion anaethetus Bridled Tern [82845]	Foraging (in high numbers)	Known to occur	In buffer area only
Puffinus assimilis tunneyi Little Shearwater [59363]	Foraging (in high numbers)	Known to occur	In buffer area only
Whales			
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Migration	Known to occur	In buffer area only
Megaptera novaeangliae Humpback Whale [38]	Migration (south)	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 is 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 on the contents of this report.

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 point locations and environmental data layers.

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 when time permits.

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 breeding sites; and
- 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 D Threatened Fauna Evaluation

Table D.1 provides an evaluation of the presence of habitat and the likelihood of occurrence for conservation significant (target) fauna species within the Survey Area. The potential to be impacted depends on the nature of the impacts proposed, habitat utilised by the target species and the likelihood of occurrence. The presence of habitat is broken into four categories:

- **Present - core:** Potential or known habitat present within the Survey Area. Consists of "habitat critical to the survival of a species" which refers to core areas that are necessary for activities such as foraging, breeding, roosting, or dispersal, necessary for the long-term maintenance of the species to maintain genetic diversity and long-term evolutionary development (DoE, 2013) or habitat types recognised in Recovery Plans or guidelines.
- **Present - supporting:** Likely to provide dispersal, transitory or supporting habitat that may support core / critical habitat areas, such as small areas of lesser quality habitat where an animal has a large home range.
- **Marginal:** Habitat present is not typical but may be suitable, or habitat is typical, but condition and microhabitat requirements of species are not present.
- **Absent:** No potential or known habitat is present within the project area.

There are four categories for likelihood of occurrence:

- **Present:** Species was recorded during the field investigations.
- **Possible:** Suitable habitat present and the species could occur in the Survey Area based on the proximity of nearest records.
- **Unlikely:** Species known or predicted within the locality. Suitable habitat may be present in the Survey Area, but the proximity of nearest records suggests it is unlikely to occur.
- **Nil:** Species known or predicted to occur within the locality but no suitable habitat within the Survey Area.

Some fauna have been excluded as they are not relevant to the proposal or would not be impacted:

- Marine (e.g. seals, dolphins, whales, penguins).
- Marine migratory species (e.g. Albatrosses) or where breeding is in the northern hemisphere, e.g. marine Shorebirds and waders, e.g. Hooded plover, crested tern.
- Species considered regionally extinct or misidentified or outside of the animals known distribution (e.g. Bilby, Numbat and Woylie).

Some taxa associated with water courses were included (e.g. Carter's Freshwater Mussel, Pouched Lamprey, Margaret River Burrowing Crayfish, Blackstriped Dwarf Galaxias and Balston's Pygmy Perch), as the Survey Area was intersected by two watercourses (connected to Gyndup Brook) and occurred across three geomorphic wetland classifications, as mapped in the DBCA (2024) Geomorphic Wetlands, Swan Coastal Plain dataset.

Conservation status is as per the (federal) EPBC Act and (WA) DBCA Parks and Wildlife Service's Threatened and Priority Fauna List last updated April 2024. Refer to Appendix B for Conservation Codes.

Table D.1 Evaluation of the presence of habitat and the likelihood of occurrence for conservation fauna significant species within the Survey Area

Class	Family Genus species	Vernacular	Status Federal	Stat. WA	Requirements	Presence of habitat	Likelihood of occurrence
ACTINOPTERYGII	GALAXIIDAE *Galaxiella nigrostriata*	Black striped Dwarf Galaxias	–	EN	Habitat consists of acidic ephemeral wetlands of the south-west of Western Australia. Generally prefer sandy soils (has been shown to be more suited for burrowing). Has been documented to survive in both natural wetlands, as well as excavated roadside pools (these pools may be important in conserving the species) (DAWE, 2018). Restricted to Acidic peat swamps in the south-western corner of WA generally on conservation/managed land (between Augusta and Albany with outlying populations Page 12 of 20 at Kemerton, Melaleuca Park and near Muchea) (DAWE, 2018). Annually aestivate during the dry periods each year (DAWE, 2018).	Marginal	Unlikely. Not within the proposed road widening areas.
	PERCICHTHYIDAE *Nannatherina balstoni*	Balston's Pygmy Perch	VU	–	Known from a small area of coastal peat flats in south-western Western Australia that extends from Margaret River to Two Peoples Bay. Two additional populations have recently been found to the north of this area in the Collie River and the Moore River (Morgan et al., 1998). In winter and spring Balston's Pygmy Perch is typically found among inundated riparian vegetation where it presumably feeds and spawns. In summer, Balston's Pygmy Perch has been found to be moderately abundant in pools and creeks that often dry up, such as those found between Windy Harbour and Walpole (Morgan et al., 1998)(Morgan et al., 1998).	Absent	Nil. Not within the proposed road widening areas.
AVES	ANATIDAE *Oxyura australis*	Blue-Billed Duck	–	P4	Deep, densely vegetated freshwater lakes, swamps when breeding; winters on more open waters (Morcombe, 2011).	Absent	Nil
	Botaurus poiciloptilus	Australasian Bittern	EN	EN	The Australasian Bittern occurs in terrestrial freshwater wetlands and, rarely, estuarine habitats. In the south-west it is found in beds of tall rush mixed with, or near, short fine sedge or open pools. The species also occurs around swamps, lakes, pools, rivers and channels fringed with lignum (*Muehlenbeckia* sp.), canegrass (*Eragrostis* sp.) or other dense vegetation. The species occasionally ventures into areas of open water or onto banks. In the SW WA, it is confined to a relatively small number of regularly occupied locations. These locations probably number less than 70, including:	Absent	Nil

Class	Family Genus species	Vernacular	Status Federal	Stat. WA	Requirements	Presence of habitat	Likelihood of occurrence
					less than five north of Perth; less than 10 in the greater Perth metropolitan area; less than 10 south to Busselton; less than 10 in the Lake Muir district; less than 10 from Augusta to Walpole; less than 10 around Albany; and less than 10 around Esperance and Cape Arid. Most of these sites are discrete basin/sumpland wetlands with local catchments, and many depend on the surface expression of groundwater (SPRAT, n.d.).		
	Ixobrychus flavicollis australis	Black Bittern (Southwest Subpopulation)	–	P2	Found in both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation, e.g. shadowy leafy waterside trees: casurinas, eucalypts, paperbarks, tidal creeks and mudflats. In the case that permanent water is present, the species may also occur in flooded grassland or adjacent forest and woodland. It nests on a sheltered horizontal branch over water (Pizzey & Knight, 2007).	Absent	Nil
	CACATUIDAE *Calyptorhynchus banksii naso*	Forest Red-Tailed Black Cockatoo	VU	VU	The Forest Red-tailed Black Cockatoo inhabits the dense Jarrah, Karri and Marri forests receiving more than 600 mm rainfall annually (SPRAT, n.d.). The FRTBC occurs within the same habitat as the Baudin's Cockatoo. FRTBC nest in Jarrah, Karri, Marri and Wandoo favouring large top entry hollows with entrances ranging over 12 cm in diameter and hollow depth one to five metres) (Johnstone et al., n.d.; SEWPaC, 2012). It breeds between February to December (with a peak between October and December, also a peak in some years in April–May) probably every two years (Johnson and Kirkby, Undated). The species predominately feeds on seeds from Marri and Jarrah fruits and Blackbutt, Albany Blackbutt, Forest Sheoak, Snottygobble and the non-indigenous native Spotted Gum and Cape Lilac within its home range of about 116-187 ha (SPRAT, n.d.). Observed on site.	Present -core	Present
	Zanda baudinii	Baudins Cockatoo	EN	EN	Baudin's Cockatoo is mainly found in eucalypt forests, especially Jarrah-Marri Forest, Karri Forest, and less frequently in woodlands of Wandoo, Blackbutt, Flooded Gum Yate, partly cleared farmlands and urban areas including roadside trees and house gardens. This cockatoo forages at all levels of the forest from the canopy to the ground, often feeding in the understorey on proteaceous trees and shrubs, especially Banksia, and in orchards both in trees and on dropped or fallen fruit on the ground (Johnstone et al., n.d.).	Present - core	Possible

Class	Family Genus species	Vernacular	Status Federal	Stat. WA	Requirements	Presence of habitat	Likelihood of occurrence
					Preferred roosts are in areas with a dense canopy close to permanent sources of water (SPRAT, n.d.). The range of the species during the non-breeding season (breeds in August though to late December) may be determined by the distribution of Marri, and that nesting might be confined to areas in which Karri occurs (SPRAT, n.d.). It is known to nest in hollows of Eucalypts usually at some height (Pizzey & Knight, 2007), often 30-50m above ground (Jupp, 2000). Tree hollows usually have an entrance of 30-40cm, >30cm deep and are mostly vertical (Johnstone et al., n.d.; SPRAT, n.d.). Some local records, no evidence on site.		
	Zanda latirostris	Carnabys Cockatoo	EN	EN	This species is a postnuptial nomad, moving west after breeding. Carnaby's Cockatoo mainly occurs in or near eucalypt woodlands, especially those dominated by Wandoo or Salmon Gum, and sometimes reported in forests of Marri, Jarrah, Karri and Tuart. Nesting hollows may be located anywhere from 2 m to >10 m from ground, mainly in the Wheatbelt (Cale, 2003; SPRAT, n.d.; WA Museum, 2010). It is known to forage in native shrubland, kwongan heathland and woodland dominated by proteaceous plant species such as Banksia spp. (including Dryandra spp.), Hakea spp. and Grevillea spp. Forages in pine plantations, eucalypt woodland and forest that contains foraging species. Also individual trees and small stands of these species (SEWPaC, 2012). Breeding occurs mainly from early July to mid-December. Breeding success is largely dependent on suitable feeding habitat adjacent to the nest site to provide the necessary food for the survival of the chick, for example adjacent pine forest or remnant vegetation (Johnstone et al., n.d.). Some local records, no evidence on site.	Present - core	Possible
	FALCONIDAE *Falco hypoleucos*	Grey Falcon	VU	–	Frequents timbered lowland plains, particularly *Acacia* shrublands that are crossed by tree-lined water courses (Garnett et al., 2011; Ley & Tynan, 2016; Schoenjahn, 2013, 2018; Watson, 2011). Has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter (P. D. Olsen & Olsen, 1986; Schoenjahn, 2018).	Present - supporting	Unlikely
	Falco peregrinus	Peregrine Falcon	–	OS	Peregrine Falcons occur in woodland, plains, gorges, wetlands but tend to breed either in stick-nests in trees or nest on cliff ledges. It	Present - supporting	Possible

Class	Family Genus species	Vernacular	Status Federal	Stat. WA	Requirements	Presence of habitat	Likelihood of occurrence
					appears that hollows and large abandoned nests of other birds may be used where cliff ledges are limited. Breeds Aug-Dec. Where good habitat occurs, and the density of Peregrine Falcons is high, active nests may occur within 2.5km of each other. The diet of the Peregrine Falcon includes wood duck, pigeons and doves, galahs, rosellas and cockatoo, starlings and larks (J. Olsen et al., 2006).		
	TYTONIDAE *Tyto novaehollandiae novaehollandiae*	Masked Owl (Southwest)	–	P3	Inhabits forests, open woodlands and farmlands with large trees, including timber watercourses paperbark woodlands. Widespread but very sparse, they breed any time of the year when conditions are favourable with a nesting period of about three months (Pizzey & Knight, 2007).	Present - supporting	Unlikely
INVERTEBRATES	HYRIIDAE *Westralunio carteri*	Carter's Freshwater Mussel	VU	VU	Patchily distributed in sandy/muddy sediments of freshwater lakes, rivers and streams with greatest densities associated with woody debris and overhanging riparian vegetation near stream banks and edges of lakes/dams (DAWE, 2017). Adults mostly sessile, but do move through sediments with a muscular foot, creating visual tracks; Juveniles much more mobile, moving in a similar fashion as a caterpillar (DAWE, 2017). When in burrowed, filter-feeding position, siphons extended, mantle and siphons have a mottled red/black appearance; inhalant siphon lined with papillae (DAWE, 2017).	Absent	Unlikely. Not within the proposed road widening areas.
	MIGIDAE *Bertmainius opimus*	Western pygmy trapdoor spider	-	P3	This trapdoor spider is a short range endemic, occurs locally within State Forest. The spiders construct shallow burrows on the bark of tingle trees (*Eucalyptus guilfoylei, E. jacksonii* and *E. brevistylis*) or in soil on the banks of creek lines and gullies. The burrows are capped with a thin lid that serves to retain moisture and keep out predators such as ants. The lids are sealed with silk when the spiders moult, or when eggs or juveniles are in the burrow with the female. The spiders seem to prefer moist, shaded areas. Burrows are often clustered in appropriate microhabitats. Life history information is limited, and the age structure of the populations is unknown. However, most mygalomorph spiders are relatively long lived (>5 years) (Harvey eta l 2015). No nearby DBCA records.	Marginal	Unlikely

Class	Family Genus species	Vernacular	Status Federal	Stat. WA	Requirements	Presence of habitat	Likelihood of occurrence
	IDIOPIDAE *Idiosoma sigillatum*	Swan Coastal Plain Trapdoor Spider	-	P3	Lives in remnant woodland on the Swan Coastal Plan, using sheoak needles to make a rim around the burrow (Rix et al 2018). There are no local DBCA records (within 10 km).	Absent	Unlikely
	PARASTACIDAE *Engaewa pseudoreducta*	Margaret River Burrowing Crayfish	CR	–	Habitat for the Margaret River Burrowing Crayfish is in the narrow creek tributaries of the Margaret River which are densely vegetated on heavy grey/yellow clay soils (Burnham et al., 2007). Associated vegetation includes tall tea-trees (Melaleuca sp.) and eucalypts (Eucalyptus spp.). In these soils, Margaret River Burrowing Crayfish construct a complex burrow system that can be several metres deep, extending down to the freshwater water table in drier months. At wetter times of year burrows are marked by conspicuous chimneys of soil pellets (DAWE, 2009).	Absent	Unlikely. Not within the proposed road widening areas.
	TETTIGONIIDAE Pachysaga strobila	Vasse Pachysaga	-	P1	The Vasse Pachysaga is known only from its type specimen with attempts to locate more all unsuccessful. Found near Vasse, the large, cumbersome Vasse Pachysaga is a relatively large component of the katydid fauna, mostly confined to the southern half of the continent in heath or mixed woodland. *P. strobila* is the most unusual of its genus in that it lacks a hind wing. All other Pachysaga species have either a distinctive red, yellow or grey hind wing (http://theconversation.com/australian-endangered-species-katydids-12938, accessed 2015).	Absent	Unlikely
MAMMALIA	DASYURIDAE *Dasyurus geoffroii*	Chuditch, Western Quoll	VU	VU	Quolls may occupy a range of habitats including forest, woodland and desert, though in the SW they are largely restricted to Jarrah forest or scattered through the southern and eastern wheat belt (DEC, 2010). Current records indicated that this only represents approximately 5% of their former range. Habitat critical to Western Quoll are large areas of undisturbed habitat which a sufficient variety of key food and other resources such as large hollow logs, burrows or small caves at ground level for denning. To be suitable as den sites, logs must have a diameter of at least 30 cm but usually greater than 50 cm, a hollow diameter of 7–20 cm and generally 1m long (Orell & Morris, 1994). Annually, an adult female Chuditch will utilise an estimated average of 66 logs and 110 burrows within her	Present - supporting	Unlikely

Class	Family Genus species	Vernacular	Status Federal	Stat. WA	Requirements	Presence of habitat	Likelihood of occurrence
					home range. A large amount of den sites is required for both sexes. They occupy relatively large home ranges, with males utilizing over 15 km2 and females, 3-4 km^2 (Orell & Morris, 1994).		
	MACROPODIDAE *Setonix brachyurus*	Quokka	VU	VU	"The understorey structure of the habitats currently used by Quokka consist of dense, low vegetation that provides refuge from predation (Hayward, 2002). The mainland habitats include dense riparian vegetation (Hayward et al., 2005), but additionally (from SPRAT (n.d.)) • heath and shrubland, • Swamp Peppermint (*Taxandria linearifolia*) dominated swamps in Jarrah forest, • swampy shrublands, • swordgrass-dominated understorey, • regrowth areas of the Karri forest, • Bullich swamp forest, • Paperbark (*Melaleuca* spp.) swamp. A low density of near-surface fuel, a complex vegetation structure and a varied fire-age mosaic best predict the probability of occupancy of quokka in the southern forest (DEC, 2013). The Bullich swamp forest in the drainage line in the southern site has similarities to southern forest habitats. No local recent records, probably locally extinct.	Absent	Nil
	MURIDAE *Notamacropus irma*	Western Brush Wallaby		P4	Optimum habitat for the Western Brush Wallaby includes open Jarrah forest or woodland and seasonally wet flats with low grasses and scrubby thickets, but also areas of mallee and heathland. Common dietary flora includes *Carpobrotus edulis*, *Cynodon dactylon* and *Nuytsia floribunda* (DEC, 2012). Needs large areas of habitat	Present - supporting	Unlikely
	Hydromys chrysogaster	Water-Rat		P4	The Water rat is usually found in permanent fresh or brackish water but can be found in marine environments. Fresh water habitats include swamps, lakes, dams even urban drainage swamps. Typically forages close to the shoreline, restricting its movements to shallow water (up to 2 m in depth) (CSIRO, 2004).	Marginal	Unlikely. Not within the proposed road widening areas.

Class	Family Genus species	Vernacular	Status Federal	Stat. WA	Requirements	Presence of habitat	Likelihood of occurrence
	PERAMELIDAE *Isoodon obesulus fusciventer*	Quenda, Southwestern Brown Bandicoot		P4	Bandicoot habitat consists of dense scrubby, often swampy vegetation with a dense cover up to one metre high particularly near watercourses/wetlands. It often feeds in adjacent forest (Jarrah and Wandoo) and woodlands that are burnt on a regular basis. Nests can be concealed next to or under old logs, shrubs or piles of debris and are made up of ground litter piled up over a shallow depression providing internal chambers. Home ranges vary with population density and range from 5-8.6 ha for males and 1-6 ha for females (DEC, 2010). Feed on a variety of ground-dwelling invertebrates and the fruit-bodies of hypogeous fungi. Their searches for food often create distinctive conical holes in the soil (DBCA, n.d.). No evidence observed.	Present - supporting	Possible
	PSEUDOCHEIRIDAE *Pseudocheirus occidentalis*	Western Ringtail Possum	CR	CR	In dense, coastal Peppermint forest, home ranges are about 0.5 hectares to 1.5 ha and in eucalypt forests about 2.5 ha. In the northern jarrah forests, home ranges are larger and have been recorded to at least 5.6 ha. Peppermint leaves form the basis of the WRP diet in coastal areas (between 79-100% based on a study of WRP near Busselton by Jones et al. (1994), but when unavailable, the dominant myrtaceous species are preferred. In the inland forest, Jarrah and Marri the main food source. Garden plant varieties are also exploited in urban areas. WRP use a range of nest and shelter sites to avoid predators and exposure to the weather. Dreys are constructed in the canopy if hollows are not available. Adequate nest and shelter sites are necessary components of good quality habitat (Jones et al., 1994; Shedley & Williams, 2014).	Present -core	Present
	STRIGIDAE *Phascogale tapoatafa wambenger*	South-Western Brush-Tailed Phascogale, Wambenger		CD	This arboreal species is found in a variety of forest types. Ideal habitat for this species consists of dry sclerophyll forest and open woodland (Jarrah, Marri, and mixed Jarrah Karri) that contain hollow bearing trees and sparse ground cover. Their many nesting sites include hollow tree limbs, rotten stumps and even birds' nests. Lactating females prefer a large tree cavity with a small entrance with a nest made of bark, feathers and fur. A female's home range covers 20 to 70 hectares, a male's home range overlaps females and increases during breeding season. It is predominantly carnivorous, foraging on arthropods, invertebrates, small vertebrates and nectar (Strahan, 1995).	Present - supporting	Possible

Class	Family Genus species	Vernacular	Status Federal	Stat. WA	Requirements	Presence of habitat	Likelihood of occurrence
	VESPERTILIONIDAE *Falsistrellus mackenziei*	Western False Pipistrelle, Western Falsistrelle		P4	It occurs in wet sclerophyll forest dominated by Karri (*Eucalyptus diversicolor*), and in the high rainfall zones of the Jarrah (*E. marginata*) and Tuart (*E. gomphocephala*) forests. It has also been recorded in mixed Tuart-Jarrah tall woodlands on the adjacent coastal plain. Marri (*E. calophylla*), Sheoak (*Allocasuarina heugeliana*) and Peppermint (*Agonis flexuosa*) trees are often co-dominant at its collection localities. This species roosts in tree hollows (Australian Museum, 2020) in colonies of 5 to 30 bats. The species feed on flying insects between below the forest canopy. No local records.	Marginal	Unlikely
PETROMYZONTIDA	ARTAMIDAE *Geotria australis*	Pouched Lamprey		P3	The species is anadromous (enters rivers from the ocean to spawn). Sub-adults enter freshwater rivers during winter and spring, moving upstream prior to spawning in the following year. Large numbers of lamprey can sometimes be seen below barriers (natural and artificial), as they are held up during migration. Their oral disc (sectorial) allow them to climb vertical obstacles, such as rock bars, waterfalls and weirs (DWER, 2025).	Nil	Nil

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Appendix E Black Cockatoo Foraging Plants

Table E.1 Flora taxa within the Survey Area with potential for quality black cockatoo foraging value

Species	Common name	Habit	Baudin's cockatoo	Carnaby's cockatoo	FRTBC	Reference
Acacia saligna	Orange Wattle	Tree		Secondary		(Groom, 2011; Valentine & Stock, 2008)
Agonis flexuosa	Peppermint Tree	Tree		Secondary		(Groom, 2011; Valentine & Stock, 2008)
Allocasuarina humilis	Sheoak	Tree		Secondary	Secondary	(DoEE, 2017; Groom, 2011; Johnstone et al., n.d., 2010b, 2010c; SEWPaC, 2012)
Banksia attenuata	Slender Banksia	Tree	Secondary	Primary		(Birds Australia, n.d.; DoEE, 2017; Groom, 2011; Johnstone et al., n.d., 2010a, 2010b; Saunders, 1979; Valentine & Stock, 2008)
Corymbia calophylla	Marri	Tree	Primary	Primary	Primary	(DoEE, 2017; Johnstone et al., n.d., 2010a, 2010b, 2010c, 2017; Johnstone & Kirkby, 1999, 2008; Johnstone & Storr, 1998; Saunders, 1979; SEWPaC, 2012; Valentine & Stock, 2008)
Eucalyptus marginata	Jarrah	Tree	Secondary	Primary	Primary	(Birds Australia, n.d.; DoEE, 2017; Groom, 2011; Johnstone et al., n.d., 2010a, 2010b, 2010c, 2017; Johnstone & Kirkby, 1999; Johnstone & Storr, 1998; Saunders, 1979; SEWPaC, 2012; Valentine & Stock, 2008)

Hakea varia	Variable-leaved Hakea	Tall shrub	Secondary	Primary		(Birds Australia, n.d.; Groom, 2011; Saunders, 1979; Valentine & Stock, 2008)
Jacksonia furcellata	Grey Stinkwood	Medium or small shrub		Secondary		(Groom, 2011)
Kingia australis	Kingia	Tree-like monocot	Secondary			(Johnstone et al., n.d.)
Persoonia longifolia	Snottygobble	Tree or shrub		Primary	Secondary	(DoEE, 2017; Johnstone et al., n.d.; Johnstone & Kirkby, 1999; Johnstone & Storr, 1998; SEWPaC, 2012; Valentine & Stock, 2008)
Xylomelum occidentale	Woody Pear	Tree or tall shrub		Secondary	Secondary	(Groom 2011, S. Priddle pers obs.)
**Erodium cicutarium* (foraging quality rating based on *Erodium* spp.)		Herb	Secondary	Secondary		(DoEE, 2017; Johnstone et al., n.d.; Valentine & Stock, 2008)
**Lupinus angustifolius* (foraging quality rating based on *Lupinus* spp. in general)	Lupin	Herb		Secondary		(Groom, 2011; Saunders, 1979)

*Indicates flora taxa that are introduced/alien to the area.

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Appendix F Tree Survey Results

ID	Species	DBH (cm)	Comments	Hollows	Size	Type	Height	Note	Latitude (GDA94)	Longitude
1	Marri	55	Suitable DBH no hollows						115.574023	-33.544880
2	Marri	50	Suitable DBH no hollows						115.583100	-33.546639
3	Marri	70	Suitable DBH no hollows						115.584621	-33.546618
4	Marri	55	Suitable DBH no hollows						115.585045	-33.546625
5	Marri	60	Suitable DBH no hollows						115.590128	-33.546638
6	Marri	65	Suitable DBH no hollows						115.590279	-33.546628
7	Marri	85	Suitable DBH no hollows						115.590384	-33.546615
8	Marri	50	Suitable DBH no hollows						115.590384	-33.546615
9	Marri	55	Suitable DBH no hollows						115.591292	-33.546632
10	Marri	90	Suitable DBH no hollows						115.592049	-33.546632
11	Marri	65	Suitable DBH no hollows						115.596484	-33.546629
12	Marri	60	Suitable DBH no hollows						115.597469	-33.546634
13	Marri	50	Suitable DBH no hollows						115.598399	-33.546634
14	Marri	50	Suitable DBH no hollows						115.598399	-33.546634
15	Marri	80	Suitable DBH no hollows						115.598717	-33.546628
16	Marri	70	Suitable DBH no hollows						115.598712	-33.546640
17	Marri	50	Suitable DBH no hollows						115.598712	-33.546640
18	Marri	50	Suitable DBH no hollows						115.598872	-33.546641
19	Marri	60	Suitable DBH no hollows						115.599960	-33.546651
20	Marri	65	Suitable DBH no hollows						115.600598	-33.546636
21	Marri	70	Suitable DBH no hollows						115.604550	-33.546650
22	Marri	60	Suitable DBH no hollows						115.605189	-33.546660
23	Marri	55	Suitable DBH no hollows						115.605189	-33.546660
24	Marri	70	Suitable DBH no hollows						115.605189	-33.546660
25	Marri	55	Suitable DBH no hollows						115.605189	-33.546660
26	Marri	90	Suitable DBH no hollows						115.605841	-33.546659
27	Marri	60	Suitable DBH no hollows						115.613535	-33.546684

ID	Species	DBH (cm)	Comments	Hollows	Size	Type	Height	Note	Latitude (GDA94)	Longitude
28	Marri	60	Suitable DBH no hollows						115.615891	-33.546701
29	Marri	50	Suitable DBH no hollows						115.615953	-33.546702
30	Dead	60	Suitable DBH no hollows						115.617737	-33.546703
31	Dead	60	Suitable DBH no hollows						115.618171	-33.546705
32	Marri	65	Suitable DBH no hollows						115.620557	-33.546686
33	Marri	55	Suitable DBH no hollows						115.620591	-33.546692
34	Marri	65	Suitable DBH no hollows						115.624837	-33.546711
35	Marri	50	Suitable DBH no hollows						115.625018	-33.546704
36	Marri	50	Suitable DBH no hollows						115.625163	-33.546698
37	Marri	75	Suitable DBH no hollows						115.627503	-33.546705
38	Marri	60	Suitable DBH no hollows						115.628358	-33.546711
39	Marri	50	Suitable DBH no hollows						115.628358	-33.546711
40	Marri	60	Suitable DBH no hollows						115.628358	-33.546711
41	Marri	80	Suitable DBH no hollows						115.635443	-33.546705
42	Marri	50	Suitable DBH no hollows						115.635767	-33.546697
43	Marri	70	Suitable DBH no hollows						115.637120	-33.546720
44	Marri	80	Suitable DBH no hollows						115.637131	-33.546718
45	Marri	70	Suitable DBH no hollows						115.639948	-33.546721
46	Marri	60	Suitable DBH no hollows						115.650506	-33.546721
47	Marri	80	Suitable DBH no hollows						115.657167	-33.546760
48	Marri	75	Suitable DBH no hollows						115.660871	-33.546762
49	Dead	65	Suitable DBH no hollows						115.660871	-33.546762
50	Marri	85	Suitable DBH no hollows						115.660997	-33.546764
51	Marri	50	Suitable DBH no hollows						115.661315	-33.546757
52	Dead	50	Suitable DBH no hollows						115.661315	-33.546757
53	Marri	90	Suitable DBH no hollows						115.661868	-33.546759
54	Marri	60	Suitable DBH no hollows						115.661868	-33.546759

ID	Species	DBH (cm)	Comments	Hollows	Size	Type	Height	Note	Latitude (GDA94)	Longitude
55	Marri	60	Suitable DBH no hollows						115.667141	-33.546768
56	Marri	80	Suitable DBH no hollows						115.670104	-33.546814
57	Unknown	85	Suitable DBH no hollows						115.667475	-33.546812
58	Unknown	85	Suitable DBH no hollows						115.667139	-33.546825
59	Unknown	90	Suitable DBH no hollows						115.667139	-33.546825
60	Bluegum	90	Suitable DBH no hollows						115.662672	-33.546799
61	Bluegum	100	Suitable DBH no hollows						115.662672	-33.546799
62	Marri	85	Suitable DBH no hollows						115.661603	-33.546812
63	Marri	65	Suitable DBH no hollows						115.661603	-33.546812
64	Marri	55	Suitable DBH no hollows						115.661013	-33.546819
65	Marri	50	Suitable DBH no hollows						115.660286	-33.546806
66	Marri	50	Suitable DBH no hollows						115.660286	-33.546806
67	Marri	60	Suitable DBH no hollows						115.660199	-33.546804
68	Marri	60	Suitable DBH no hollows						115.660059	-33.546807
69	Marri	60	Suitable DBH no hollows						115.660018	-33.546802
70	Marri	55	Suitable DBH no hollows						115.659715	-33.546813
71	Marri	55	Suitable DBH no hollows						115.659577	-33.546812
72	Marri	75	Suitable DBH no hollows						115.659480	-33.546813
73	Marri	50	Suitable DBH no hollows						115.656759	-33.546801
74	Marri	80	Suitable DBH no hollows						115.656469	-33.546791
75	Jarrah	70	Suitable DBH no hollows						115.656430	-33.546792
76	Marri	65	Suitable DBH no hollows						115.656217	-33.546797
77	Marri	50	Suitable DBH no hollows						115.656217	-33.546797
78	Marri	50	Suitable DBH no hollows						115.656066	-33.546790
79	Marri	70	Suitable DBH no hollows						115.656066	-33.546790
80	Marri	65	Suitable DBH no hollows						115.655873	-33.546797
81	Marri	60	Suitable DBH no hollows						115.655615	-33.546796

ID	Species	DBH (cm)	Comments	Hollows	Size	Type	Height	Note	Latitude (GDA94)	Longitude
82	Marri	65	Suitable DBH no hollows						115.655124	-33.546781
83	Marri	55	Suitable DBH no hollows						115.654779	-33.546777
84	Marri	55	Suitable DBH no hollows						115.654707	-33.546785
85	Marri	55	Suitable DBH no hollows						115.654586	-33.546792
86	Marri	60	Suitable DBH no hollows						115.654560	-33.546790
87	Marri	55	Suitable DBH no hollows						115.653622	-33.546788
88	Marri	55	Suitable DBH no hollows						115.653622	-33.546788
89	Marri	50	Suitable DBH no hollows						115.653622	-33.546788
90	Marri	50	Suitable DBH no hollows						115.653471	-33.546789
91	Marri	50	Suitable DBH no hollows						115.652317	-33.546799
92	Marri	55	Suitable DBH no hollows						115.651957	-33.546797
93	Marri	55	Suitable DBH no hollows						115.651790	-33.546796
94	Marri	50	Suitable DBH no hollows						115.651690	-33.546786
95	Marri	50	Suitable DBH no hollows						115.651451	-33.546786
96	Marri	50	Suitable DBH no hollows						115.649488	-33.546777
97	Marri	50	Suitable DBH no hollows						115.649094	-33.546772
98	Marri	55	Suitable DBH no hollows						115.648399	-33.546789
99	Marri	65	Suitable DBH no hollows						115.648399	-33.546789
100	Marri	60	Suitable DBH no hollows						115.643571	-33.546764
101	Marri	65	Suitable DBH no hollows						115.643571	-33.546764
102	Marri	50	Suitable DBH no hollows						115.640786	-33.546739
103	Marri	55	Suitable DBH no hollows						115.640463	-33.546750
104	Marri	55	Suitable DBH no hollows						115.640463	-33.546750
105	Dead	80	Unsuitable hollow	1	10 to 15cm	Vertical	to 10m	No evidence of use, blocked, debris	115.640080	-33.546787
106	Marri	50	Suitable DBH no hollows						115.639939	-33.546737
107	Marri	50	Suitable DBH no hollows						115.639819	-33.546739
108	Marri	70	Suitable DBH no hollows						115.639819	-33.546739

ID	Species	DBH (cm)	Comments	Hollows	Size	Type	Height	Note	Latitude (GDA94)	Longitude
109	Marri	50	Suitable DBH no hollows						115.639819	-33.546739
110	Marri	70	Suitable DBH no hollows						115.639586	-33.546735
111	Marri	55	Suitable DBH no hollows						115.639586	-33.546735
112	Marri	80	Suitable DBH no hollows						115.639567	-33.546749
113	Marri	60	Suitable DBH no hollows						115.639312	-33.546763
114	Marri	50	Suitable DBH no hollows						115.639312	-33.546763
115	Marri	60	Suitable DBH no hollows						115.638916	-33.546760
116	Marri	60	Suitable DBH no hollows						115.638916	-33.546760
117	Marri	60	Suitable DBH no hollows						115.638916	-33.546760
118	Marri	50	Suitable DBH no hollows						115.637109	-33.546729
119	Marri	50	Suitable DBH no hollows						115.637109	-33.546729
120	Marri	55	Suitable DBH no hollows						115.637018	-33.546744
121	Marri	50	Suitable DBH no hollows						115.636782	-33.546735
122	Marri	55	Suitable DBH no hollows						115.636278	-33.546729
123	Marri	70	Suitable DBH no hollows						115.635664	-33.546732
124	Marri	50	Suitable DBH no hollows						115.635243	-33.546727
125	Marri	55	Suitable DBH no hollows						115.634976	-33.546722
126	Marri	50	Suitable DBH no hollows						115.634494	-33.546734
127	Marri	55	Suitable DBH no hollows						115.634229	-33.546718
128	Marri	50	Suitable DBH no hollows						115.634102	-33.546712
129	Marri	55	Suitable DBH no hollows						115.634102	-33.546712
130	Marri	55	Suitable DBH no hollows						115.633094	-33.546730
131	Marri	50	Suitable DBH no hollows						115.633036	-33.546747
132	Marri	50	Suitable DBH no hollows						115.631468	-33.546745
133	Marri	50	Suitable DBH no hollows						115.631460	-33.546741
134	Marri	75	Suitable DBH no hollows						115.631358	-33.546743
135	Marri	55	Suitable DBH no hollows						115.630610	-33.546744

ID	Species	DBH (cm)	Comments	Hollows	Size	Type	Height	Note	Latitude (GDA94)	Longitude
136	Marri	75	Suitable DBH no hollows						115.630476	-33.546746
137	Marri	50	Suitable DBH no hollows						115.630237	-33.546733
138	Marri	50	Suitable DBH no hollows						115.629980	-33.546726
139	Marri	55	Suitable DBH no hollows						115.629541	-33.546739
140	Marri	60	Suitable DBH no hollows						115.632956	-33.546745
141	Marri	50	Suitable DBH no hollows						115.629210	-33.546742
142	Marri	50	Suitable DBH no hollows						115.629100	-33.546742
143	Marri	50	Suitable DBH no hollows						115.629027	-33.546743
144	Marri	60	Suitable DBH no hollows						115.628484	-33.546760
145	Marri	70	Suitable DBH no hollows						115.628372	-33.546753
146	Marri	50	Suitable DBH no hollows						115.627352	-33.546744
147	Marri	50	Suitable DBH no hollows						115.627352	-33.546744
148	Marri	60	Suitable DBH no hollows						115.627352	-33.546744
149	Marri	60	Suitable DBH no hollows						115.626748	-33.546742
150	Marri	60	Suitable DBH no hollows						115.626748	-33.546742
151	Marri	70	Suitable DBH no hollows						115.626676	-33.546716
152	Marri	50	Suitable DBH no hollows						115.626224	-33.546721
153	Marri	50	Suitable DBH no hollows						115.625947	-33.546732
154	Marri	60	Suitable DBH no hollows						115.625947	-33.546732
155	Marri	50	Suitable DBH no hollows						115.625947	-33.546732
156	Marri	55	Suitable DBH no hollows						115.625647	-33.546737
157	Dead	55	Suitable DBH no hollows						115.625492	-33.546730
158	Marri	100	Unsuitable hollow	1	to 10cm	Knot angle suitable	to 10m	Too small, bees	115.624729	-33.546736
159	Jarrah	80	Suitable DBH no hollows						115.624684	-33.546735
160	Marri	75	Suitable DBH no hollows						115.623935	-33.546729
161	Marri	60	Suitable DBH no hollows						115.623368	-33.546727
162	Marri	50	Suitable DBH no hollows						115.622947	-33.546740

ID	Species	DBH (cm)	Comments	Hollows	Size	Type	Height	Note	Latitude (GDA94)	Longitude
163	Marri	55	Suitable DBH no hollows						115.622764	-33.546741
164	Marri	55	Suitable DBH no hollows						115.622764	-33.546741
165	Marri	55	Suitable DBH no hollows						115.621942	-33.546748
166	Marri	50	Suitable DBH no hollows						115.621317	-33.546733
167	Marri	55	Suitable DBH no hollows						115.618634	-33.546737
168	Marri	50	Suitable DBH no hollows						115.618291	-33.546727
169	Marri	60	Suitable DBH no hollows						115.617775	-33.546727
170	Marri	55	Suitable DBH no hollows						115.617241	-33.546730
171	Marri	55	Suitable DBH no hollows						115.617021	-33.546734
172	Marri	50	Suitable DBH no hollows						115.617021	-33.546734
173	Marri	50	Suitable DBH no hollows						115.615567	-33.546723
174	Dead	65	Unsuitable hollow	1	to 10cm	Spout angle NOT suitable	to 10m	Too small	115.599414	-33.546704
175	Marri	50	Suitable DBH no hollows						115.599161	-33.546685
176	Marri	55	Suitable DBH no hollows						115.598181	-33.546666
177	Marri	70	Suitable DBH no hollows						115.597482	-33.546677
178	Marri	55	Suitable DBH no hollows						115.595565	-33.546677
179	Dead	60	Suitable DBH no hollows						115.595565	-33.546677
180	Marri	55	Suitable DBH no hollows						115.595221	-33.546675
181	Marri	50	Suitable DBH no hollows						115.594617	-33.546666
182	Marri	50	Suitable DBH no hollows						115.594426	-33.546670
183	Marri	70	Unsuitable hollow	1	10 to 15cm	Vertical	to 10m	Blocked debris	115.594067	-33.546752
184	Marri	65	Suitable DBH no hollows						115.593778	-33.546682
185	Marri	50	Suitable DBH no hollows						115.593710	-33.546677
186	Marri	50	Suitable DBH no hollows						115.593645	-33.546675
187	Marri	65	Suitable DBH no hollows						115.593307	-33.546682
188	Marri	100	Suitable size signs C	2	10 to 15cm, 15 to 20cm	Vertical, Spout	to 10m, to 10 m	Fresh chewing (hollow one), no evidence of use and insufficient dimensions (hollow two)	115.592822	-33.546760

ID	Species	DBH (cm)	Comments	Hollows	Size	Type	Height	Note	Latitude (GDA94)	Longitude
189	Marri	55	Suitable DBH no hollows						115.592336	-33.546682
190	Marri	60	Suitable DBH no hollows						115.591997	-33.546695
191	Marri	50	Suitable DBH no hollows						115.590686	-33.546677
192	Marri	50	Suitable DBH no hollows						115.590283	-33.546680
193	Marri	55	Suitable DBH no hollows						115.589848	-33.546681
194	Marri	60	Suitable DBH no hollows						115.589723	-33.546671
195	Dead	55	Suitable DBH no hollows						115.588947	-33.546673
196	Dead	55	Suitable DBH no hollows						115.588733	-33.546680
197	Marri	50	Suitable DBH no hollows						115.587579	-33.546665
198	Marri	50	Suitable DBH no hollows						115.583866	-33.546675
199	Marri	50	Suitable DBH no hollows						115.583866	-33.546675
200	Marri	55	Suitable DBH no hollows						115.583517	-33.546679
201	Marri	50	Suitable DBH no hollows						115.583517	-33.546679
202	Marri	50	Suitable DBH no hollows						115.583284	-33.546671
203	Marri	50	Suitable DBH no hollows						115.581340	-33.546682

Note: Only best hollows recorded.

Appendix G Hollow Assessment

Note: Only best hollows shown.

Tree ID	Comments	H1 note	
188	Tree with potentially suitable size hollow with signs of use (Confirmed).	10-15cm aperture, evidence of recent chewing and possible suitable dimensions. Aperture potentially too small and aperture of cavity potentially too small. Due to small aperture, shallow depth, and small hollow base, recent chewing unlikely to be attributed to black cockatoos.	 