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ENVIRONMENTAL SCIENCES

Basic and Targeted fauna survey for a Proposed Wind Farm in Scott River

Prepared for Synergy Renewable Energy Development Pty Ltd

August 2025

Final

Basic and targeted vertebrate fauna survey for a Proposed Wind Farm in Scott River

Prepared for Synergy Renewable Energy Development Pty Ltd

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EXECUTIVE SUMMARY

Synergy Renewable Energy Development Pty Ltd is investigating the feasibility of a Proposed Wind Farm in Scott River, located approximately 15 km north-east of Augusta, Western Australia. Phoenix Environmental Sciences Pty Ltd (Phoenix) has undertaken a Basic and Targeted fauna survey for the Project to identify fauna of conservation significance to inform the feasibility and design layouts. The study area is 3,891.6 ha and comprises the wind farm area ('WFA') and 3 road intersection areas ('RIAs').

A desktop review compiled a list of potentially occurring species, habitats, and environmental attributes relevant to the Project. This information was used to inform the design of the Basic and Targeted fauna survey that was undertaken by experienced zoologists over 3 phases between August 2023 and January 2025. Phoenix also conducted a bird and bat risk assessment survey (BBRAS) for the Project over 2023 to 2025, which is documented in detail in a separate report; however, the species recorded are referenced in this report for a complete list of the fauna assemblage for the study area.

The desktop review identified records of 262 vertebrate taxa, with 256 being native and 6 introduced. The list comprised 12 amphibians, 24 reptiles, 198 birds and 28 mammals. Of these, 71 are conservation significant, with the majority (45) being listed as Migratory (Mig.) species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and/or *Biodiversity Conservation Act* 2016 (BC Act). Forty-one species are also listed as Threatened and 9 species are listed as Priority species. Three Threatened species have previously been recorded in the study area based on the desktop records: Baudin's Cockatoo (*Zanda baudinii*; Endangered (EN)), Carnaby's Cockatoo (*Zanda latirostris*; EN), and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*; Vulnerable (VU)).

Ten fauna habitat types were identified in the study area: 3 wetland habitats; 2 woodlands; and 5 highly modified habitats, the latter covering approximately 80% of the study area. The native habitat suite comprised many small, isolated (and often degraded) remnants of limited value, as well as several larger patches which are typically in better condition. Many of the large patches have been fenced off to prevent stock access.

The wetlands were a mix of Seasonally inundated paperbark woodlands, shrublands and sedgelands, collectively covering 378 ha (9.7%) of the study area. Nearly all were relatively shallow with water level typically less than 1 m. They dried up through late spring, with a couple of exceptions. The woodlands comprised Marri-Jarrah-Peppermint woodland and Open woodland of Peppermint trees (degraded), together covering 420.9 ha (10.8%). They occurred as remnant vegetation patches and roadside vegetation in the WFA, as well as in the central and eastern RIAs.

The faunal assemblage identified in the surveys was ~58% of the possible richness identified in the desktop species list, with 122 species recorded in this Basic and Targeted fauna survey and additional species recorded in the BBRAS taking the total for the study area to 158 species. This included 12 species that were not identified in the desktop review. With several wetlands present and an abundance of seasonally inundated paddocks, waterbirds were prominent in the fauna assemblage. Raptors were also prevalent (14 species), and 17 mammals were recorded, including 8 bats, 3 marsupials and 6 introduced species. Red Fox was observed on multiple occasions, often during the day in the open.

Ten conservation significant species were recorded in the study area based on the results of the Basic and Targeted fauna survey and the BBRAS:

- Western Ringtail Possum (*Pseudocheirus occidentalis*; Critically Endangered)
- Baudin's Cockatoo (*Zanda baudinii*; EN)
- Carnaby's Cockatoo (*Zanda latirostris*; EN)
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*; VU)

- Masked Owl (southwest) (*Tyto novaehollandiae novaehollandiae*; Priority (P) 3)
- Quenda (*Isoodon fusciventer*; P4)
- Western False Pipistrelle (*Falsistrellus mackenziei*; P4)
- Wood Sandpiper (*Tringa glareola*; Mig.)
- Osprey (*Pandion haliaetus*; Mig.)
- Peregrine Falcon (*Falco peregrinus*; species otherwise in need of special protection).

Four other significant species were considered likely to occur based on record currency and suitability of available habitat in the study area.

Of the 5 native habitat types, all have some value for significant vertebrate fauna, although this did not apply to the entire extent of each habitat type due to differences in condition, patch size and isolation:

- Marri-Jarrah-Peppermint woodland – records of, and contains suitable habitat for, all 3 black cockatoo species, Western Ringtail Possum, Masked Owl (southwest) and Western False Pipistrelle. Contains suitable habitat for Quenda and Peregrine Falcon. Contains most (88.9%) of the potential nesting trees (PNT) for black cockatoos in the study area and the only high-quality foraging habitat.
- Open woodland of Peppermint trees (degraded) – contains suitable habitat for Baudin's Cockatoo, Forest Red-tailed Black Cockatoo, Western False Pipistrelle, Masked Owl (southwest) and Peregrine Falcon. Degraded nature of the understorey limits the value to most ground-dwelling species, and a lack of tree hollows and tree diversity limits value to nesting birds and arboreal mammals. Few PNTs.
- Seasonally inundated paperbark woodland (wetland) – contains suitable habitat for several Migratory shorebirds, Wood Sandpiper recorded. Contains suitable habitat for all 3 black cockatoo species, Quenda, Peregrine Falcon and Osprey. Few PNTs.
- Seasonally inundated sedgeland (wetland) – contains suitable habitat for all 3 black cockatoo species, several Migratory shorebirds, Western False Pipistrelle, Quenda, Peregrine Falcon and Osprey. Records of Western False Pipistrelle, foraging records of Baudin's Cockatoo and/or Carnaby's Cockatoo.
- Seasonally inundated shrubland (wetland) – records of, and suitable habitat for, Western False Pipistrelle and Quenda. Suitable habitat for all 3 black cockatoo species, several Migratory shorebirds, Peregrine Falcon and Osprey. Contains 7.1% of PNTs in the study area.

Suitable foraging habitat for Migratory shorebirds is mainly restricted to small window between early/mid-spring – early summer, when the birds have arrived in the Southwest and while wetlands remain inundated. Despite repeat sampling over 2 Migratory shorebird seasons, only a single Migratory shorebird has been detected, Wood Sandpiper. No overwintering has been detected. The results of this study therefore strongly suggest that wetlands in the study area do not represent important Migratory shorebird habitat at any time of the year.

All 3 species of black cockatoo were directly observed, with additional detections obtained via the long-term audio recorders deployed in Phase 3. Forest Red-tailed Black Cockatoo was directly observed most, followed by Carnaby's Cockatoo and then Baudin's Cockatoo. All 3 species were most observed moving about and over the study area, rather than actively using it, although several instances of foraging were observed directly, mainly by Forest Red-tail Black Cockatoo. Conversely, the long-term audio recorders detected white-tailed black cockatoos more frequently than Forest Red-tailed Black Cockatoo.

No evidence to suggest any of the 3 species breed or have night roosts in the study area was recorded despite extensive surveillance, which is not surprising given no known nesting trees and only 4 suitable nesting trees were identified from 760 PNTs recorded in the study area. The survey results indicate

the primary value of the habitats in the study area to black cockatoos is in providing foraging resources. Extensive foraging habitat for black cockatoos is present in the vicinity of the study area, with Jarrah Forest occurring directly to the north and east, and proteaceous shrublands and *Banksia* woodlands to the south-west in the Scott National Park.

The study area falls outside the Swan Coastal Plain management zone for the Western Ringtail Possum under the recovery plan for the species, which identifies habitat critical as being associated with Peppermint woodlands. While the study area contains Peppermint woodland, it is highly degraded and occurs in isolated patches and therefore is not considered suitable for Western Ringtail Possum. However, the Marri-Jarrah-Peppermint woodland habitat appears to be of importance to the species, with several direct records made from this habitat type, including females with juveniles. Occurrence in the WFA appears to be restricted to the woodland remnants near its boundaries, where such habitat is contiguous with larger intact remnants outside the WFA. Similarly, the records from the RIA suggest the same, i.e. a direct connection to habitat with a much larger extent outside the study area, in this case the South Blackwood State Forest.

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ACRONYMS AND ABBREVIATIONS

Abbreviation	Description
ARU	Autonomous recording unit
BBRAS	Bird and bat risk assessment survey (Phoenix 2025a)
BCE	Bamford Consulting Ecologists
BC Act	*Biodiversity Conservation Act 2016*
BoM	Bureau of Meteorology
CAMBA	China-Australia Migratory Bird Agreement
CD	Conservation Dependent
DBCA	Department of Biodiversity, Conservation and Attractions
DBH	Diameter at breast height
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPIRD	Department of Primary Industries and Regional Development
EOO	Extent of occurrence
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority (WA)
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
ESA	Environmentally Sensitive Area
FRTBC	Forest Red-tailed Black Cockatoo
IBRA	Interim Biogeographic Regionalisation of Australia
IBSA	Index of Biodiversity Surveys for Assessment
IUCN	International Union for the Conservation of Nature
JAMBA	Japan-Australia Migratory Bird Agreement
NES	National Environmental Significance
OS	Species otherwise in need of special protection
PEC	Priority Ecological Communities
PNT	Potential Nesting Tree
RIA	The 3 road intersection areas
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
SP	Specially protected
SWREL	South West Regional Ecological Linkages
TEC	Threatened Ecological Communities
WA	Western Australia
WAPC	Western Australian Planning Commission
WFA	Wind Farm Area
WRP	Western Ringtail Possum

1 INTRODUCTION

Synergy Renewable Energy Development Pty Ltd (SynergyRED) is a wholly owned subsidiary of Synergy Pty Ltd. SynergyRED is investigating the feasibility of a Proposed Wind Farm in Scott River (the Project), located approximately 15 km north-east of Augusta, Western Australia (WA; Figure 1-1). In April 2023, Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by SynergyRED to undertake Basic and Targeted vertebrate fauna survey for the Project.

1.1 OBJECTIVES AND SCOPE OF WORK

The objective of the Basic and Targeted vertebrate fauna survey was to identify fauna of conservation significance to inform the feasibility and design layouts. The survey will be used to support environmental and planning approvals as required.

The scope of the Basic and Targeted fauna survey was to:

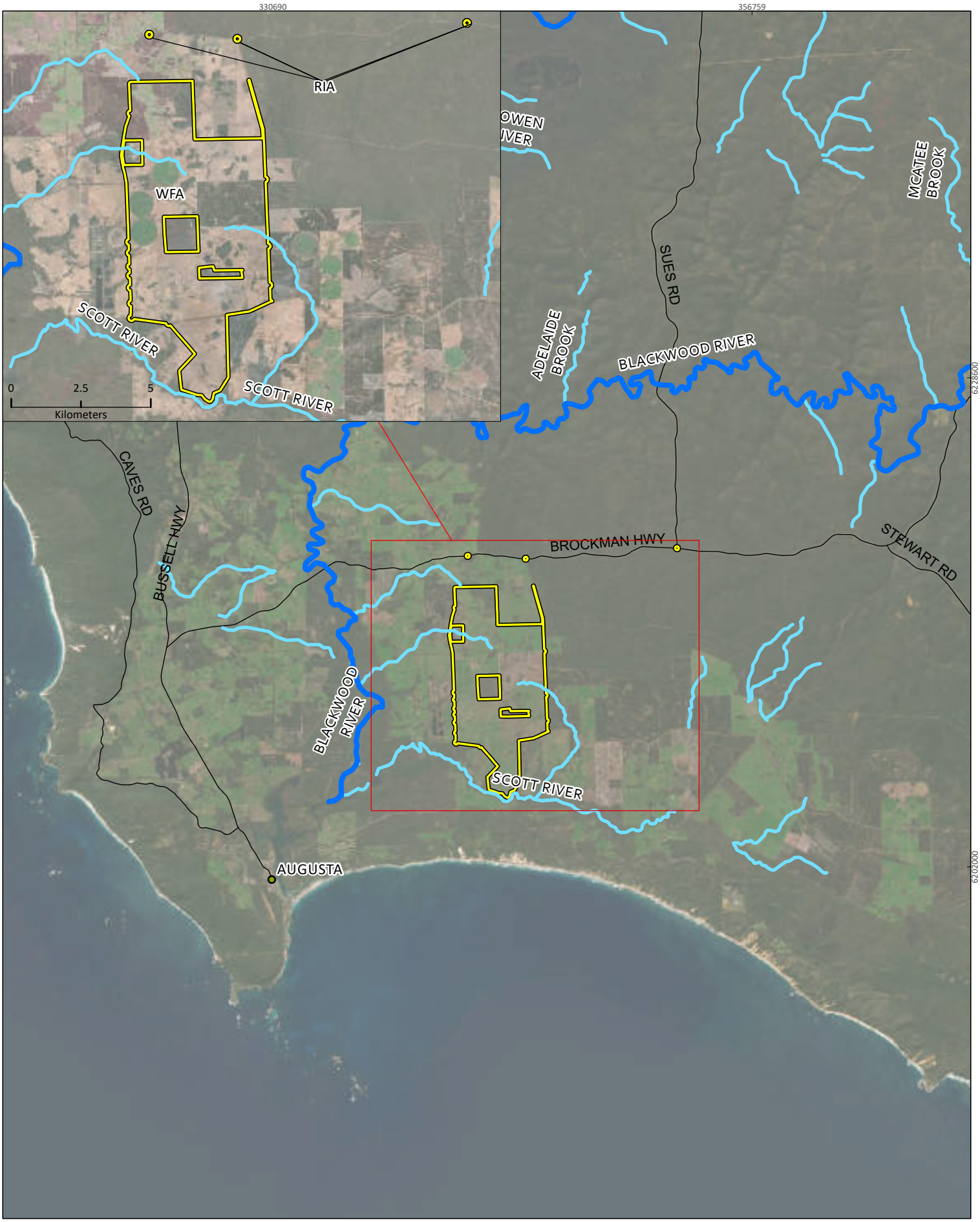
- identify potentially occurring significant fauna species via a desktop assessment
- document occurring fauna species detectable via a Basic fauna survey
- map general fauna habitats and identify habitats for significant species
- conduct targeted surveys for black cockatoos, Australasian Bittern and Western Ringtail Possum.

Phoenix also conducted a bird and bat risk assessment survey (BBRAS) for the Project over 2 years between 2023 and 2025. The results of that survey are documented in detail in Phoenix (2025a) but records of conservation significant birds and bats are also reported here for completeness, as appropriate.

1.2 STUDY AREA

The total study area is 3,891.6 ha and comprises (Figure 1-1):

- the wind farm area (the 'WFA', approximately 3,882.2 ha)
- 3 road intersection areas (the 'RIAs', approximately 9.4 ha).



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Proposed wind farm in Scott River

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Map author	KC

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Kilometers

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- Study area
- Major watercourses
- Minor watercourses
- Roads

Figure 1-1

Project location and study area

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2 LEGISLATIVE CONTEXT

The protection of fauna in WA is principally governed by 3 acts:

- Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
- State Biodiversity Conservation Act 2016 (BC Act)
- State Environmental Protection Act 1986 (EP Act).

2.1 COMMONWEALTH

The EPBC Act is administered by the Federal Department of Climate Change, Energy, the Environment and Water (DCCEEW). The EPBC Act provides for the listing of Threatened fauna as matters of National Environmental Significance (NES). Under the EPBC Act, actions that have, or are likely to have, a significant impact on a matter of NES, require approval from the Australian Government Minister for the Environment through a formal referral process. Key threats and habitat critical to the survival of EPBC Act Threatened species are usually defined in the conservation advice and/or recovery plan for the species.

Conservation categories applicable to Threatened fauna species under the EPBC Act are as follows:

- Extinct (EX)1 – there is no reasonable doubt that the last individual has died
- Extinct in the Wild (EW) – taxa known to survive only in captivity
- Critically Endangered (CR) – taxa facing an extremely high risk of extinction in the wild in the immediate future
- Endangered (EN) – taxa facing a very high risk of extinction in the wild in the near future
- Vulnerable (VU) – taxa facing a high risk of extinction in the wild in the medium-term
- Conservation Dependent (CD)1 – taxa whose survival depends upon ongoing conservation measures; without these measures, a conservation dependent taxon would be classified as Vulnerable, Endangered or Critically Endangered.

The EPBC Act is also the enabling legislation for protection of Migratory species as matters of NES under several international agreements:

- Japan-Australia Migratory Bird Agreement (JAMBA)
- China-Australia Migratory Bird Agreement (CAMBA)
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn)
- Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

2.2 STATE

2.2.1 Threatened and Priority species

In WA, the BC Act provides for the listing of Threatened fauna species (Government of Western Australia 2018a, b) in the following categories:

- Critically Endangered (CR) – species facing an extremely high risk of extinction in the wild in the immediate future2
- Endangered (EN) – species facing a very high risk of extinction in the wild in the near future2

[1] Species listed as Extinct and Conservation Dependent are not matters of NES and therefore do not trigger the EPBC Act.

[2] As determined in accordance with criteria set out in the ministerial guidelines.

- Vulnerable (VU) – species facing a high risk of extinction in the wild in the medium-term future2.

Species may also be listed as specially protected (SP) under the BC Act in one or more of the following categories:

- species of special conservation interest (conservation dependent fauna, CD) – species with a naturally low population, restricted natural range, of special interest to science, or subject to or recovering from a significant population decline or reduction in natural range,
- Migratory species (Mig.), including birds subject to international agreement,
- species otherwise in need of special protection (OS).

The Department of Biodiversity, Conservation and Attractions (DBCA) administers the BC Act and maintains a non-statutory list of Priority fauna. Priority species are still considered to be of conservation significance – that is they may be Threatened – but cannot be considered for listing under the BC Act until there is adequate understanding of threat levels imposed on them. Species on the Priority fauna lists are assigned to one of 4 Priority (P) categories, P1 (highest) – P4 (lowest), based on level of knowledge/concern.

2.2.2 Critical habitat

Under the BC Act, habitat is eligible for listing as critical habitat if it is critical to the survival of a Threatened species and its listing is otherwise in accordance with the ministerial guidelines. This provision pertains to formal listing by the Minister, as distinct from (for example) critical habitat for a Threatened fauna species referred to in a recovery plan or conservation advice.

2.2.3 Other significant fauna

Under the EPA's environmental factor guideline, fauna may be considered significant for a range of reasons other than listing as a Threatened or Priority species. EPA (2016a) identifies the following attributes that constitute significant fauna:

- species with restricted distribution
- species subject to a degree of historical impact from threatening processes
- providing an important function required to maintain the ecological integrity of a significant ecosystem.

3 EXISTING ENVIRONMENT

3.1 INTERIM BIOGEOGRAPHIC REGIONALISATION OF AUSTRALIA

The Interim Biogeographic Regionalisation of Australia (IBRA) classifies Australia's landscapes into 89 'bioregions' and 419 'subregions' based on climate, geology, landform, native vegetation and species information (DoEE 2016). In WA there are 27 bioregions and 55 subregions. The study area is located predominantly within the Warren (WAR01) subregion, with a very small area (mainly the RIAs) in the north within the Southern Jarrah Forest (JAF02) subregion (Figure 3-1). The Warren bioregion (and analogous subregion) is made up of dissected undulating country of the Leeuwin Complex, Southern Perth Basin (Blackwood Plateau), south-west intrusions of the Yilgarn Craton and western parts of the Albany Orogen. The area sustains loamy soils supporting Karri forest, laterites supporting Jarrah-Marri forest, leached sandy soils in depressions and plains supporting low Jarrah woodlands and paperbark/sedge swamps, and holocene marine dunes with Agonis flexuosa and Banksia woodlands and heaths (May & McKenzie 2003). The Southern Jarrah Forest subregion is made up of duricrusted plateau of Yilgarn Craton characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by Wandoo - Marri woodlands on clayey soils. Eluvial and alluvial deposits support Agonis shrublands. In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands. The climate is Warm Mediterranean (May & McKenzie 2003).

3.2 LAND SYSTEMS AND SURFACE GEOLOGY

DPIRD undertook land system mapping for WA using a nested soil-landscape mapping hierarchy (Schoknecht & Payne 2011). While the primary purpose of the mapping is to inform pastoral and agricultural land capability, it is also useful for informing biological assessments. Under this hierarchy, land systems are defined as areas with recurring patterns of landforms, soils, vegetation and drainage (Payne & Leighton 2004). The study area intersects 2 land systems (Table 3-1; Figure 3-2).

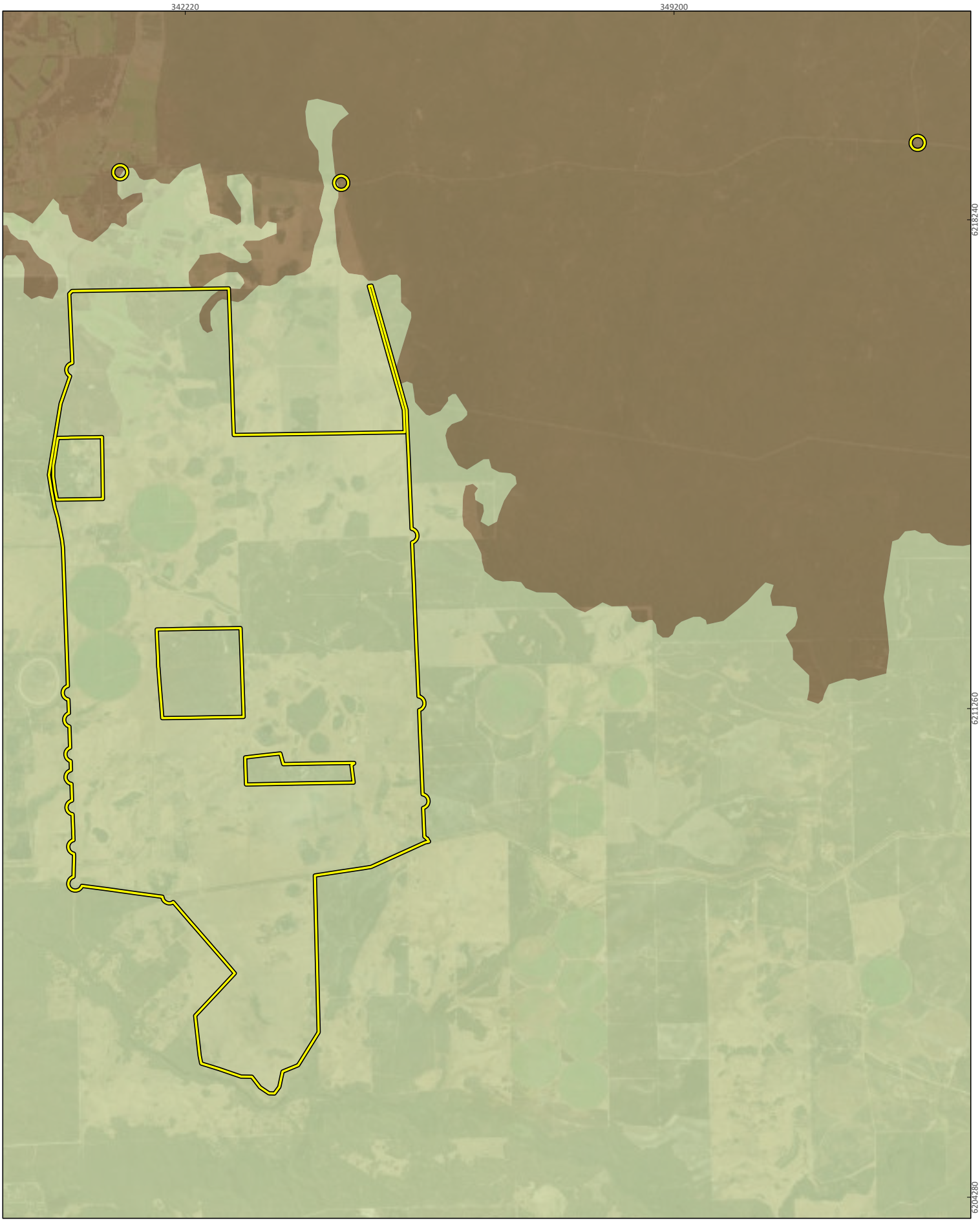
Table 3-1 Land systems and extent in study area

Land system	Description	Area (ha)	% of study area
Nillup Plain System	Poorly drained plain, in the southern Donnybrook Sunkland. Sandy gravel, non-saline wet soil, grey deep sandy duplex, loamy gravel and pale deep sands. Jarrah-Marri-paperbark woodland.	26.8	0.7
Scott River Plain System	Poorly drained coastal plain, in the southern Donnybrook Sunkland. Non-saline wet soil and pale deep sand. Heaths, sedgelands and Jarrah-Marri-paperbark woodland.	3,864.8	99.3
	Total	**3,891.6**	**100**

According to the Surface Geology of Australia 1:1,000,000 scale, WA database (Stewart *et al.* 2008), the study area intersects 3 geological formations (Table 3-2; Figure 3-2).

Table 3-2 Surface geology of the study area, extent by deposit type

Surface geology	Abbreviation	Description	Area (ha)	% of study area
Estuarine, lagoonal, and lacustrine deposits 74394	Cze	Estuarine, lagoonal, and lacustrine deposits. Numerous small lakes and swamps. Linear dunes common.	3,832.9	98.5
Bunbury basalt	Kbb	Porphyritic tholeiitic basalt.	49.3	1.3
Ferruginous duricrust 38498	Czl	Pisolitic, nodular or vuggy ferruginous laterite; some lateritic soils; ferricrete; magnesite; ferruginous and siliceous duricrusts and reworked products, calcrete, kaolinised rock, gossan; residual ferruginous saprolite.	9.4	0.2
		Total	**3,891.6**	**100.0**



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Study area

Region, subregion

Jarrah Forest, Southern Jarrah Forest

Warren, Warren

Figure 3-1

Study area in relation to IBRA bioregions and subregions

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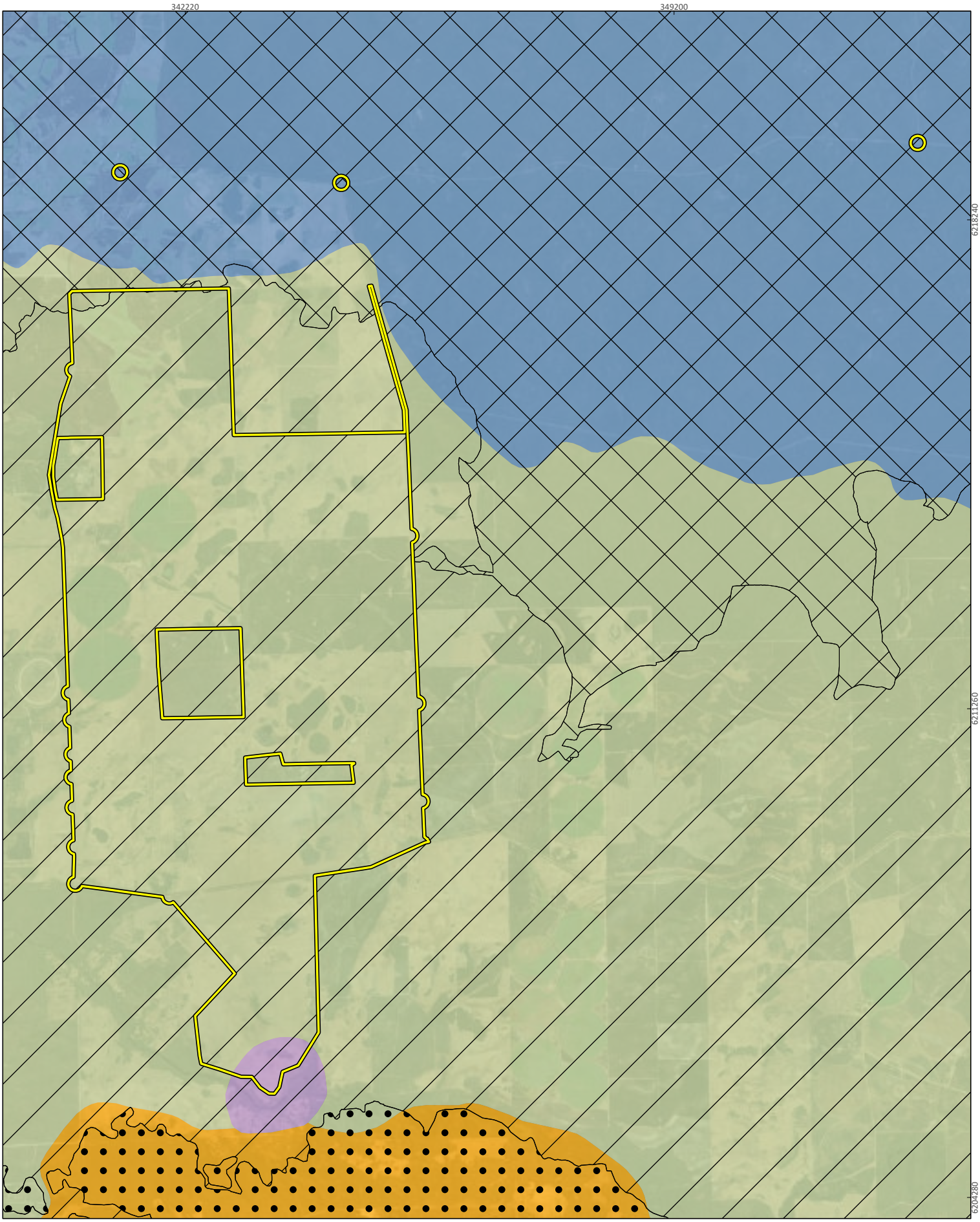

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Study area

Surface geology
- Cze
- Czl
- Kbb
- Qdct

Land system
- D'Entrecasteaux Dunes System
- Nillup Plain System
- Scott River Plain System

Figure 3-2

Land systems and surface geology in the study area

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3.3 CLIMATE AND WEATHER

The climate of the Warren (WAR01) subregion is described as Warm Mediterranean and moderate Mediterranean, respectively. The nearest Bureau of Meteorology (BoM) weather station with comprehensive data collection and recent historic climate data is Cape Leeuwin (no. 009518, Latitude: 34.37°S Longitude 115.14°E), located 17.8 km south-west of the study area.

Cape Leeuwin records the highest mean maximum monthly temperature (23.4°C) in February and the lowest in July and August (16.5°C). The lowest mean minimum monthly temperature in June (11.3°C) and highest in February (17.3°C) (Figure 3-3). Mean annual rainfall is 947.5 mm, with July and June recording the highest mean monthly rainfall total (178.2 mm and 174.1 mm, respectively) (Figure 3-3).

Daily mean maximum and minimum temperatures at Cape Leeuwin between May 2023 and January 2025 (which includes all survey months) were almost all higher than long-term averages (Figure 3-3), in some cases substantially, e.g. monthly mean maximum temperature for October 2023 was 2°C higher than the long-term average and May 2024 was 3°C higher. Across the complete survey period, monthly mean maximum and minimum temperatures were on average, 1.1°C and 1.0°C above the long-term means, respectively. The above average temperatures over the survey period are reflective of the warming trend occurring within south-west WA.

Rainfall records from Cape Leeuwin show monthly totals during 2023–2025 did not correlate closely with long-term averages. Only 4 months (of 21 months shown) received higher than average monthly rainfall totals (June 2023, March 2024, April 2024, June 2024 and August 2024). August 2024 received the highest rainfall with 228.4 mm received compared to the long-term average of 135.1 mm. This is reflective of the drying trend occurring within south-west WA.

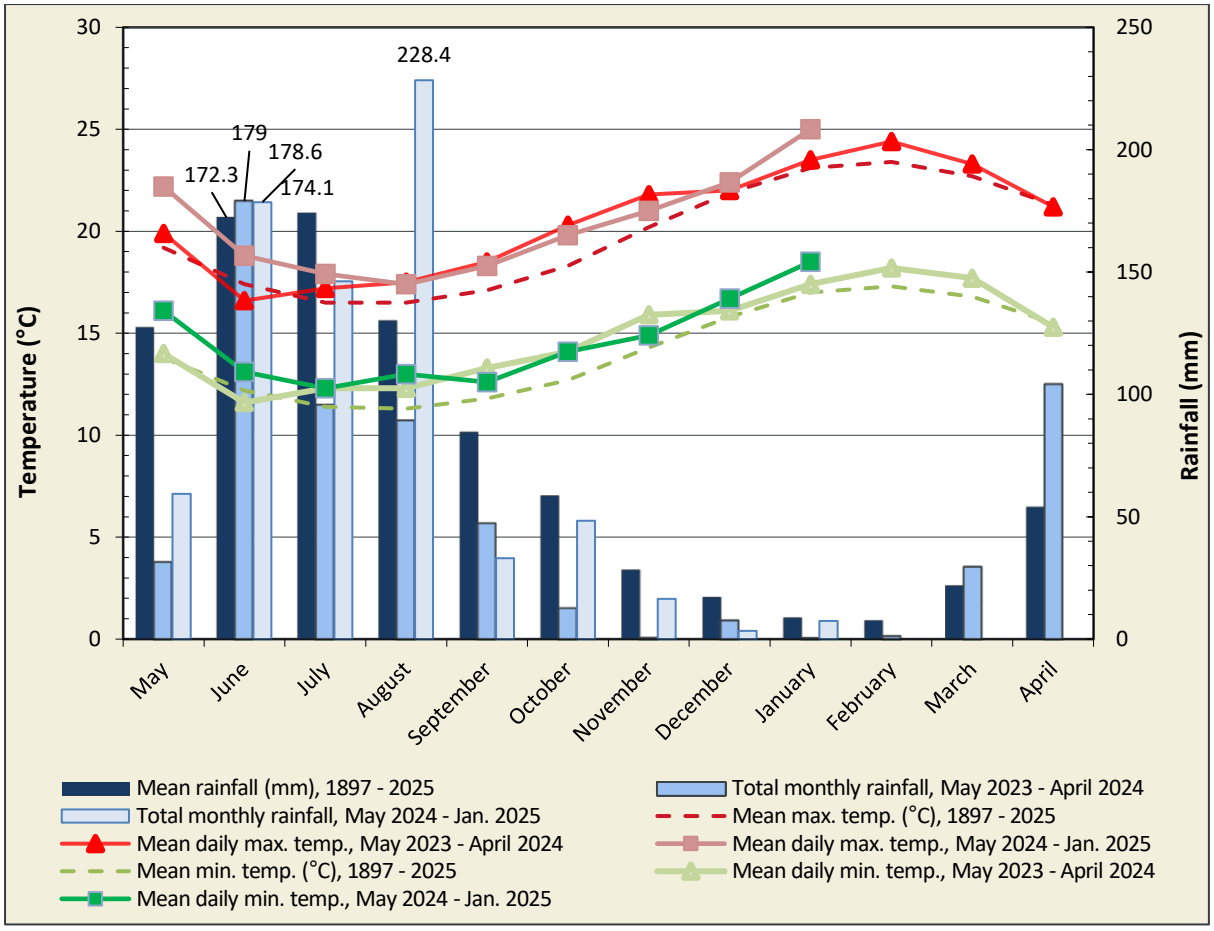


Figure 3-3 **Annual climate and weather data for Cape Leeuwin (no. 009518) and mean monthly data for the survey period (BoM 2024)**

3.4 LAND USE

Land use within the Warren and Southern Jarrah Forest subregions consists of predominantly dryland agriculture and plantations (3,739,542 ha or 36%), the majority of which is modified pastures for grazing, and cropping (Table 3-3). This is closely followed by conservation and natural environments (3,572,471 ha or 34%), the majority of which is subclass 1 – "nature conservation", being 24% of the total area. Similar proportions of the region are used for irrigated agriculture and plantations (132,365 ha), intensive uses (101,356 ha) and water (162,785 ha).

Table 3-3 **Land use within the Warren and Southern Jarrah Forest regions (ABARES 2018)**

Land use	Area (ha)
1 Conservation and natural environments	**3,572,471**
1.1 Nature conservation	2,486,646
1.2 Managed resource protection	1,089
1.3 Other minimal use	1,084,737
2 Production from relatively natural environments	**2,649,200**
2.1 Grazing native vegetation	61,997
2.2 Production native forests	2,587,203

Land use	Area (ha)
3 Production from dryland agriculture and plantations	**3,739,542**
3.1 Plantation forests	771,191
3.2 Grazing modified pastures	1,830,075
3.3 Cropping	1,128,405
3.4 Perennial horticulture	361
3.5 Seasonal horticulture	95
3.6 Land in transition	9,414
4 Production from irrigated agriculture and plantations	**132,365**
4.0 Production from irrigated agriculture and plantations	35
4.1 Irrigated plantation forests	598
4.2 Grazing irrigated modified pastures	56,813
4.3 Irrigated cropping	334
4.4 Irrigated perennial horticulture	62,330
4.5 Irrigated seasonal horticulture	8,406
4.6 Irrigated land in transition	3,849
5 Intensive uses	**101,356**
5.0 Intensive uses	4
5.1 Intensive horticulture	249
5.2 Intensive animal production	6,865
5.3 Manufacturing and industrial	2,008
5.4 Residential and farm infrastructure	41,183
5.5 Services	10,148
5.6 Utilities	268
5.7 Transport and communication	24,566
5.8 Mining	15,462
5.9 Waste treatment and disposal	599
6 Water	**162,785**
6.0 Water	8
6.1 Lake	51,489
6.2 Reservoir/dam	32,353
6.3 River	10,755
6.4 Channel/aqueduct	63
6.5 Marsh/wetland	53,748
6.6 Estuary/coastal waters	14,369
Grand total	**10,357,716**

3.5 CONSERVATION RESERVES AND ESAS

Numerous conservation reserves, national parks and State Forest occur within 10 km of the study area (Figure 3-4). Two National Parks and 2 Nature Reserves and one State Forest partially intersect and/or share a boundary with the study area:

- Blackwood River National Park – intersects part of the most eastern RIA (~0.6 ha)
- Scott National Park – very small (~0.07 ha) intersect at the south-west corner of the WFA
- Pagett Nature Reserve – adjoins part of the eastern boundary of the WFA
- Unnamed R42377 Nature Reserve – occurs within but excluded from the WFA
- South Blackwood State Forest – intersects part of the central RIA and adjoins part of the eastern boundary of the WFA (~2.4 ha).

Several additional reserves also occur within 10 km of the study area:

- Milyeannup National Park
- Wiltshire-Butler National Park
- Leeuwin-Naturalist National Park
- Unnamed WA46400 National Park
- Chester Nature Reserve
- Gingilup Swamps Nature Reserve
- Ngari Capes Marine Park
- Unnamed R42942 Nature Reserve
- Unnamed R15185 Nature Reserve
- Unnamed O20125 Timber Reserve
- Unnamed O12925 Timber Reserve
- Blackwood State Forest
- Milyeannup State Forest.

The gazetted Environmentally Sensitive Areas (ESA) dataset (DWER 2023), which lists areas of high conservation value, shows 61 ESAs intersecting the study area, collectively covering 3,853.3 ha (99% of the study area; Figure 3-5). These appear to be associated with Threatened flora, TECs and wetlands. The mapped polygons encompass a buffer for each value, typically 50 m for Threatened flora/wetlands and between 500 m – 2,000 m for TEC, therefore the true spatial extent of ESAs in the study area is likely much lower than the mapped ESA polygons in Figure 3-5.

3.6 SURFACE HYDROLOGY

Two ephemeral watercourses are located within 10 km of the study area; the Blackwood River located approximately ~4.5 km east of the study area at its closest point; and the Scott River located approximately 1 km south of the study area (Figure 3-6). Both Rivers discharge to the Hardy Inlet, located 8 km south-west of the study area. The Geoscience Australia WA Lakes dataset demarcates the lower reaches of the Scott River ~3.7 km west of the study area as a perennial lake (Figure 3-6).

A number of minor waterways traverse the study area, primarily flowing from north-east to south-west towards the Blackwood River, with a smaller proportion flowing in a southeasterly direction towards Scott River located approximately 1 km south of the study area (Stantec 2025). Approximately 10 km of coastline is also present within 10 km of the study area.

The 'Blackwood River (Lower Reaches) and Tributaries System' is listed as a nationally important wetland (Figure 3-6), which is listed for being a good example of lower reaches of a river (the largest)

in south-western Australia, and good examples of near-pristine creeks (e.g. Spearwood Creek) (DCCEEW 2022a). Another nationally important wetland, the Gingilup-Jasper Wetland System, is located ~19 km east-south-east of the study area (Figure 3-6). This is recognised in the listing as an outstanding example of a near-pristine, extensive system of freshwater lakes, marshes and shrub swamps including the deepest, large freshwater lake in south-western Australia (Lake Jasper) (DCCEEW 2022a). No RAMSAR sites are located in or near the study area.

According to the Geomorphic Wetlands, Augusta to Walpole (DBCA-017) dataset (WRC 2017), which is based on mapping by V. & C. Semeniuk Research Group (2017), ~83% of the study area is wetland (Figure 3-6). The mapping indicates that the study area is dominated by Palusplain (seasonally waterlogged flat) wetlands and includes numerous damplands (seasonally waterlogged basin) and Sumplands (seasonally inundated basin) (Figure 3-6). It was evident from the field surveys and aerial imagery however, that the wetland boundaries are not accurate, and that much of the single polygon that defines the extent of Palusplain wetland is today agricultural land. Currently no management categories have been assigned to the DBCA-017 dataset.

3.7 ECOLOGICAL LINKAGES

The importance of ecological linkages is recognised by existing environmental and planning policy documents (e.g. EPA Guidance Statement 10, EPA Guidance Statement 33 - Chapters B1, B2 and B3, EPA Bulletin 1108 Greater Bunbury Region Scheme Report and Recommendations, and the Western Australian Planning Commission Statement of Panning Policy No 2 Environment and Natural Resources Policy 2003) and is increasingly considered as part of Environmental Impact Assessment, particularly in the Southwest, Great Southern and Wheatbelt regions of WA due to the high degree of fragmentation in those landscapes.

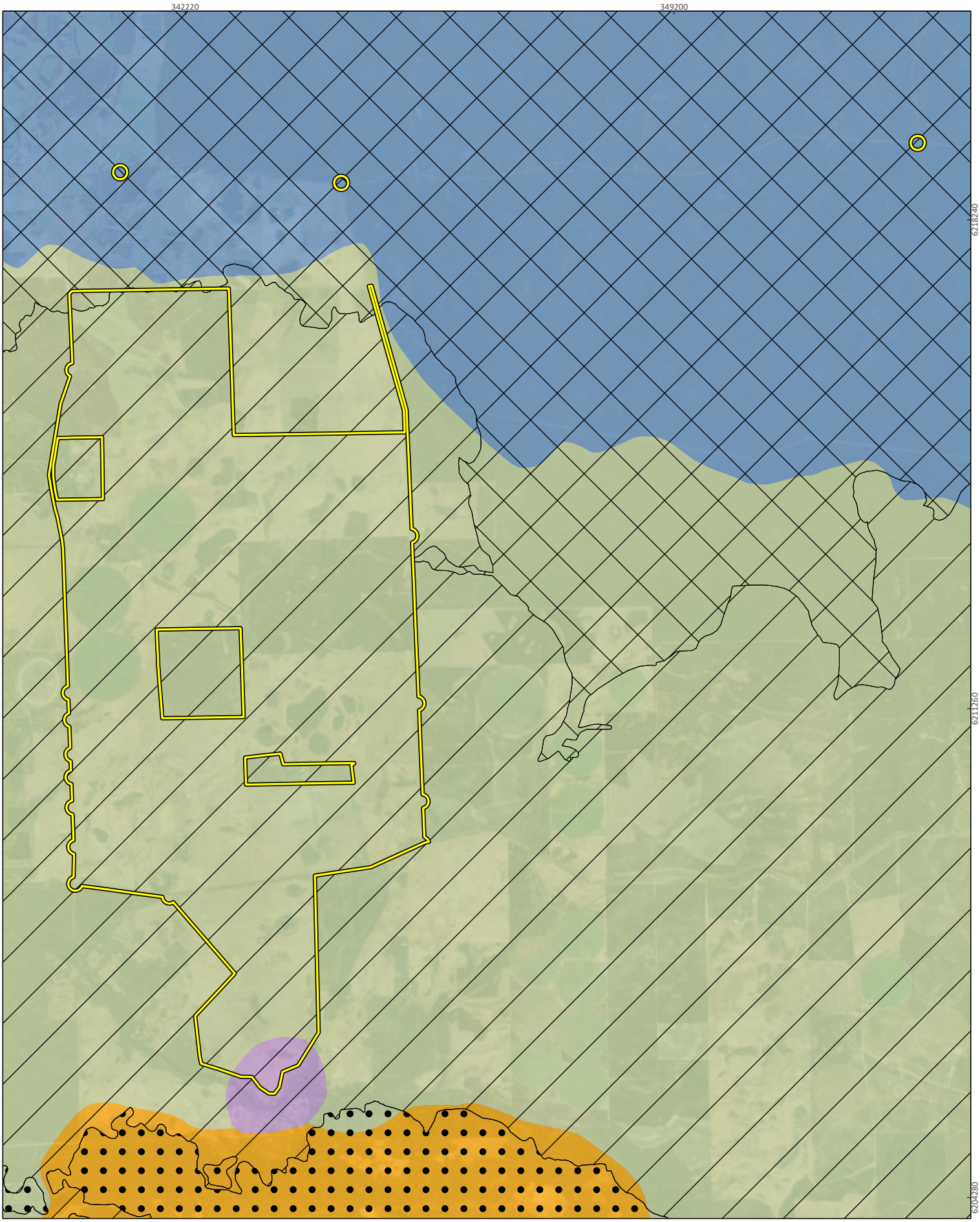
The South West Regional Ecological Linkages (SWREL) Project identified a network of regional-scale ecological linkages throughout the Southwest region (Molloy *et al.* 2009). The network was subsequently extended into the eastern Jarrah Forest, Avon Wheatbelt and Mallee IBRA regions and into the Serpentine-Jarrahdale Shire (Molloy & Deeley 2013)

An ecological linkage was defined by Molloy *et al.* (2009) as:

> "a series of (both contiguous and non-contiguous) patches which, by virtue of their proximity to each other, act as stepping stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across, a landscape."

Ecological linkages are just one measure of the biodiversity conservation value of a patch of native vegetation. The purpose of an ecological linkage therefore is to recognise a patch's additional value to biodiversity conservation and thus they allow managers and planners to achieve more effective planning and impact assessment.

The study area is situated at the junction of 3 SWREL linkages (Figure 3-4). One east-west linkage intersects the northern end of the WFA connecting Pagett Nature Reserve/South Blackwood State Forest with Scott National Park. Another east-west linkage borders the southern boundary of the study area following the Scott River between Gingilup Swamps Nature Reserve (and surrounding coastal remnant vegetation) and Scott National Park. The third linkage runs north-south on the eastern boundary of the study area connecting Pagett Nature Reserve/South Blackwood State Forest to coastal remnants south of the study area.



SynergyRED
Proposed wind farm in Scott River

Project No	1583
Date	14/04/2025
Drawn by	BK
Map author	JC

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Kilometers

1:69,800 (at A4) GDA 1994 MGA Zone 50

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Study area

Surface geology
- Cze
- Czl
- Kbb
- Qdct

Land system
- D'Entrecasteaux Dunes System
- Nillup Plain System
- Scott River Plain System

Figure 3-2

Land systems and surface geology in the study area

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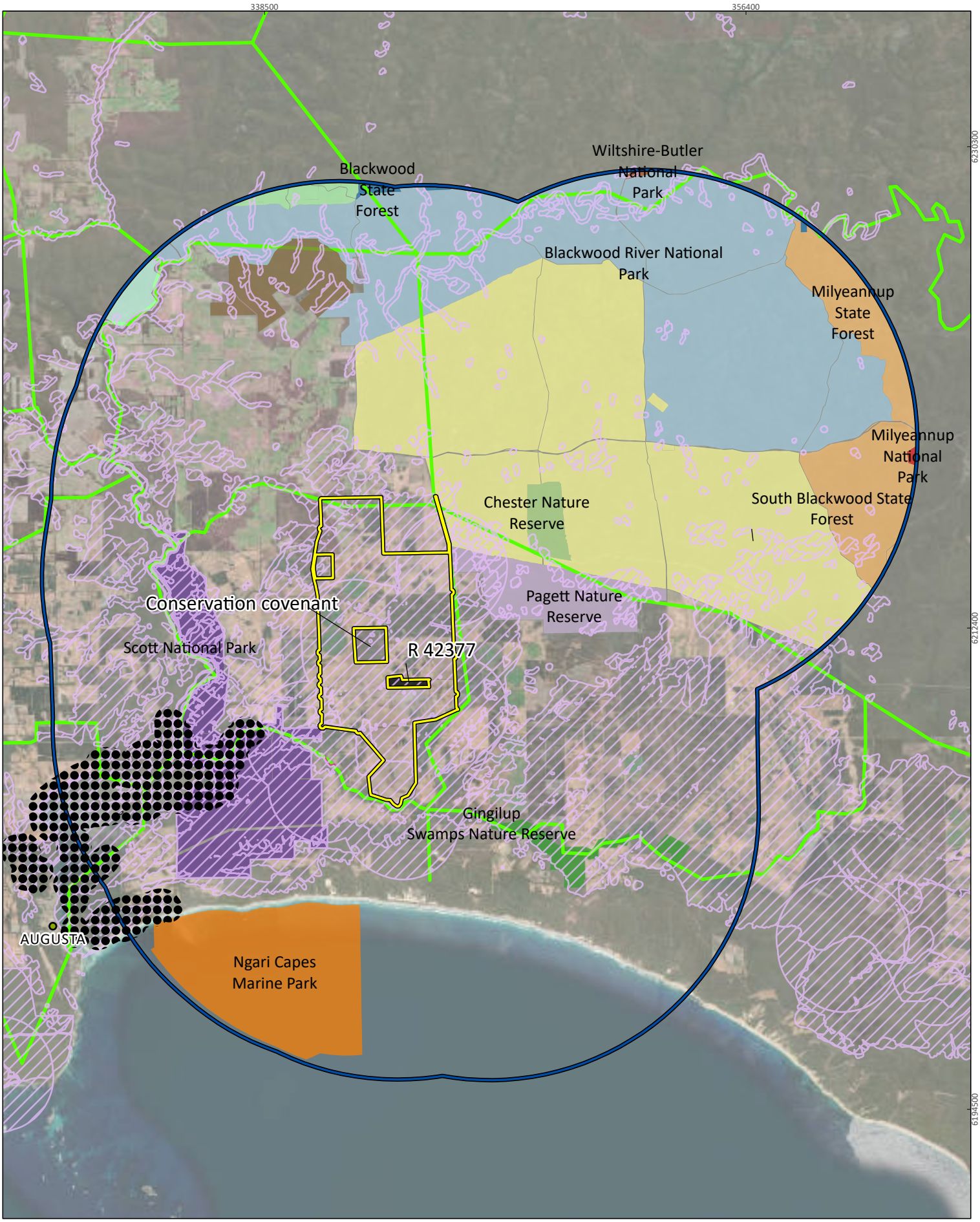

SynergyRED
Scott River Wind Fam

Project No	1585
Date	12/06/2025
Drawn by	BK
Map author	KC

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Kilometers

1:181,800 (at A4) GDA 1994 MGA Zone 50

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- Study area
- Bird/Bat Investigation Area
- South West Regional Ecological Linkages
- Environmentally Sensitive Areas

TEC/PECs

- Subtropical and Temperate Coastal Saltmarsh

- O 129 25
- O 201 25
- R 15185
- R 42377
- R 42942
- R 46400

Figure 3-4

Conservation reserves and ecological linkages

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Proposed wind farm in Scott River

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Date	9/04/2025
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Map author	KC

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- Study area
- 10 km desktop search extent
- Environmentally Sensitive Areas

Figure 3-5

Environmentally Sensitive Areas

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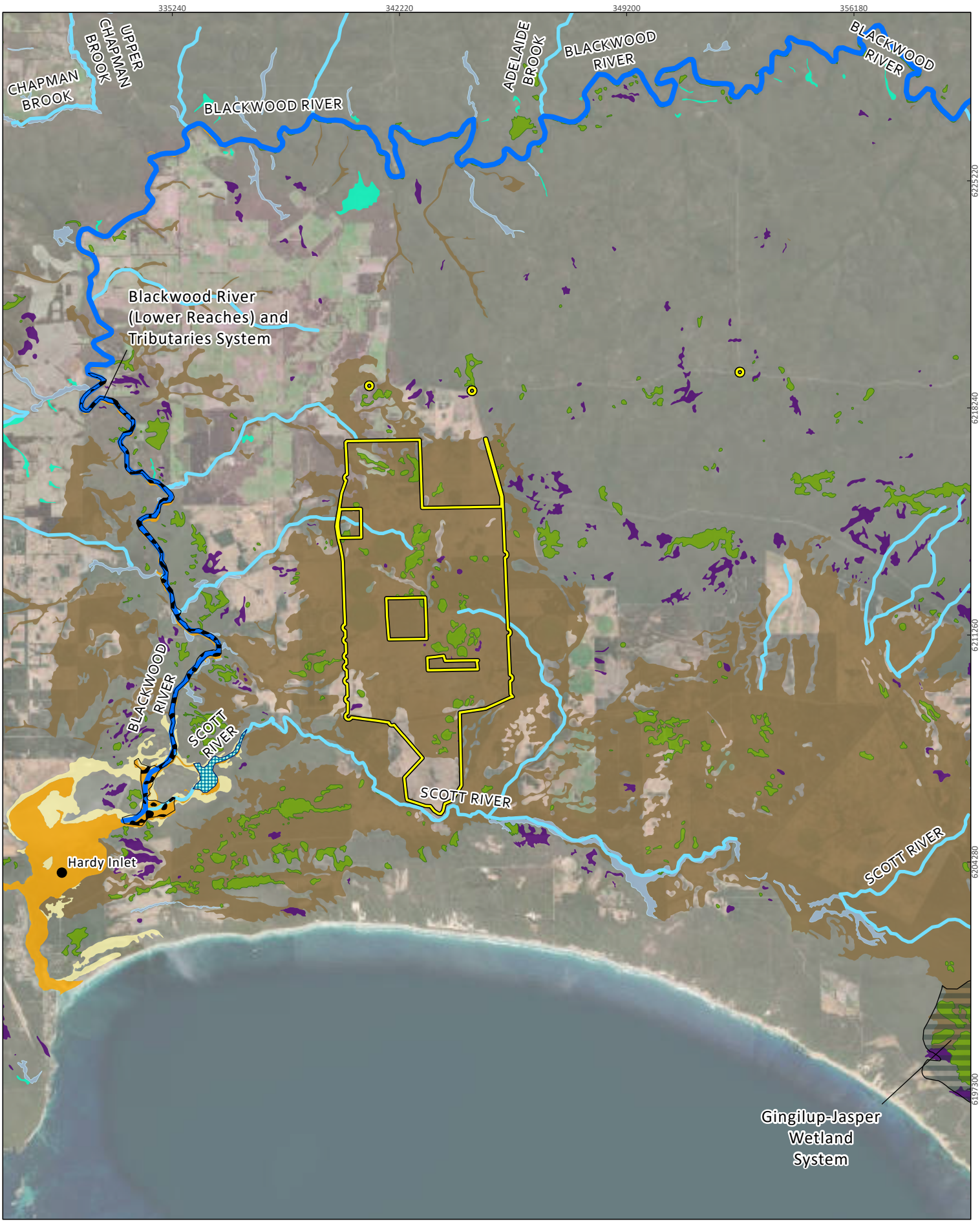

SynergyRED
Proposed wind farm in Scott River

Project No	1583
Date	9/04/2025
Drawn by	BK
Map author	JC

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Kilometers

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- Study area

Wetlands

- Dampland (seasonally waterlogged basin)
- Estuary (shoreline and peripheral)
- Estuary (waterbody)
- Floodplain (seasonally inundated flat)
- Paluslope (seasonally waterlogged slope)
- Palusplain (seasonally waterlogged flat)
- Sumpland (seasonally inundated basin)
- Major watercourses
- Minor watercourses
- Lakes

Important wetlands

- Blackwood River (Lower Reaches) and Tributaries System
- Gingilup-Jasper Wetland System

Figure 3-6
Surface hydrology

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4 METHODS

The survey was conducted in accordance with the following guidelines and standards:

- Environmental Factor Guideline: Terrestrial fauna (EPA 2016a)
- Technical Guidance: Terrestrial vertebrate fauna surveys for Environmental Impact Assessment (EPA 2020)
- Survey guidelines for Australia's Threatened birds. Guidelines for detecting birds listed as Threatened under the Environment Protection and Biodiversity Conservation Act 1999 (DEHWA 2010)
- Survey guidelines for Australia's Threatened mammals. Guidelines for detecting mammals listed as Threatened under the Environment Protection and Biodiversity Conservation Act 1999 (DSEWPaC 2011)
- 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) (DAWE 2022)
- Scoring system for the assessment of foraging value of vegetation for Black-Cockatoos (Bamford 2021)
- Significant impact guidelines for the vulnerable western ringtail possum (Pseudocheirus occidentalis) in the southern Swan Coastal Plain, Western Australia. Nationally threatened species and ecological communities, EPBC Act policy statement 3.10 (DEWHA 2009b)
- Background paper to EPBC Act Policy Statement 3.10 - Significant impact guidelines for the vulnerable western ringtail possum (Pseudocheirus occidentalis) in the southern Swan Coastal Plain, Western Australia (DEWHA 2009a).

4.1 DESKTOP REVIEW

Searches of several biological databases (at 10 km or 40 km buffer) were undertaken to identify and prepare a list of terrestrial vertebrate fauna that may occur within the study area (Table 4-1). A literature search was conducted for accessible reports for biological surveys conducted within 40 km of the study area to build on the lists developed from the database searches (Table 4-2).

Table 4-1 Database searches conducted for the desktop review

Database	Target group/s	Search coordinates and extent
Protected Matters Search Tool (DCCEEW 2023a)	EPBC Act listed Threatened fauna and Migratory species	Study area plus a 10 km buffer
DBCA Threatened and Priority Fauna Database (DBCA 2023c)	Threatened and Priority Fauna	Study area plus a 10 km buffer
Dandjoo Biodiversity Data Repository (DBCA 2023a)	Fauna records	Study area plus a 10 km buffer
Birdlife Birdata (Birdlife Australia 2023)	Avifauna	Study area plus a 10 km buffer
Index of Biodiversity Surveys for Assessment (IBSA) database (IBSA 2023) for nearby survey reports and data	Fauna survey records and data	Study area plus a 40 km buffer

Table 4-2 Survey reports included in the desktop review

Report author	Survey description	Project
LEC (1990)	Comprehensive fauna survey	Heavy minerals mine Beenup
Biota (2009)	Windfarm survey	Milyeannup wind farm terrestrial fauna survey
Ninox (2011)	Monitoring of waterbirds and vertebrate fauna	Beenup Mineral Sands Mine site 2005 - 2011
Litoria Ecoservices (2016)	Level 1 fauna assessment, Level 1 terrestrial vertebrate fauna	Expansion of recreational facilities at Gloucester Park, Margaret River
Litoria Ecoservices (2017)	Western Ringtail Possum habitat assessment	Augusta Boat Harbour to Dead Finish Pathway Project
ELM (2017)	Fauna assessment	Lot 2602 McDonald Road, Karridale Flora and Fauna Assessment
Harewood (2018)	Targeted vertebrate fauna survey assessment	Turner Caravan Park – Augusta – Fauna Assessment
Ecosystem Solutions (2020)	Fauna significance assessment	Margaret River Senior High School

4.2 FIELD SURVEY

4.2.1 Survey timing

Field surveys were undertaken over 3 phases, an initial survey in August 2023 which focused on sampling wetland habitats in winter to account for rainfall and inundated conditions, followed by a second survey in December 2023 sampling all habitats and when access was better due to evaporation of seasonal wetlands. The third phase was over the spring-summer 2024-2025 period where 14 additional field trips were completed in response to the results of phases 1 and 2 and the first year of the BBRAS survey (Phoenix 2025a). Field survey activities and dates for each phase of the current survey are provided in Table 4-3.

The separate BBRAS conducted for the Project (Phoenix 2025a) was undertaken over 2 years with each site typically achieving between 8 and 14 sample events per phase from autumn 2023 to summer 2025. Those results are referenced where relevant in this report and distinguished from the current survey results.

Table 4-3 Survey dates

Phase	Season	Dates	Task
1	Winter	28-31 August 2023	Habitat assessments and mapping of wetland areas, fauna sampling focused on wetland habitats/fauna (waterbirds and frogs)
2	Summer	6-13 December 2023	Habitat assessments of remaining habitats, fauna sampling of all habitats, targeted surveys for significant species (Western Ringtail Possum, black cockatoos, Australasian Bittern), potential breeding tree assessment
3	Spring	24 and 28 October, 18 and 25, 29 November 2024	Black cockatoo nesting/roosting surveillance, audio recordings for black cockatoos
		27-29 November 2024	Additional potential breeding tree assessment
	Summer	2, 9, 11-12 and 16 December 2024, 6 and 13 January 2025	Black cockatoo nesting/roosting surveillance, audio recordings for black cockatoos
		4-5, 13 and 17 December 2024, 6 and 13 January 2025	Western Ringtail Possum nocturnal searches

4.2.2 Field methods

Field methods for the Basic and Targeted fauna survey included:

- broad fauna habitat assessment (see 4.2.2.1)
- active diurnal searches (4.2.2.2)
- avifauna censusing (4.2.2.3)
- bat echolocation recordings (4.2.2.4)
- targeted survey for black cockatoos (4.2.2.5)
- targeted survey for Western Ringtail Possum (4.2.2.6)
- targeted survey for Australasian Bittern (4.2.2.7).

Sampling was conducted at a total of 151 sites across all survey phases, with work undertaken at each site ranging from habitat descriptions through to multiple sampling methods (Figure 4-1; Table 4-4). Opportunistic records were made at a further 63 locations (Appendix 1).

4.2.2.1 Broad fauna habitat assessment

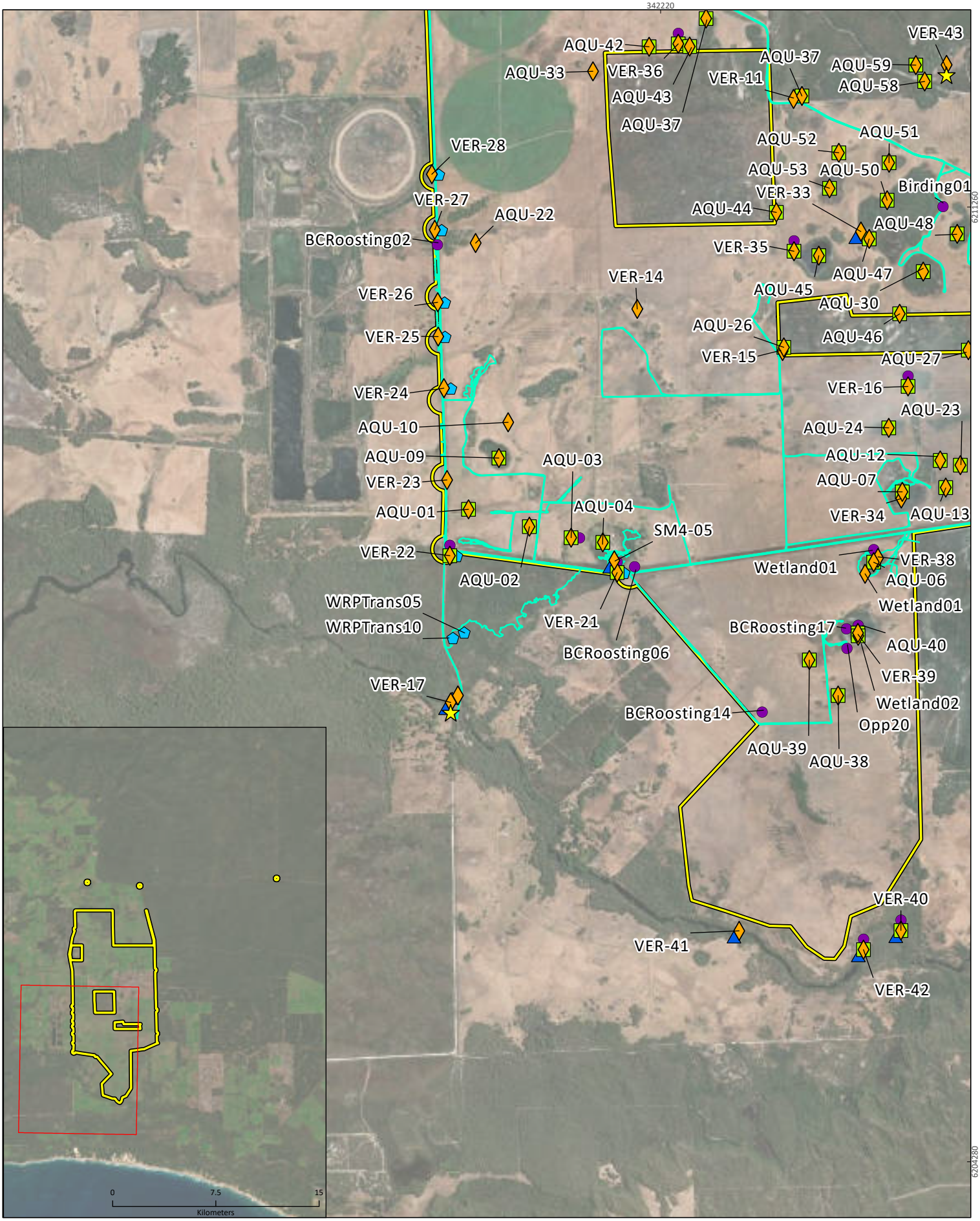
Initial habitat characterisation was undertaken using various remote geographical tools, including aerial photography (Google Earth®), land system maps and topographic maps. Habitats with the potential to support significant terrestrial fauna species were identified based on known habitats of such species within the Warren and Jarrah Forest bioregions. Tentative sites were selected for the terrestrial fauna survey to represent all habitat types. Site selection was informed by the team who had conducted the (Phoenix 2025a) prior to mobilisation of the Basic fauna survey. Final survey site selection was conducted after ground-truthing of site characteristics.

At the broadest scale, site selection considered aspect, topography, and land systems. At the finer scale, consideration was given to proximity to water bodies (wetlands, drainage lines/creeks), vegetation complexes and condition and soil type. Sites were primarily chosen to represent the best example of distinct habitats within the broader habitat associations of the study area with a focus on

significant species identified in the desktop review. Habitat descriptions and characteristics were recorded at 121 locations (Table 4-4; Appendix 2).

In August 2023 the Augusta-Walpole Geomorphic wetlands boundary file was taken into the field and boundaries of the sumplands and damplands reviewed and adjusted as necessary. The resultant polygon set was then incorporated into the vegetation and fauna habitat mapping. Following the fauna and flora field surveys, vegetation units mapped for the Project (Phoenix 2025b) were reinterpreted to define and map fauna habitats. Vegetation types were grouped by their structure (e.g. woodland versus shrubland), dominant plant species and a range of attributes (e.g. presence of hollows or surface water) with respect to the utility they provide for fauna species; as such plant species composition may differ. Three wetland habitat types were delineated based on vegetation and geomorphology.

Habitat value for 4 targeted significant species was considered further, as part of targeted species surveys (detailed in sections 4.2.2.5 and 4.2.2.6).



SynergyRED
Proposed wind farm in Scott River

Project No	1583
Date	16/04/2025
Drawn by	BK
Map author	KC

0 0.5 1
Kilometers

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- Study area
- Tracks

Site type

- Audio recording
- Avifauna census
- Nocturnal searches
- Active diurnal searches
- Site description
- Ultrasonic recording

Figure 4-1a
Survey sites

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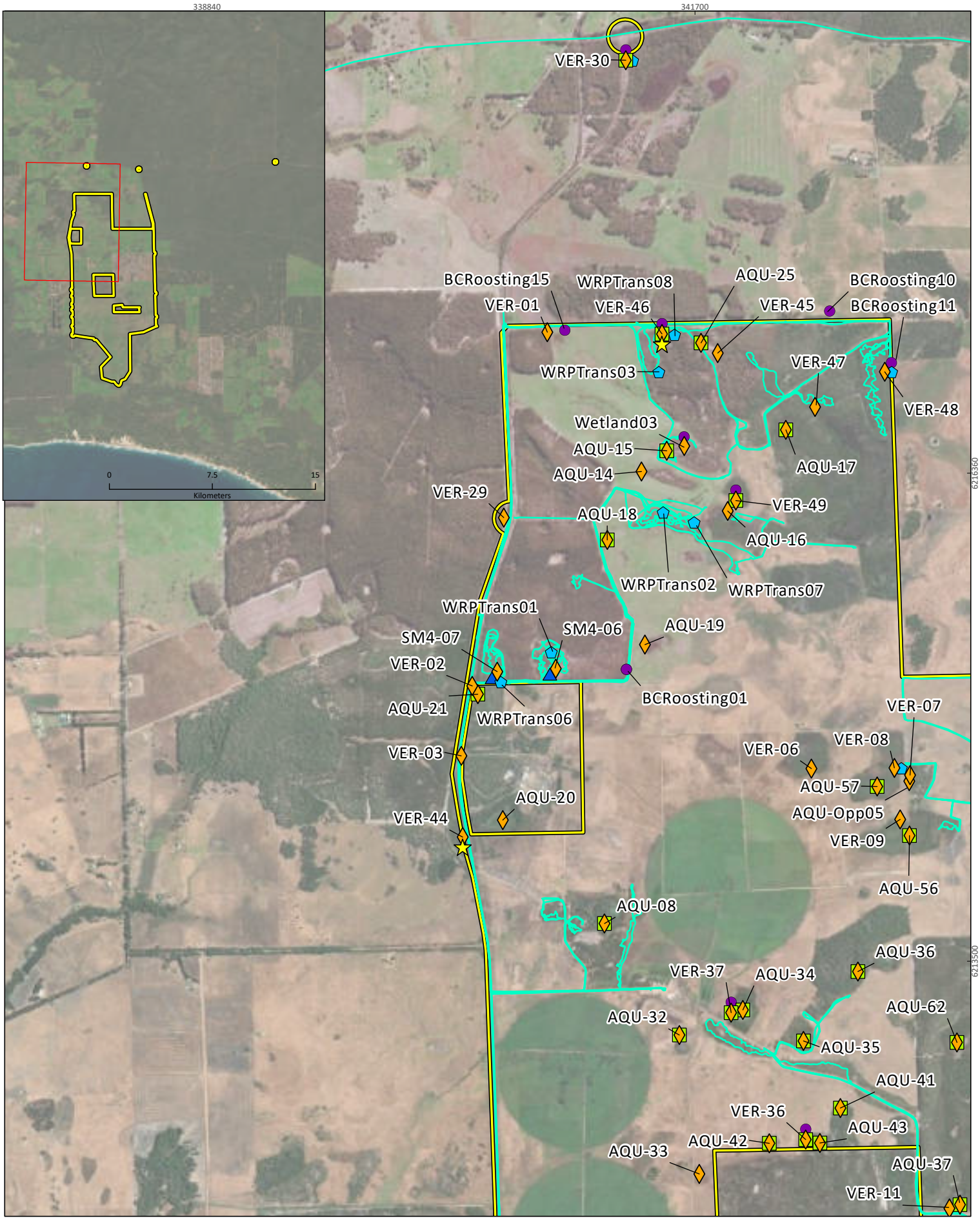

SynergyRED
Proposed wind farm in Scott River

Project No	1583
Date	16/04/2025
Drawn by	BK
Map author	KC

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Kilometers

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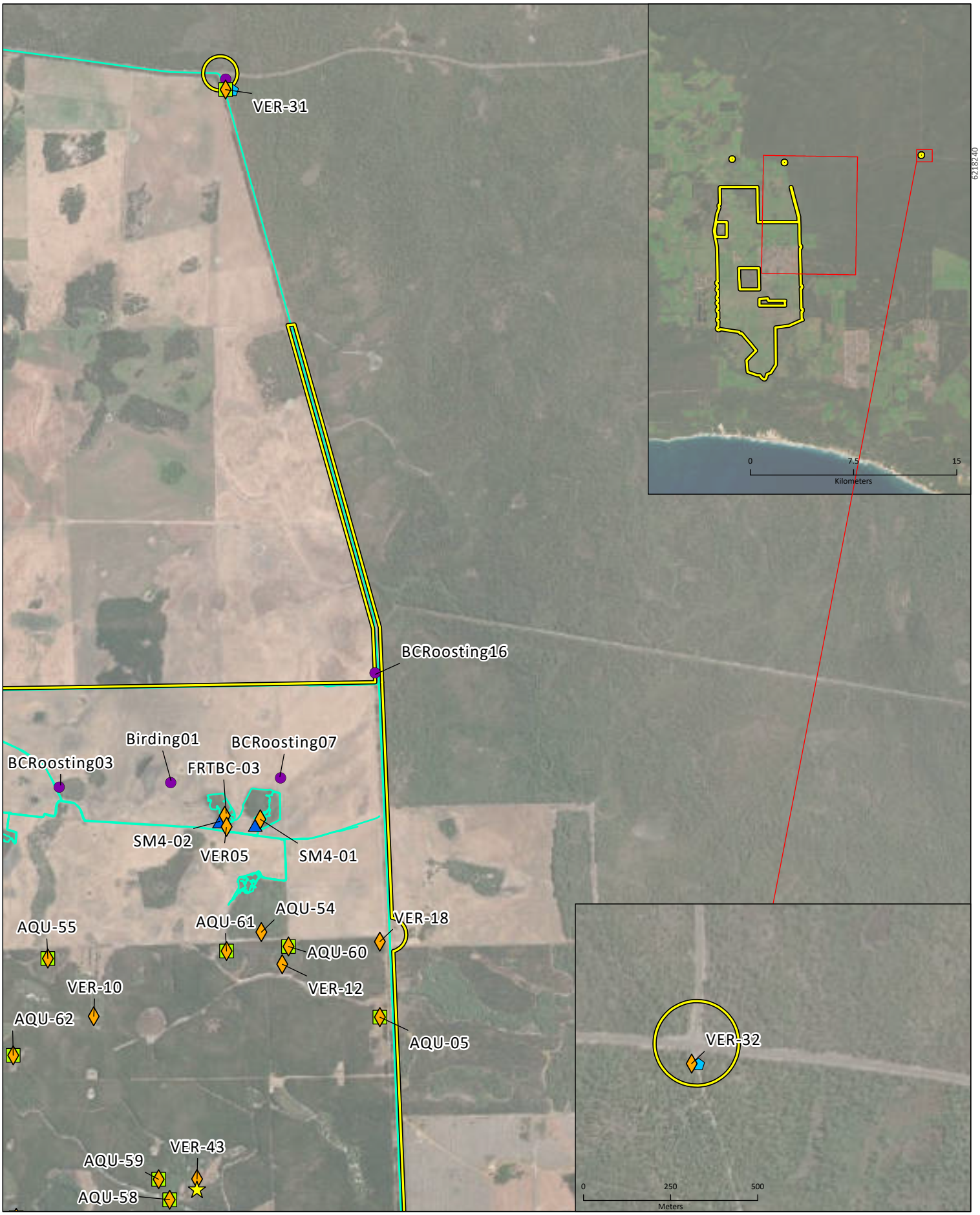
Study area
Tracks

Site type

Audio recording
Avifauna census
Nocturnal searches
Active diurnal searches
Site description
Ultrasonic recording

Figure 4-1b
Survey sites

PHOENIX ENVIRONMENTAL SCIENCES



SynergyRED
Beenup Wind Farm

Project No	1583
Date	17/04/2025
Drawn by	BK
Map author	KC

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Kilometers

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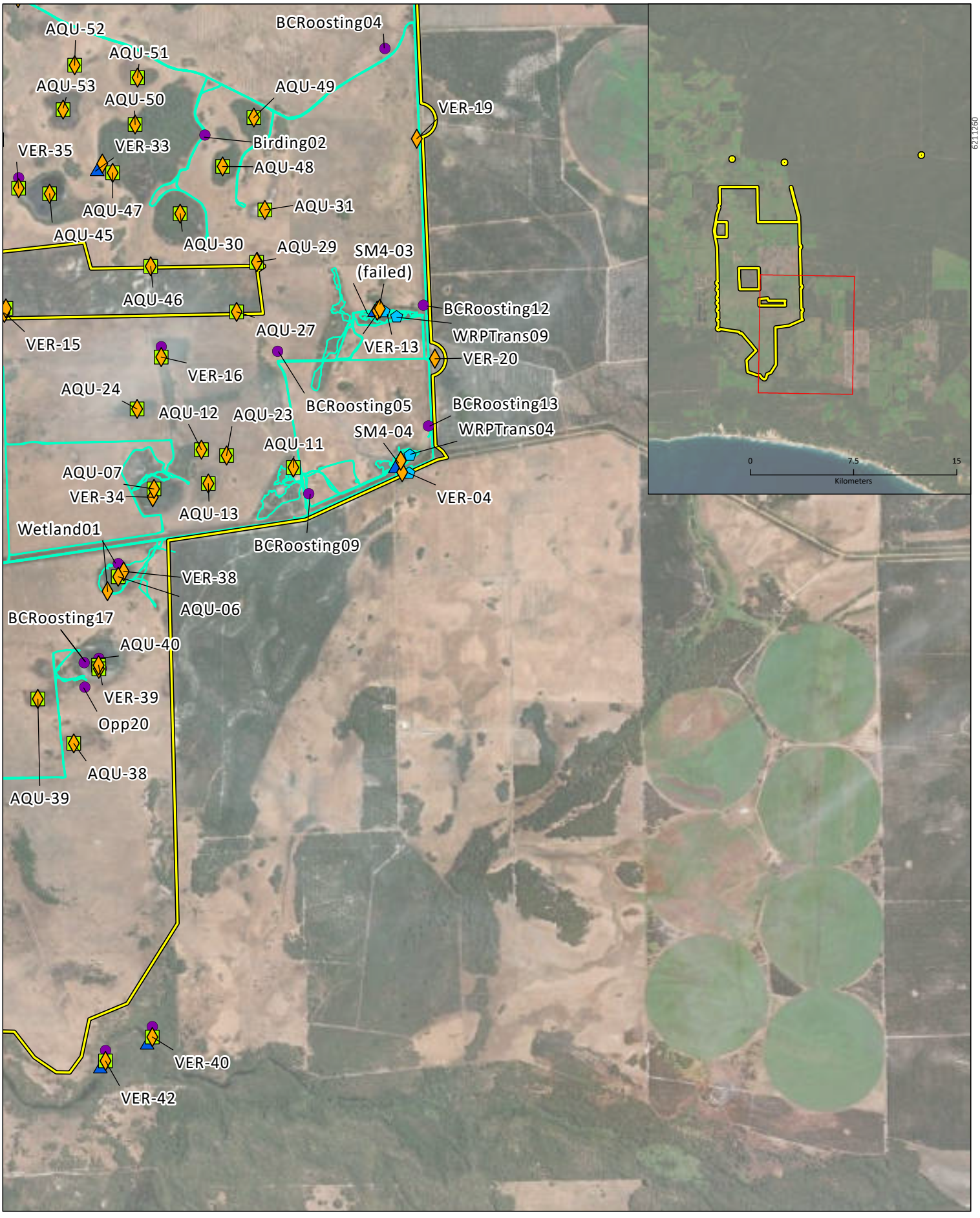
Study area
Tracks

Site type

Audio recording
Avifauna census
Nocturnal searches
Active diurnal searches
Site description
Ultrasonic recording

Figure 4-1c
Survey sites

PHOENIX ENVIRONMENTAL SCIENCES



SynergyRED
Proposed wind farm in Scott River

Project No	1583
Date	16/04/2025
Drawn by	BK
Map author	KC

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Kilometers

1:28,600 (at A4) GDA 1994 MGA Zone 50

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Study area
Tracks

Site type

Audio recording
Avifauna census
Nocturnal searches
Active diurnal searches
Site description
Ultrasonic recording

Figure 4-1d

Terrestrial fauna survey sites

PHOENIX
ENVIRONMENTAL SCIENCES

Table 4-4 Survey sites and effort

Site name	Phase	Site description	Active searches diurnal (min.)	Avifauna census (min.)	Audio recording (nights)	Bat echo. recording (nights)	Nocturnal searches for WRP (min.)	BC roosting/ breeding surveillance (min.)
AQU-01	1	1	40					
AQU-02	1	1	40					
AQU-03	1	1	40					
AQU-04	1	1	40					
AQU-05	1	1	40					
AQU-06	1	1	40					
AQU-07	1	1	40					
AQU-08	1	1	40					
AQU-09	1	1	40					
AQU-10	1	1						
AQU-11	1	1	40					
AQU-12	1	1	40					
AQU-13	1	1	40					
AQU-14	1	1						
AQU-15	1	1	40					
AQU-16	1	1						
AQU-17	1	1	40					
AQU-18	1	1	40					
AQU-19	1	1	40					
AQU-20	1	1						
AQU-21	1	1	40					
AQU-22	1	1						
AQU-23	1	1	40					
AQU-24	1	1	40					
AQU-25	1	1	40					
AQU-26	1	1	40					
AQU-27	1	1	40					
AQU-28	1	1	40					
AQU-29	1	1						
AQU-30	1	1	40					
AQU-31	1	1	40					
AQU-32	1	1	40					
AQU-33	1	1						
AQU-34	1	1	40					
AQU-35	1	1	40					
AQU-36	1	1	40					
AQU-37	1	1	40					
AQU-38	1	1	40					
AQU-39	1	1	40					

Site name	Phase	Site description	Active searches diurnal (min.)	Avifauna census (min.)	Audio recording (nights)	Bat echo. recording (nights)	Nocturnal searches for WRP (min.)	BC roosting/ breeding surveillance (min.)
AQU-40	1	1	40					
AQU-41	1	1	40					
AQU-42	1	1	40					
AQU-43	1	1	40					
AQU-44	1	1	40					
AQU-45	1	1	40					
AQU-46	1	1	40					
AQU-47	1	1	40					
AQU-48	1	1	40					
AQU-49	1	1	40					
AQU-50	1	1	40					
AQU-51	1	1	40					
AQU-52	1	1	40					
AQU-53	1	1	40					
AQU-54	1	1						
AQU-55	1	1	40					
AQU-56	1	1	40					
AQU-57	1	1	40					
AQU-58	1	1	40					
AQU-59	1	1	40					
AQU-60	1	1	40					
AQU-61	1	1	40					
AQU-62	1	1	40					
Mowl01	1	1			1			
VER-01	2	1						
VER-02	2	1						
VER-03	2	1						
VER-04	2	1					60	
VER-05	2	1						
VER-06	2	1						
VER-07	2	1						
VER-08	2	1					60	
VER-09	2	1						
VER-10	2	1						
VER-11	2	1						
VER-12	2	1						
VER-13	2	1					60	
VER-14	2	1						
VER-15	2	1						
VER-16	2	1	60	60				

Site name	Phase	Site description	Active searches diurnal (min.)	Avifauna census (min.)	Audio recording (nights)	Bat echo. recording (nights)	Nocturnal searches for WRP (min.)	BC roosting/ breeding surveillance (min.)
VER-17	2	1			3	2		
VER-18	2	1						
VER-19	2	1						
VER-20	2	1						
VER-21	2	1	40	40			60	
VER-22	2	1	40	40			20	
VER-23	2	1						
VER-24	2	1					20	
VER-25	2	1					20	
VER-26	2	1					20	
VER-27	2	1					20	
VER-28	2	1					20	
VER-29	2	1						
VER-30	2	1	40	40			60	
VER-31	2	1	40	40			40	
VER-32	2	1					40	
VER-33	2	1			4			
VER-34	2	1						
VER-35	2	1	30	40				
VER-36	2	1	40	40				
VER-37	2	1	40	40				
VER-38	2	1						
VER-39	2	1	40	40				
VER-40	2	1	40	50	4			
VER-41	2	1			4			
VER-42	2	1	40	40	4			
VER-43	2	1				4		
VER-44	2	1				4		
VER-45	2	1						
VER-46	2	1	40	40		4		
VER-47	2	1						
VER-48	2	1					60	
VER-49	2	1	40	40				
BCRoosting01	3							240
BCRoosting02	3							60
BCRoosting03	3							120
BCRoosting04	3							210
BCRoosting05	3							65
BCRoosting06	3							150
BCRoosting07	3							90

Site name	Phase	Site description	Active searches diurnal (min.)	Avifauna census (min.)	Audio recording (nights)	Bat echo. recording (nights)	Nocturnal searches for WRP (min.)	BC roosting/ breeding surveillance (min.)
BCRoosting09	3							65
BCRoosting10	3							105
BCRoosting11	3							80
BCRoosting12	3							60
BCRoosting13	3							60
BCRoosting14	3							60
BCRoosting15	3							70
BCRoosting16	3							70
BCRoosting17	3							90
Birding01	3							120
Birding02	3							130
Birding03	3							220
Opp20	3			20				
SM4-01	3	1			39			
SM4-02	3	1			39			
SM4-03	3	1			0[1]			
SM4-04	3	1			40			
SM4-05	3	1			34			
SM4-06	3	1			13			
SM4-07	3	1			38			
Wetland01	3	1		20				
Wetland02	3			80				
Wetland03	3	1		40				
WRPTrans01	3						35	
WRPTrans02	3						35	
WRPTrans03	3						30	
WRPTrans04	3						50	
WRPTrans05	3						20	
WRPTrans06	3						35	
WRPTrans07	3						40	
WRPTrans08	3						20	
WRPTrans09	3						50	
WRPTrans10	3						20	
Total effort			**45 hours**	**12 hours**	**223 nights**	**14 nights**	**15 hours**	**34 hours**
Total # sites	**152**	**121**	**67**	**17**	**12**	**4**	**24**	**19**

[1]No effort as audio recording failed.

4.2.2.2 Active diurnal searches

Active diurnal searches ('foraging') were undertaken at 67 sites throughout the study area during Phase 1 and 2, representing 45 hours of survey (Figure 4-1; Table 4-4). Active searches primarily targeted diurnal herpetofauna and mammals from direct sightings and secondary evidence.

Searches were undertaken in any observable microhabitats considered likely to support mammals, reptiles and amphibians. Additionally, sites were selected based on habitat suitability for conservation significant fauna species. Techniques included: overturning logs, searching beneath the bark of trees, investigating dead trees and logs, investigating burrows, investigating infrastructure ruins or disused building materials such as tin piles and identifying any secondary evidence including tracks, diggings, scats, fur or sloughs (shed skins), predation or feeding sites, and nest sites.

Waterbirds and frogs were recorded at each wetland visited to document wetland associated species in particular.

4.2.2.3 Avifauna censusing

Twenty-minute avifauna censuses were undertaken at 13 sites in Phase 2 and at 4 sites in Phase 3, totalling 12 hrs (Figure 4-1; Table 4-4). Each census was confined to a single habitat type (up to 2 ha) to collect assemblage data for that habitat, with all main habitat types sampled. The birding surveys occurred throughout the day with a focus on periods of higher activity around sunrise and sunset. Sampling consisted of bird recordings from visual sightings and call recognition.

Avifauna observations were also recorded opportunistically while other field work was being completed, including observations made during travel and active searches. Additional bird assemblage data was collected by audio recorders set out to target Australasian Bittern (see section 4.2.2.7) and black cockatoos (see section 4.2.2.5.5).

Additional bird censusing was conducted for the BBRAS (Phoenix 2025a), consisting of morning and afternoon 30-minute censuses at 14 sites over 4 seasons (autumn 2023 – summer 2024) in year 1 and 14 sites over 3 seasons (spring 2024 – autumn 2025) in year 2, as per the methods suggested in Brett Lane and Associates (2005). An additional 6 sites were also sampled up to twice each in September and December at the Hardy Inlet (Blackwood River) to investigate and compare Migratory bird usage there during the period of wetland inundation in the study area and coincided with the start of year 2 sampling in the study area. Site locations from the BBRAS are presented in Appendix 3. Species assemblage and significant species records from the BBRAS are noted in this report for completeness. Full details on the BBRAS bird surveys are presented in Phoenix (2025a).

4.2.2.4 Bat echolocation recordings

Song Meter SM4 recording devices were used to record bat echolocation calls at 4 sites (Figure 4-1). Recording devices were deployed for a total of 14 nights, for ~15 continuous hours per night (Table 4-4).

Echolocation recordings were also completed for one night each quarter, at each of the 14 sites investigated in year 1 of the BBRAS. As with avifauna, the species recorded in the BBRAS are noted in this report, but the full details of the quarterly bat sampling are reported in Phoenix (2025a).

4.2.2.5 Targeted surveys for black cockatoos

Targeted survey work for WA's 3 Threatened black cockatoo species, Baudin's Cockatoo (*Zanda baudinii;* VU), Carnaby's Cockatoo (*Zanda latirostris*; EN) and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*; VU), included breeding and roosting habitat assessments, surveys for

evidence of breeding /roosting activity, audio recordings and finally foraging habitat value analysis based on the evidence from the field surveys.

4.2.2.5.1 Breeding habitat assessment

Breeding habitat for the 3 Threatened black cockatoo species consists of woodland or forest; however, they will also breed in areas of former woodland or forest habitats which consist of now fragmented patches of habitat and/or isolated trees. Breeding habitat is defined in DAWE (2022) as "trees of species known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow" (referred to as potential nesting trees; PNTs). Suitable DBH is 500 mm for most tree species known to support breeding hollows and 300 mm for Salmon Gum and Wandoo (DSEWPaC 2012b). Known breeding tree species in the Jarrah Forest and Warren bioregions include *Corymbia calophylla* Marri, *Eucalyptus marginata* Jarrah, *E. rudis* Flooded Gum, *E. diversicolor* Karri, *E. megacarpa* Bullich, *E. patens* Blackbutt, *E. salmonophloia* Salmon Gum and *E. wandoo* Wandoo. Trees with a DBH >500mm were recorded where they had a hollow with potential to develop into a suitable nesting hollow.

The location of PNTs in Jarrah/Marri woodland and other prospective habitats was recorded on GPS. All native vegetation remnants containing PNTs were thoroughly searched, and all paddocks were visited to detect any isolated paddock trees.

Tree species identifications were conducted in the field using tree descriptors and photographs. Trees that met the required DBH measurement were inspected for hollows and were assessed for nesting suitability. Both live and dead PNTs were catalogued and inspected. In addition to tree species, the following attributes were recorded:

- DBH (mm)
- number of hollows
- hollow height (m)
- hollow diameter (mm)
- hollow type/category
- presence of feral bees
- presence of other species using a hollow
- evidence of use by black cockatoo species.

PNTs with hollows were inspected from ground level using binoculars. A pole camera was available for further inspection of hollows if needed (e.g. evidence of breeding visible); however, this was not utilised as no trees with hollows were observed to have recent breeding activity or were greater than 8 m above ground level and could not be accessed. PNTs were later classified according to the following parameters, which largely align with the definition of DAWE (2022):

- Known nesting tree – trees which contain a hollow where a black cockatoo has been directly recorded breeding, or has evidence of use, such as chewings/scratches around the hollow and/or feathers and wood chips in the base.
- Suitable nesting tree – trees with suitable DBH for the species, containing a suitable hollow, but with no evidence of use.
- Potential nesting tree – any tree with a DBH >500mm that do not currently contain a suitable nesting hollow (DCCEEW 2024f, h).

A suitable nest hollow is defined as – A hollow in a live tree, with a near vertical alignment, >300 mm in internal diameter and >5 m above the ground (DCCEEW 2024f, h).

The PNT dataset, as well as the botanical quadrat-level dataset (Phoenix 2025a), long-term audio data and nocturnal roosting survey results were all used to rate the remnants in the study area in terms of their potential to support breeding and roosting for each species.

4.2.2.5.2 Roosting assessment

Presence of known roosting species was recorded, and evidence of night roosting was searched for (i.e. by the presence of clipped leaves, branches and droppings under suitable trees) while undertaking active diurnal searches (section 4.2.2.2), the PNT assessment (section 4.2.2.5.1), night roosting/breeding surveillance (section 4.2.2.5.4) and audio recordings (section 4.2.2.5.5). Known roosting tree species for the 3 black cockatoo species in the Jarrah Forest and Warren bioregion include *Corymbia calophylla* Marri, *E. marginata* Jarrah, *E. rudis* Flooded Gum, *E. diversicolor* Karri, *E. megacarpa* Bullich, *E. patens* Blackbutt, *E. salmonophloia* Salmon Gum and *E. wandoo* Wandoo, introduced eucalypts (e.g. blue gum) and introduced pines.

4.2.2.5.3 Foraging habitat assessment

Assessment of foraging habitat quality for each black cockatoo species was undertaken based on 2 scoring methods; the federal government scoring tool DAWE (2022) and Bamford (2021) scoring tool, an alternative scoring method that provides more effective analysis by consideration of site attributes (such as plant species composition and vegetation condition), site context and stocking rate. The intended outcome of both methods is a score out of 10 to inform the EPBC Act Offset Assessment Guide (DSEWPaC 2012a, c), with 10 being highest quality foraging habitat and one being lowest.

The DAWE (2022) scoring tool starts at a score of 10 and then subtracts points for the following attributes: foraging potential, connectivity, proximity to breeding and/or roosting, and impact from plant disease (see Appendix 4 for the scoring template).

The Bamford (2021) method calculates values on 3 functional aspects that are then summed to get the total score (see Appendix 5 for the scoring framework):

- Site condition – determine a score out of 6 for the vegetation composition, condition and structure, ideally based on site-specific floristic data applied to each fauna habitat polygon.
- Site context – determine a score out of 3 for the context of the entire study area, i.e. within 15 km of the study area how much native vegetation remains and is there known roosting or breeding occurring.
- Species stocking rate – determine a score out of one for species density, i.e. essentially a presence-absence determination whereby a score of one is applied across the entire study area where the species is seen or reported regularly and/or there is abundant foraging evidence.
- Determine total score – may require moderation for context and species density with respect to the site condition (vegetation) score. Pine plantations are also considered as a special case for foraging value.

Observations of foraging habitat quality and feeding residues were recorded throughout the study area during the survey. This information, together with the fauna habitat and vegetation association mapping, desktop data, site contextual information and floristic data (i.e. the presence of known food plant species used by each black cockatoo species) was used to calculate foraging habitat quality for each black cockatoo species in accordance with the Bamford (2021) scoring method. Floristic data was obtained from the flora and vegetation survey conducted for the Project (Phoenix 2025b).

A Structured Query Language script was written to intersect all known black cockatoo food plant species (and their respective height (m) and cover values (%)) with vegetation type, vegetation condition and fauna habitat type, so that every polygon could be systematically and consistently scored.

The scores from the Bamford (2021) assessment were categorised into high (8 or above), moderate (5–7) and low (1-4) quality ratings to give an overall picture of where the higher value foraging habitat was throughout the study area.

4.2.2.5.4 Night roosting/breeding surveillance

Surveillance for evidence of black cockatoo night roosting and/or breeding activity was undertaken at 19 sites over 11 evenings during spring 2024 and summer 2024/2025 (Table 4-4). Zoologists arrived on site approximately 45 minutes prior to sunset and were positioned at different locations around the periphery of the study area to detect any black cockatoos moving into the study area to roost and/or tend to chicks at the nest. Each person stayed at their location until it was too dark to see. Only black cockatoos were recorded. The sites were chosen based on their proximity to good condition vegetation containing PNT, and in consideration of visibility across the landscape and likely flight paths.

4.2.2.5.5 Audio recordings

Seven audio recorders were established during Phase 3 to detect any breeding over the spring-summer that may not have been detected during the crepuscular roosting and breeding surveillance (Figure 4-1). One recorder was damaged by cattle and no data obtained. Sites were selected in remnants that contained PNTs with hollows and black cockatoo records.

The recorders ran for between 13 and 40 nights per site (see Table 4-4), they were set to record continuously from 30 minutes prior to sunrise to 30 minutes after sunset each day.

The resultant audio data was processed in the Kaleidoscope software package. Recordings of black cockatoos were identified and extracted using a classifier based on previous recordings of each species. The 2 *Zanda* species cannot be confidently distinguished and were thus recorded as 'white-tailed black cockatoo', whereas Forest Red-tailed Black Cockatoo is readily distinguishable from the 2 white-tailed species.

The dataset was then analysed in terms of 'detections', where a detection was considered to be any recordings occurring within 15 minutes of one another. For example, if FRTBC was detected at 0600 am, 0605 am and 0615 am at a site, the data was lumped and considered a single detection, and the length of that visitation (minutes) calculated. If 2 recordings of a single species, at a single site were more than 15 minutes apart they were treated as 2 distinct detections. A single call at a site was treated as a 'flyover'. Calls after sunset were to be treated as potential roosting or breeding records, that would require follow up.

4.2.2.6 Targeted surveys for Western Ringtail Possum

4.2.2.6.1 Nocturnal searches

Nocturnal searches were undertaken for the species at 14 sites in Phase 2 and 10 sites in Phase 3 following completion of the PNT assessment (Table 4-4). The nocturnal searches were between 20-60 minutes in duration each and took place between sunset and 11 pm for a total of 15 hrs (Table 4-4).

The nocturnal searches comprised using handheld and head torches to inspect trees and tall shrubs for animal movement, eye shine, on foot (Phase 2 and 3) and by vehicle (Phase 2 only). These took place in areas of suitable high-quality habitat, being woodland habitats dominated by Jarrah and Marri, and stands of Peppermint, which were typically degraded and lacked understorey. While the focus of the nocturnal sampling was on Western Ringtail Possum, any species detected was recorded.

Evidence of Western Ringtail Possum (*Pseudocheirus occidentalis*; CR) presence (e.g. dreys, hollows, scats and tracks) was sought during the active diurnal searches in Phase 1 and 2 (section 4.2.2.2; Table 4-4).

4.2.2.6.2 Habitat assessment

A habitat quality assessment was undertaken using the scoring tool of DCCEEW (2024c). The scoring tool considers 3 elements (refer to Appendix 6 for detailed method):

- habitat quality (0-3) – all elements indicative of suitable habitat for the species, i.e. evidence of occupation, nests/dreys and hollows, canopy cover, ground cover for shelter, fire history, and evidence of predators
- site context (0-3) – connectivity of habitat in the study area and surrounding landscape, management tenure of site
- species stocking rate (0-4) – records of species on site; as WRP was recorded during the survey all polygons were assigned a score of 4 as a starting point.

The assessment was conducted spatially, whereby each polygon (n = 1,129) in the fauna habitat dataset was scored against the criteria. As such the raw scores cannot be presented in this report in tabular form and are instead provided as part of the spatial dataset accompanying this report.

The scores were categorised into high (8 or above), moderate (5-7.5) and low (0.5-4.5) quality ratings to give an overall picture of where the higher value habitat was in the study area for Western Ringtail Possum.

4.2.2.7 Targeted survey for Australasian Bittern

The Australasian Bittern (*Botaurus poiciloptilus*; EN) was formerly widespread in the south-west of WA, from Moora in the north to Cape Arid in the east. However, since the 1980's the species has dramatically declined and has only been recorded from a handful of locations, including wetlands along the south coast from Augusta, east to Cape Arid. Habitat critical to survival of the species is described in the species recovery plan as (DBCA 2018a):

> "generally large, fresh to moderately brackish wetlands with pH levels ranging from 5.5 to 8.5. Extensive areas of water plants, especially rushes, reeds and sedges, provide habitat for the bitterns and support abundant prey (Pickering 2013). Shallow water, less than 30 cm deep with a low to medium density of water plants mixed with, or near short fine sedges are favoured for foraging while higher density emergent vegetation is preferred for nesting (Jaensch 1982; A. Clarke, pers.2017)."

Targeted surveys were conducted for Australasian Bittern (*Botaurus poiciloptilus*; EN) as the species is known from the Hardy Inlet south-west of the study area, and the Gingilup/Quitchup/Jasper wetlands to the south-east. Many of the wetlands in the study area were considered to have the potential to support the species based on the habitat preferences described in the species recovery plans (DBCA 2018a; DCCEEW 2022b).

The most effective survey methodology for detecting presence of Australasian Bitterns is by using passive acoustic surveys via autonomous recording units (ARUs) (Birdlife Australia 2024a). Currently there is no survey technique available to irrefutably prove that Australasian Bitterns are absent from a site, and as such habitat assessments are critical.

Five ARUs were deployed, for a total of 19 nights in Phase 2 (December 2023) in suitable habitat for Australasian Bittern (Figure 4-1; Table 4-4), the aim of detecting males vocalising with their "booming" calls. The devices were set to actively record from dusk to dawn each day. Sampling was conducted during the breeding season (between mid-October and late-March) in accordance with Birdlife Australia (2024a).

While the ARUs targeted Australasian Bittern, the recordings were also analysed to detect other bird species, supplementing the assemblage data from the avifauna censusing.

4.2.3 Likelihood of occurrence assessment

Following completion of all field surveys, the likelihood of occurrence for each significant fauna species identified in the desktop review but not recorded in the field was assessed and assigned to one of the following categories:

- Recorded – species recorded within the study area by previous or current survey.
- Likely – study area within current known range of species, nearby (within 10 km) recent records (within the last 10 years), suitable habitat within the study area.
- Possible – study area within current known range of species, suitable or potentially suitable habitat within the study area, no nearby recent/relatively recent desktop records or species has a wide home range and utilises a wide variety of habitats.
- Possible (rare) –for Migratory listed species whose preferred/core foraging habitat is not present, but the study area contains marginal or rarely used habitat; species is rare in the region; occurs in very low numbers.
- Unlikely – study area outside current known range of species, no suitable habitat present in study area, very old desktop records only.

4.2.4 Survey personnel

The personnel involved in the survey are listed in Table 4-5. All survey work was carried out under a Fauna taking (biological assessment) licence (BA27000943) issued by DBCA under the BC Act.

Table 4-5 Survey personnel

Name	Qualifications	Role/s
Jarrad Clark	BSc. (Env. Mgt)	Project management, fieldwork, reporting
Karen Crews	BSc. (Env. Biol.) (Hons)	Reporting
Kerryn Fox	Ma. Vet. Sci. (Wildlife Health and Con.), BSc. (Cons. and Wildlife Bio., and Marine Bio.)	Senior Zoologist, fieldwork, reporting
Patrick Williams	Ma. (Env. Sci.) and BSc. (Cons. Bio. and Marine and Fresh. Bio.)	Zoologist, fieldwork, reporting
Brigitte Kovar	Ma. (Geospatial Intelligence)	GIS specialist, mapping
Dr Boyd Wykes	BSc. (Hons.) Zoology and PhD (Monash University); Dip Ed. (Murdoch University)	Fieldwork (BBRAS; Phoenix 2025a)
Andrew Green	Bachelor of Arts, BirdLife Accredited (monitoring and camera deployment)	Fieldwork

5 RESULTS

5.1 DESKTOP REVIEW

5.1.1 Desktop fauna assemblage

The desktop review identified records of 262[3] vertebrate taxa within the desktop search extent, 256 native and 6 introduced species (Appendix 7). The list comprised 12 amphibians, 24 reptiles, 198 birds and 28 mammals (Table 5-1).

Table 5-1 Summary of terrestrial fauna desktop results

Class	Native	Introduced	Total
Amphibia	12	0	12
Reptilia	24	0	24
Aves	197	1	198
Mammalia	23	5	28
Total	**256**	**6**	**262**

5.1.2 Significant fauna

Seventy-one significant vertebrate fauna were identified in the desktop review, including 41 EPBC Act and/or BC Act Threatened species (Table 5-2; Figure 5-1). One species, South-western Brush-tailed Phascogale, is listed as CD under the BC Act and one other species, Peregrine Falcon, is listed as OS under that act. Another 9 species are listed as Priority by DBCA and 45 species are listed as Migratory under the EPBC Act and/or BC Act, including several of the Threatened and one of the Priority species (Table 5-2).

Three black cockatoo species were the only significant vertebrate fauna species to have been recorded within the study area (Table 5-2) prior to the survey:

- Baudin's Cockatoo (*Zanda baudinii*; EN) – one record each from the WFA and western RIA
- Carnaby's Cockatoo (*Zanda latirostris*; EN) – 18 records, all from the WFA
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*; VU) – 2 records from WFA.

The study area is within the modelled distribution for all 3 black cockatoo species (DAWE 2022). It is within the predicted breeding range for Baudin's but in the non-breeding range for Carnaby's, as defined in DAWE (2022). No breeding habitat map is provided for Forest Red-tailed Black Cockatoo in DAWE (2022), but the distribution map shows it is 'likely to occur' in the study area. According to FloraBase records (WA Herbarium 1998–), the study area occurs within the distribution of several known tree species used by black cockatoos for breeding and roosting in the Jarrah Forest and Warren bioregions (see 4.2.2.5), including *Corymbia calophylla* Marri, *E. marginata* Jarrah, *E. diversicolor* Karri, *E. megacarpa* Bullich and *E. patens* Blackbutt.

Based on the desktop assessment, no known black cockatoo nesting sites are present in the study area, or wider desktop search area, with no known black cockatoo breeding sites returned in the

[3] Count excludes indet. black cockatoo rows in Appendix 7 (i.e. *Calyptorhynchus* sp., *Calyptorhynchus*/*Zanda* sp. and *Zanda* sp.) as these records will belong to one of the 3 black cockatoo species listed in the appendix. Other indet. taxa detected in the desktop review have been excluded from Appendix 7 as they can be attributed to other species already listed.

Threatened and Priority Fauna database search (DBCA 2023c). According to DBCA (2023c), the nearest known roost site (from 2019, count of 19 white-tails) is located roughly 4.5 km north of the WFA (2.8 km north of the westernmost RIA). Another is located roughly 11.5 km north-west of the WFA but has no bird count data. Specific locations are not shown on Figure 5-1 due to DBCA conditions of data supply.

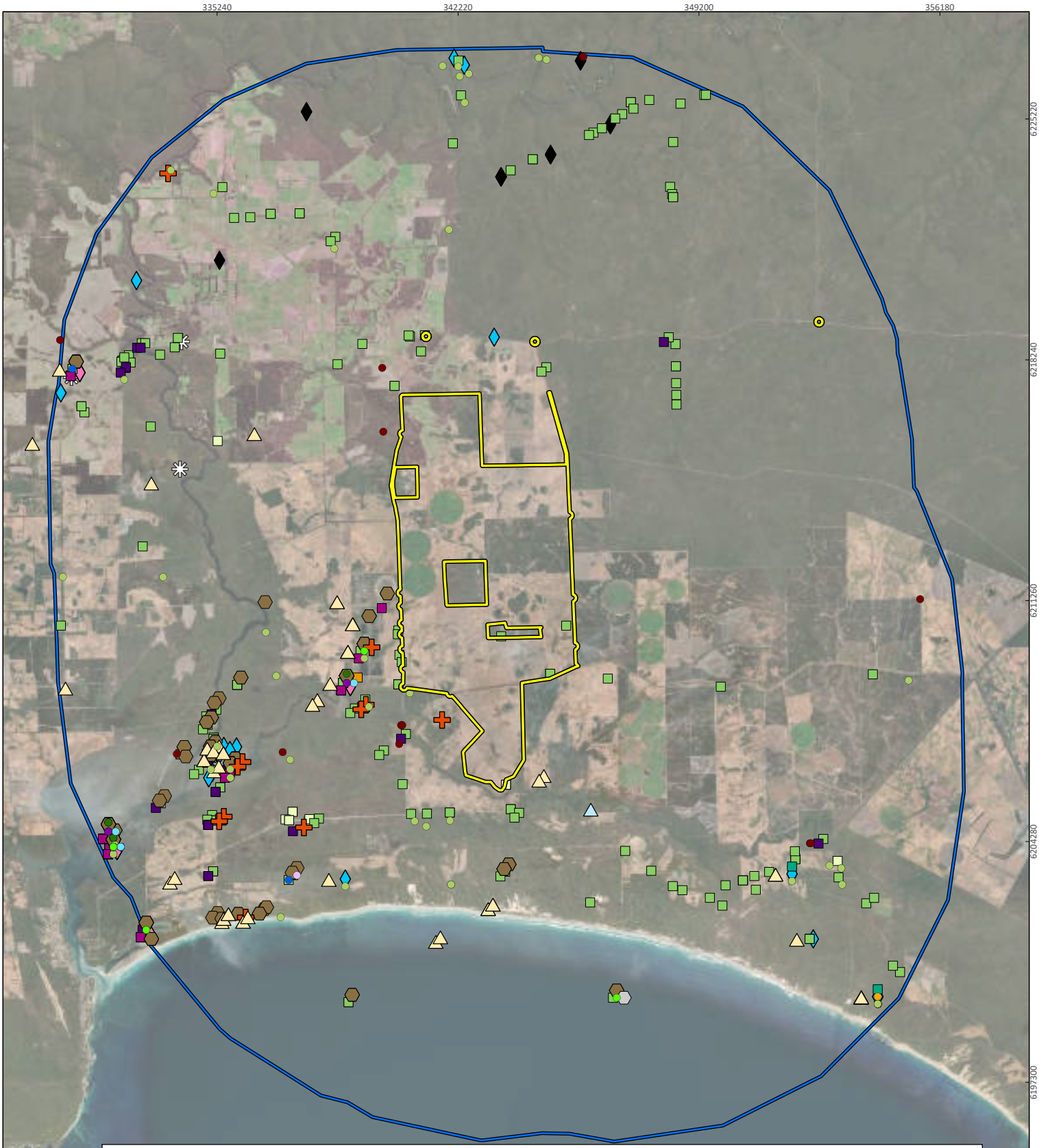
Biota (2009) recorded Western Ringtail Possum dreys in their survey area, located roughly 8.5 km east of the study area and several records of the species were returned in the DBCA Threatened and Priority Fauna database within 10 km of the study area. The species was also recorded by Litoria Ecoservices (2017), Harewood (2018) and ELM (2017).

Table 5-2 Significant vertebrate fauna identified in the desktop review

Species	Vernacular	Status
Amphibia (2)		
Anstisia alba	White-bellied Frog	CR (EPBC & BC Acts)
Anstisia vitellina	Orange-bellied Frog	VU (EPBC & BC Acts)
Reptilia (1)		
Elapognathus minor	Short-nosed Snake	P2 (DBCA list)
Aves (58)		
Actitis hypoleucos	Common Sandpiper	Mig. (EPBC & BC Acts)
Anarhynchus bicinctus	Double-banded Plover	Mig. (EPBC & BC Acts)
Anarhynchus leschenaultii	Greater Sand Plover	VU/Mig. (EPBC Act); VU (BC Act)
Anarhynchus mongolus	Siberian Sand Plover	EN/Mig. (EPBC Act); EN (BC Act)
Anous tenuirostris melanops	Australian Lesser Noddy	VU (EPBC Act); EN (BC Act)
Apus pacificus	Fork-tailed Swift	Mig. (EPBC & BC Acts)
Ardenna carneipes	Flesh-footed Shearwater	VU/Mig. (BC Act)
Ardenna grisea	Sooty Shearwater	Mig. (BC Act)
Arenaria interpres	Ruddy Turnstone	VU/Mig. (EPBC Act); Mig. (BC Act)
Botaurus poiciloptilus	Australasian Bittern	EN (EPBC & BC Acts)
Calidris acuminata	Sharp-tailed Sandpiper	VU/Mig. (EPBC Act); Mig. (BC Act)
Calidris alba	Sanderling	Mig. (EPBC & BC Acts)
Calidris canutus	Red Knot	VU/Mig. (EPBC Act); EN (BC Act)
Calidris falcinellus	Broad-billed Sandpiper	Mig. (EPBC & BC Acts)
Calidris ferruginea	Curlew Sandpiper	CR/Mig. (EPBC Act); CR (BC Act)
Calidris melanotos	Pectoral Sandpiper	Mig. (EPBC & BC Acts)
Calidris ruficollis	Red-necked Stint	Mig. (EPBC & BC Acts)
Calidris tenuirostris	Great Knot	CR/Mig. (EPBC Act); CR (BC Act)
Charadrius cucullatus	Hooded Plover/Dotterel	P4 (DBCA list)
Diomedea amsterdamensis	Amsterdam Albatross	EN/Mig. (EPBC Act); CR/Mig. (BC Act)
Diomedea dabbenena	Tristan Albatross	EN/Mig. (EPBC Act); CR/Mig. (BC Act)
Diomedea epomophora	Southern Royal Albatross	VU/Mig. (EPBC & BC Acts)
Diomedea exulans	Wandering Albatross	VU/Mig. (EPBC & BC Acts)

Species	Vernacular	Status
Diomedea sanfordi	Northern Royal Albatross	EN/Mig. (EPBC Act; BC Act)
Falco peregrinus	Peregrine Falcon	OS (BC Act)
Halobaena caerulea	Blue Petrel	VU (EPBC Act)
Hydroprogne caspia	Caspian Tern	Mig. (EPBC & BC Acts)
Leipoa ocellata	Malleefowl	VU (EPBC & BC Acts)
Limosa lapponica	Bar-tailed Godwit	Mig. (EPBC & BC Acts)
Limosa limosa	Black-tailed Godwit	EN/Mig. (EPBC Act); Mig. (BC Act)
Macronectes giganteus	Southern Giant Petrel	EN/Mig. (EPBC Act); Mig. (BC Act)
Macronectes halli	Northern Giant Petrel	VU/Mig. (EPBC Act); Mig. (BC Act)
Motacilla cinerea	Grey Wagtail	Mig. (EPBC & BC Acts)
Numenius madagascariensis	Eastern Curlew	CR/Mig./CR (EPBC Act; BC Act)
Numenius phaeopus	Whimbrel	Mig. (EPBC & BC Acts)
Onychoprion anaethetus	Bridled Tern	Mig. (EPBC & BC Acts)
Oxyura australis	Blue-billed Duck	P4 (DBCA list)
Pandion haliaetus	Osprey	Mig. (EPBC & BC Acts)
Phoebetria fusca	Sooty Albatross	VU/Mig. (EPBC Act); EN/Mig. (BC Act)
Pluvialis fulva	Pacific Golden Plover	Mig. (EPBC & BC Acts)
Pluvialis squatarola	Grey Plover	VU/Mig. (EPBC Act); Mig. (BC Act)
Pterodroma mollis	Soft-plumaged Petrel	VU (EPBC Act)
Stercorarius pomarinus	Pomarine Skua (Pomarine Jaeger)	Mig. (EPBC & BC Acts)
Sternula nereis nereis	Fairy Tern	VU (EPBC & BC Acts)
Thalassarche carteri	Indian Yellow-nosed Albatross	VU/Mig. (EPBC Act); EN/Mig. (BC Act)
Thalassarche cauta	Shy Albatross	VU/Mig. (EPBC & BC Acts)
Thalassarche chlororhynchos	Atlantic Yellow-nosed Albatross	VU/Mig. (BC Act)
Thalassarche impavida	Campbell Albatross	VU/Mig. (EPBC & BC Acts)
Thalassarche melanophris	Black-browed Albatross	VU/Mig. (EPBC Act); EN/Mig. (BC Act)
Thalasseus bergii	Greater Crested Tern	Mig. (EPBC & BC Acts)
Tringa brevipes	Grey-tailed Tattler	Mig. (EPBC & BC Acts) P4 (DBCA list)
Tringa glareola	Wood Sandpiper	Mig. (EPBC & BC Acts)
Tringa nebularia	Common Greenshank	EN/Mig. (EPBC Act); Mig. (BC Act)
Tringa stagnatilis	Marsh Sandpiper	Mig. (EPBC & BC Acts)
Tyto novaehollandiae novaehollandiae	Masked Owl (southwest)	P3 (DBCA list)
Zanda baudinii	Baudin's Cockatoo	EN (EPBC & BC Acts)
Zanda latirostris	Carnaby's Cockatoo	EN (EPBC & BC Acts)
Mammalia (10)		
Bettongia penicillata ogilbyi	Woylie	EN/CR (EPBC Act; BC Act)
Dasyurus geoffroii	Chuditch	VU (EPBC & BC Acts)

Species	Vernacular	Status
Falsistrellus mackenziei	Western False Pipistrelle	P4 (DBCA list)
Hydromys chrysogaster	Water-rat	P4 (DBCA list)
Isoodon fusciventer	Quenda	P4 (DBCA list)
Myrmecobius fasciatus	Numbat	EN (EPBC & BC Acts)
Notamacropus irma	Western Brush Wallaby	P4 (DBCA list)
Phascogale tapoatafa wambenger	South-western Brush-tailed Phascogale	CD (BC Act)
Pseudocheirus occidentalis	Western Ringtail Possum	CR (EPBC & BC Acts)
Setonix brachyurus	Quokka	VU (EPBC & BC Acts)



SynergyRED
Proposed wind farm in Scott River

Project No	1583
Date	17/04/2025
Drawn by	BK
Map author	JC

0 2.5 5
Kilometers

1:150,180 (at A4) GDA 1994 MGA Zone 50

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Study area
10 km desktop search extent

Figure 5-1

Desktop records of significant vertebrate fauna

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5.1.3 Migratory shorebird movements

Figure 5-2 and Figure 5-3 display the individual and overall abundance, respectively, for 9 shorebird species for the Cape to Cape region based on data from ALA (2024). Only 9 species were returned where reliable record dates were available; however, these represent a good range of Migratory shorebirds in terms of preferred habitat and feeding preferences.

The individual species and aggregate abundance, diversity and activity levels (number of records) for Migratory shorebirds increases significantly after September each year, with abundance activity levels peaking in October and diversity peaking in January.

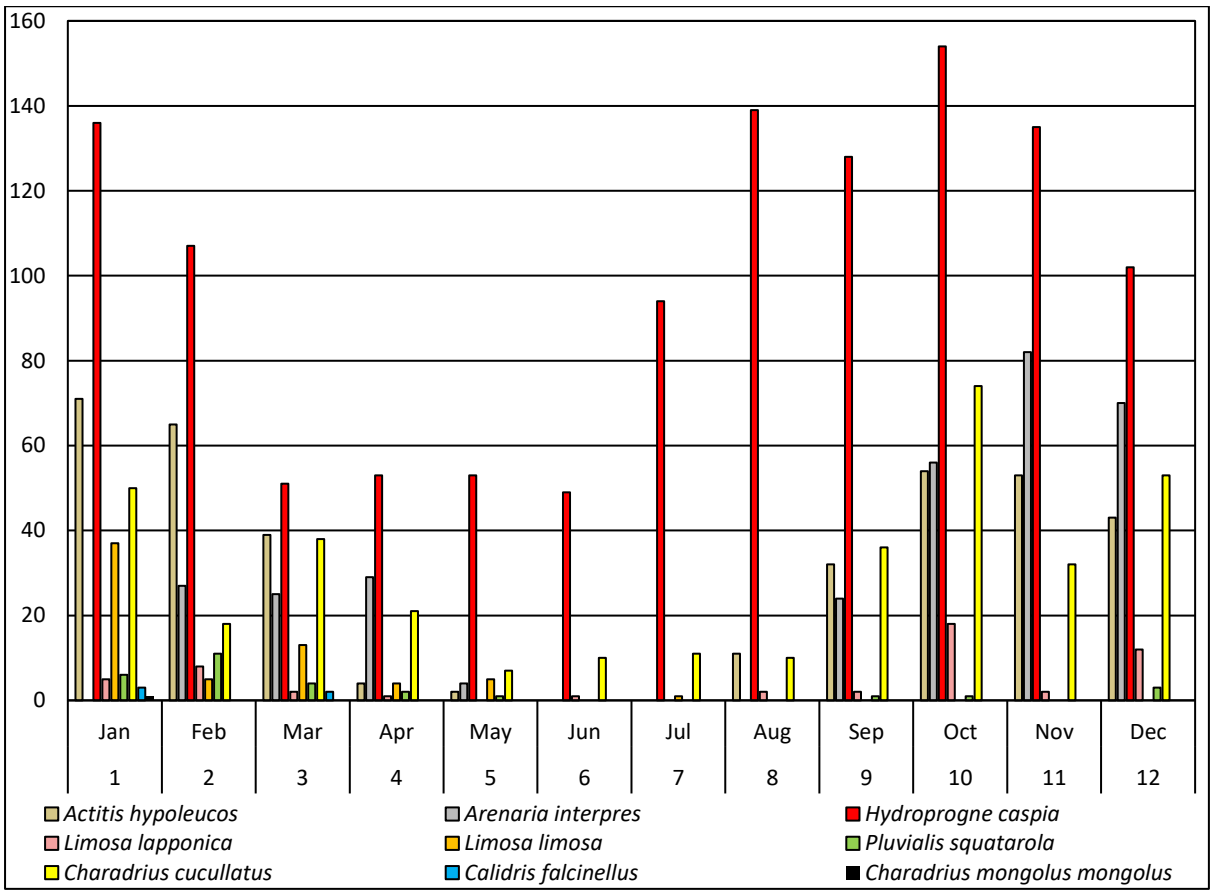


Figure 5-2 Abundance per species per month for 9 Migratory shorebird species from the Cape to Cape region (ALA 2024)

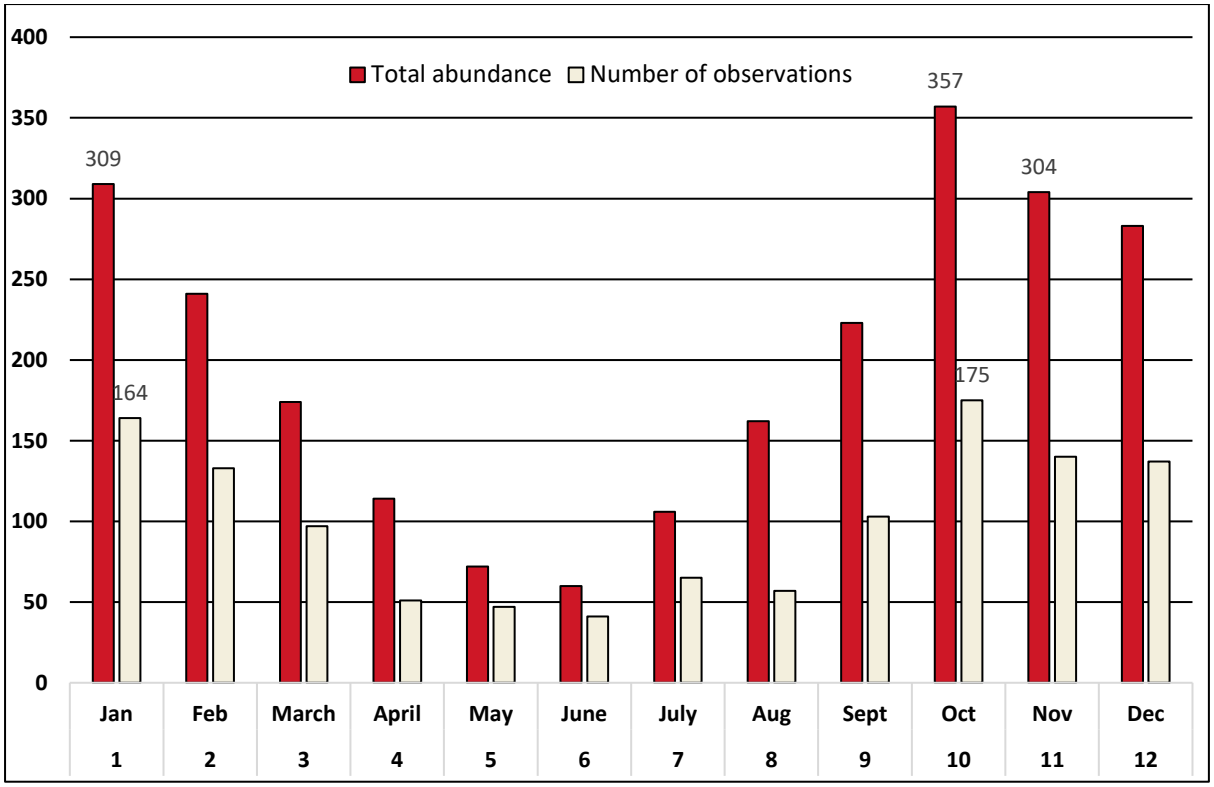


Figure 5-3 Aggregate abundance per month for 9 Migratory shorebird species from the Cape to Cape region (ALA 2024)

5.2 FIELD SURVEY

5.2.1 Habitats

Ten fauna habitat types were identified in the study area, including 3 wetland habitats, 2 woodlands and 5 highly modified habitats (Table 5-3; Figure 5-4).

The wetlands were a mix of Seasonally inundated paperbark woodlands, shrublands and sedgelands, collectively covering 378 ha (9.7%) of the study area, and were patchily distributed throughout (Figure 5-4). Condition of the wetlands was variable, with the paperbark woodlands and shrublands generally in better condition than the sedgelands, which tended to be heavily grazed. The majority of wetlands are seasonally inundated (i.e. ephemeral) and relatively shallow with water level typically less than 1 m, except for a large wetland south of Governor Broome Road and a wetland cluster in the northern part of the WFA that persisted into summer, suggesting that they have the potential to be permanently inundated (i.e. perennial); these are demarcated as 'potentially permanently inundated' in Figure 5-4. The southern wetland may be an expression of a perched aquifer as it is in relatively poor condition floristically having been accessed by cattle for many years and thus is not shaded and must have a high evaporation rate.

Woodlands were in varying condition throughout the study area. These were categorised into Marri-Jarrah-Peppermint woodland and degraded Open woodland of Peppermint trees, together covering 420.9 ha (10.8%) of the study area. They occurred within remnant vegetation patches in the WFA and as roadside vegetation, sometimes adjacent to wetland habitats (Figure 5-4).

The highly modified habitats comprised cleared areas, dams and plantations. The study area is predominantly (68.7%) cleared areas, mainly represented by paddocks that contain little to no native vegetation. While cleared areas usually offer no fauna habitat value, the paddocks in the study area become inundated in winter, essentially acting as flooded grasslands, with some degraded sumplands

also present. These attract and provide seasonal foraging habitat for several water birds, such as mountain ducks and ibis. Carnaby's Cockatoo was also observed foraging on the ground, within the paddock grasslands.

Two large Bluegum plantations are present in the WFA, and a small strip of Pine plantation occurs along Scott River Road on the western boundary of the WFA (Figure 5-4).

Excluding the cleared areas that represent roads, the central and eastern RIAs intersect Marri-Jarrah-Peppermint woodland that is contiguous with much larger intact remnant vegetation (Figure 5-4). The westernmost RIA was predominantly within a Seasonally inundated shrubland.

Most habitat in the study area is of low-quality with respect to the general flora assemblage (i.e. cleared areas, plantations, the degraded Open woodland of Peppermint trees, and dams). There are however several small – moderate sized remnants of high-quality habitat remaining, some of which have been fenced off to prevent cattle access. The study area is also largely surrounded by land set aside for conservation and forestry (see section 3.5; Figure 3-4). Notwithstanding the above, habitat value for black cockatoos and Western Ringtail Possum is assessed seperately in section 5.2.4).

Table 5-3 Extent and description of each fauna habitat in the study area

Habitat type	Site/s	Description	Extent (ha) and % of study area	Representative photograph
Wetland habitats				
Seasonally inundated paperbark woodland (wetland)	AQU-06, AQU-07, AQU-08, AQU-14, AQU-15, AQU-16, AQU-34, AQU-35, AQU-36, AQU-40, AQU-41, AQU-42, AQU-43, AQU-44, AQU-45, AQU-48, AQU-49, AQU-53, AQU-54, AQU-55, AQU-58, AQU-59, AQU-60, AQU-62, BCRoosting17, Dugite02, Opp01, TigerSnake01, VER-12, VER-34, VER-35, VER-36, VER-37, VER-38, VER-39, VER-49, Wetland01, Wetland02, Wetland03	Seasonally inundated sumplands of paperbark woodlands, flora dominated by *Lemna disperma, Melaleuca rhaphiophylla, Taxandria juniperina, Taxandria inundata, Melaleuca preissiana, Callistachys lanceolata* and *Leptocarpus scariosus*. This wetland habitat is typically less floristically diverse (56 species recorded) than the shrublands, but far more diverse than the sedgelands. The tree canopy ranges from open to closed. Water is typically <50 cm deep and tannin stained, often with Duckweed at the surface and aquatic plants present. Large, old trees often present some with hollows being used by waterbirds. Habitat enhanced for fauna with log debris but can be plentiful or absent. Many examples fenced to prevent stock access. Four examples possibly perennially inundated (Figure 5-4).	144.9 ha (3.7%)	

Habitat type	Site/s	Description	Extent (ha) and % of study area	Representative photograph
Seasonally inundated sedgeland (wetland)	AQU-11, AQU-12, AQU-13, AQU-17, AQU-18, AQU-23, AQU-28, AQU-29, AQU-31, AQU-37, AQU-46, AQU-51, AQU-52, AQU-Opp01, VER-43, VER-47	Seasonally inundated sumplands of open to dense mixed sedges, dominated by *Leptocarpus roycei*, *Machaerina juncea, Leptocarpus scariosus, Lepidosperma longitudinale* and *Melaleuca incana* subsp. *incana*. With or without occasional stands of paperbark (*Melaleuca rhaphiophylla*) typically at the periphery. Low floristic diversity. Often grazed at margins with associated weed encroachment. Can be relatively closed or with extensive open water areas. Typically inhabited by numerous frogs, but bird presence generally limited to a handful of waterbirds that choose to nest in dense sedge stands that can form large homogenic stands.	107.0 ha (2.7%)	
Seasonally inundated shrubland (wetland)	AQU-09, AQU-19, AQU-24, AQU-25, AQU-30, AQU-47, AQU-50, AQU-56, AQU-57, BCRoosting15, VER-06, VER-08, VER-09, VER-16, VER-33, VER-45, VER-Opp05	Seasonally inundated sumplands with variable open to sparse shrublands. High floristic diversity (238 species in total). Dominated by *Taxandria inundata, Anarthria scabra, Loxocarya magna, Hypolaena caespitosa, Astartea scoparia, Leptocarpus scariosus*. Often grazed at margins with weed encroachment. Can be relatively closed or with extensive open water areas. Inhabited by numerous frogs. Bird diversity generally greater compared with the 2 other wetland types (sedgelands or woodlands) due to higher diversity of flowering shrubs	126.1 ha (3.2%)	

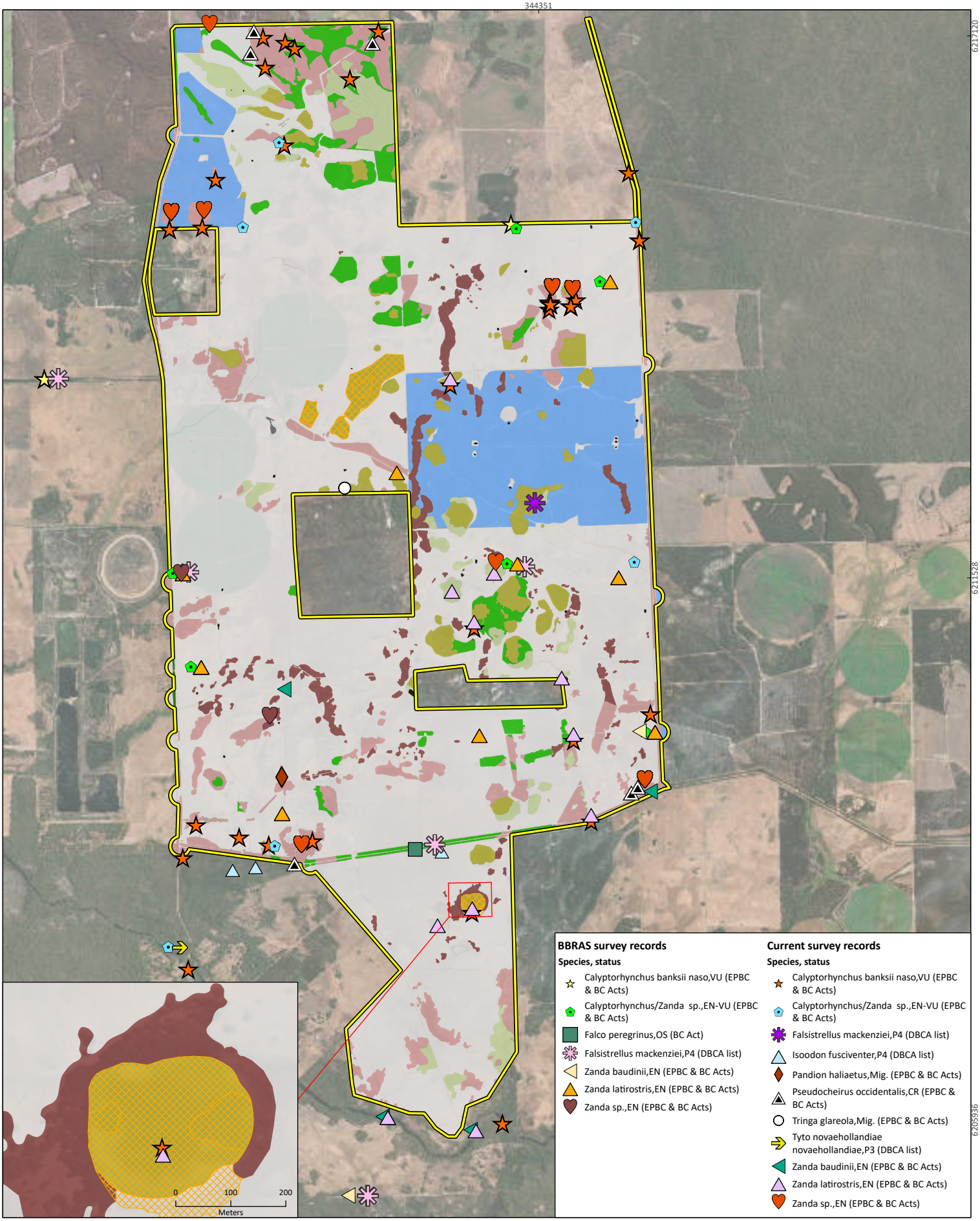
Habitat type	Site/s	Description	Extent (ha) and % of study area	Representative photograph
		present offering a greater diversity of feeding and nesting opportunities. Waterbirds also present in low numbers.		
Woodland habitats				
Marri-Jarrah-Peppermint woodland	AQU-01, AQU-61, AQU-Opp05, BC2024_01, BCForaging, BCRoosting12, BCRoosting13, carnabysCockies02, Cat2024_01, Drey01, Fox2024_01, Fox2024_01, Fox2024_03, Fox2024_04, Fox2024_04, FRTBC-01, FRTBC-02, FRTBC-03, FRTBC-05, FRTBC-06, Opp12, Opp13, Opp14, Opp15, Opp19, Raven01, SM4-01, SM4-02, SM4-04, SM4-05, SM4-06, SM4-07, Tawny01, VER-02, VER-04, VER-05, VER-07, VER-13, VER-19, VER-21, VER-22, VER-23, VER-24, VER-27, VER-28, VER-31, VER-32, VER-44, VER-46, VER-48, VER-Opp02, VER-Opp07, White-tail_Foraging, WRP01, WRPTrans03, WRPTrans04, WRPTrans06, WRPTrans07, WRPTrans08, WRPTrans09	Low to mid open woodlands dominated by *Corymbia calophylla, Eucalyptus marginata* subsp. *marginata, Allocasuarina fraseriana, Agonis flexuosa* var. *flexuosa*, *Machaerina juncea, Taxandria juniperina, Cyathochaeta equitans, Anarthria scabra, Lepidosperma leptostachyum, Platychorda applanata, Gastrolobium formosum* and *Astartea scoparia*. Habitat condition varies greatly depending on grazing history and can have excellent condition understorey through to completely degraded. Structural complexity also varies substantially with some remnants retaining many logs and debris on the floor and others with very little. The best examples are high-quality habitat for a several significant species including the 3 black cockatoo species, Western Ringtail Possum and Quenda.	322.0 ha (8.3%)	

Habitat type	Site/s	Description	Extent (ha) and % of study area	Representative photograph
Open woodland of Peppermint trees (degraded)	Birding03, Opp11, VER-03, VER-10, VER-11, VER-14	Highly modified habitat dominated by a single native species, *Agonis flexuosa* var. *flexuosa*, and a variety of introduced weeds, such as **Rumex acetosella, *Hordeum leporinum and *Lolium rigidum, *Ehrharta longiflora* and **Bromus diandrus*. This habitat represents limited value to most native fauna due to the completely degraded nature of the understorey, and the fact *Agonis flexuosa* var. *flexuosa* rarely forms hollows.	98.9 ha (2.5%)	

Habitat type	Site/s	Description	Extent (ha) and % of study area	Representative photograph
Highly modified habitats				
Cleared	AQU-02, AQU-04, AQU-05, AQU-22, AQU-33, AQU-38, AQU-39, AQU-Opp02, AQU-Opp03, AQU-Opp04, BC Roosting 18, BCRoosting01, BCRoosting03, BCRoosting04, BCRoosting05, BCRoosting06, BCRoosting09, BCRoosting10, BCRoosting10, BCRoosting14, BCRoosting16, Bfalcon, Birding01, Birding02, Fox2024_02, Goanna01,	Cleared areas absent or near absent of native vegetation; agricultural paddocks and roads. May contain isolated paddock trees, generally of Peppermint (*Agonis flexuosa* var. *flexuosa*). Limited value to native fauna. Typically used by birds that tolerate and sometimes thrive in modified environments. Carnaby's Cockatoo observed on 2 occasions feeding on paddock weeds in seed.	2,666.0 ha (68.5%)	

Habitat type	Site/s	Description	Extent (ha) and % of study area	Representative photograph
	KingSkink01, Opp02, Opp03, Opp05, Opp06, Opp07, Opp08, Opp09, Opp10, Opp17, Opp20, Opp22, Opp23, Osprey, VER-Opp01, VER-Opp03, VER-Opp04, VER-Opp06, VER-Opp08, VER-Opp09, WRPTrans02			
Cleared - degraded sumpland	AQU-32	Seasonally inundated sumpland wetland that has been cleared (i.e., now paddock) and is almost completely devoid of native vegetation, excepting occasional isolated sedge plants. This habitat is essentially a highly degraded form of Seasonally inundated sedgeland (wetland) habitat. As such it supports a limited number of native fauna species. Most prominent were frogs and the more degradation tolerant bird species. White-faced heron were regularly seen foraging in this habitat while it was inundated.	8.1 ha (0.2%)	
Dam	AQU-03, AQU-10	Artificial pond or dam with standing water. Typically provides habitat for a handful of waterbirds only, and generally only in the largest examples. One example on Dennis Road was constructed with a sizeable rim and some rocky features affording protection and visibility limited predation and which attracted more birds than elsewhere.	1.7 ha (<0.1%)	

Habitat type	Site/s	Description	Extent (ha) and % of study area	Representative photograph
Bluegum plantation	Shingleback01, VER-01, VER-18, VER-20, VER-29, WRPTrans01	Planted mid woodland of Bluegum (*_Eucalyptus globulus_* subsp. *globulus*). Monoculture which provides limited habitat value for native fauna. Western Grey Kangaroos were abundant, but few other species observed. Carnaby's Cockatoo and Western Ringtail Possum are known to use this habitat type on occasion, but this was not observed in the study area.	415.4 ha (10.7%)	
Pine plantation	BCRoosting02, VER-25, VER-26	Planted open woodland of Pine (*_Pinus_* sp.) plantation. Monoculture which provides limited habitat value for native fauna. Carnaby's Cockatoo are known to feed on *Pinus* sp. but were not observed doing so in the study area. Ninox (2012) observed a flock of Baudin's Cockatoo land in the stand of Pines on Scott River Road (in the study area) in 2006.	1.6 ha (<0.1%)	
		Total	**3,891.6 ha**	



BBRAS survey records

Species, status

- Calyptorhynchus banksii naso,VU (EPBC & BC Acts)
- Calyptorhynchus/Zanda sp.,EN-VU (EPBC & BC Acts)
- Falco peregrinus,OS (BC Act)
- Falsistrellus mackenziei,P4 (DBCA list)
- Zanda baudinii,EN (EPBC & BC Acts)
- Zanda latirostris,EN (EPBC & BC Acts)
- Zanda sp.,EN (EPBC & BC Acts)

Current survey records

Species, status

- Calyptorhynchus banksii naso,VU (EPBC & BC Acts)
- Calyptorhynchus/Zanda sp.,EN-VU (EPBC & BC Acts)
- Falsistrellus mackenziei,P4 (DBCA list)
- Isoodon fusciventer,P4 (DBCA list)
- Pandion haliaetus,Mig. (EPBC & BC Acts)
- Pseudocheirus occidentalis,CR (EPBC & BC Acts)
- Tringa glareola,Mig. (EPBC & BC Acts)
- Tyto novaehollandiae novaehollandiae,P3 (DBCA list)
- Zanda baudinii,EN (EPBC & BC Acts)
- Zanda latirostris,EN (EPBC & BC Acts)
- Zanda sp.,EN (EPBC & BC Acts)

SynergyRED
Proposed wind farm in Scott River

Project No	1583
Date	17/04/2025
Drawn by	BK
Map author	JC

0 0.75 1.5
Kilometers

1:50,450(at A4) GDA 1994 MGA Zone 50

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- Study area

Habitat

- Bluegum plantation
- Cleared
- Cleared - degraded sumpland
- Dam
- Marri-Jarrah-Peppermint woodland
- Open woodland of Peppermint trees (degraded)
- Pine plantation
- Seasonally inundated paperbark woodland (wetland)
- Seasonally inundated sedgeland (wetland)
- Seasonally inundated shrubland (wetland)
- Seasonally inundated paperbark woodland (wetland) - potentally permanently inundated

Figure 5-4a

Fauna habitats and significant fauna records from the field surveys

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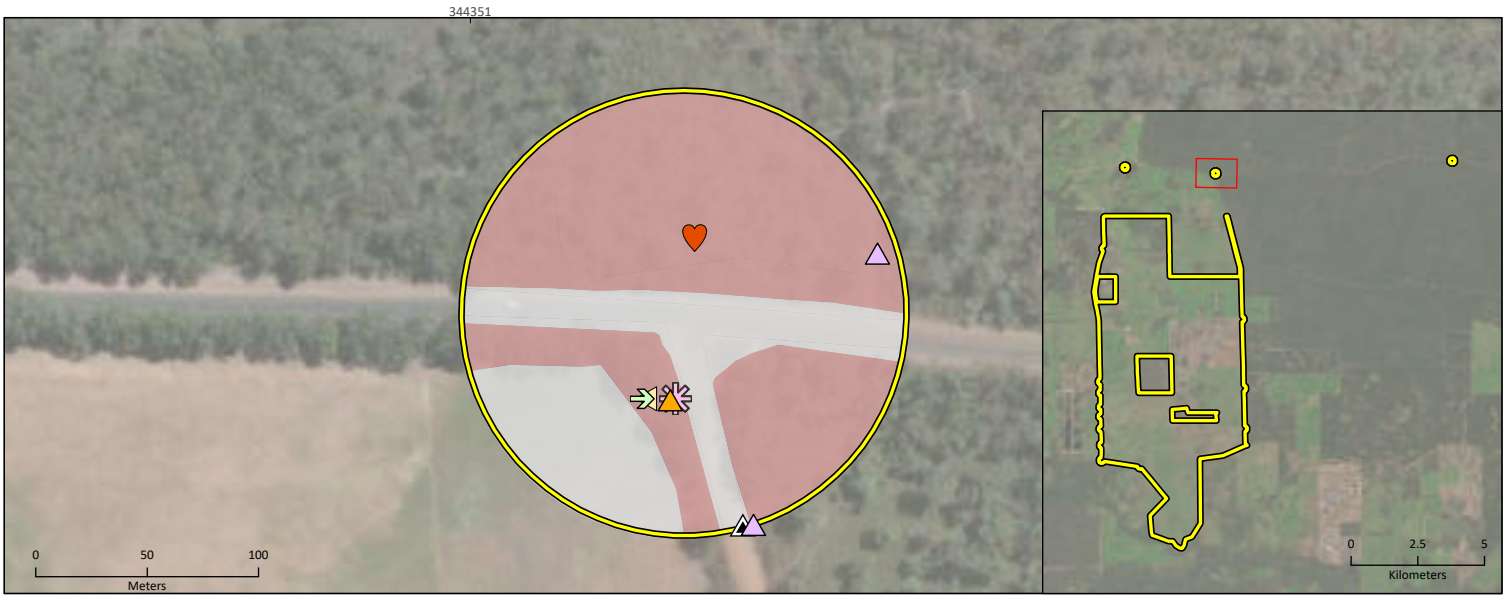

SynergyRED
Proposed wind farm in Scott River

Project No	1583
Date	18/08/2025
Drawn by	BK
Map author	JC

1:3,374 (at A4) GDA 1994 MGA Zone 50

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Study area

Habitat
- Cleared
- Marri-Jarrah-Peppermint woodland
- Seasonally inundated shrubland (wetland)

BBRAS survey records

Species, status
- Falsistrellus mackenziei,P4 (DBCA list)
- Tyto novaehollandiae novaehollandiae,P3 (DBCA list)
- Zanda baudinii,EN (EPBC & BC Acts)
- Zanda latirostris,EN (EPBC & BC Acts)

Current survey records

Species, status
- Pseudocheirus occidentalis,CR (EPBC & BC Acts)
- Zanda latirostris,EN (EPBC & BC Acts)
- Zanda sp.,EN (EPBC & BC Acts)
- Calyptorhynchus banksii naso,VU (EPBC & BC Acts)

Figure 5-4b

Fauna habitats and significant fauna records from the field survey

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5.2.2 Fauna assemblage

A total of 120 vertebrate species were recorded in the Basic and Targeted fauna survey (Appendix 7). The assemblage comprised 9 amphibians (from 3 families), 6 reptiles (from 4 families), 89 birds (from 37 families) and 16 mammals (from 10 families) (Table 5-4; Appendix 7). An additional 16 bird species and one additional bat were recorded in the study area in the BBRAS (Phoenix 2025a) that were not recorded in the current survey (Table 5-4), taking the overall assemblage to 138 species. A further 14 bird species recorded at regional sites in the BBRAS (Appendix 7) have not been included as part of the overall assemblage here as they were not detected in the study area.

The recorded assemblage was roughly 52% of the richness identified in the desktop list (section 5.1.1; Table 5-4). Fifteen species were recorded in the surveys that were not returned in the desktop review, including 2 amphibians (Slender Tree Frog and Sand Frog), one reptile (South-western Long-necked Turtle), 6 birds (Peaceful Dove, Pied Butcherbird, Mistletoebird, Yellow-throated Miner, Jacky Winter and Little Corella) and 6 mammals (dog, cat, pig, Lesser Long-eared Bat, Holt's Long-eared Bat and Greater Long-eared Bat) (Appendix 7).

Seven species from the overall assemblage are introduced, comprising one bird and 6 mammals. Three are feral predators, cat, dog and red fox. Three of the recorded introduced species (dog, cat and pig) were not identified in the desktop review.

Proportionate representation of each class of vertebrates in the recorded assemblage roughly aligns with that of the desktop review, with the dominance of birds being recorded. It also reflects the sampling methods as Basic surveys largely comprise foraging and birding; as birds are more visible and audible, they tend to be detected more readily. The avifauna assemblage was also supplemented by the BBRAS (Phoenix 2024). Amphibians were represented in slightly greater proportion than the desktop list (4.5% of desktop, 6.5% of field records), while reptiles were under-represented (9.5% of desktop, 4.3% of field records).

Agricultural clearing in the study area provides extensive ‘open grassland’ hunting grounds, albeit a modified habitat. These grasslands are interspersed with numerous wetland and bushland remnants that together provide a diversity of habitats that support both urban tolerant and urban avoidant ‘raptors’ (Headland *et al.* 2023) which were common and abundant; comprising 9 kites/eagles/hawks/osprey (Accipitridae,), 4 falcons (Falconidae), 2 owls and Southern Boobook. Such agricultural landscapes tend to favour large-bodied granivorous or carnivorous birds, at the expense of arboreal foragers and nectarivores (F. Bennett & A. Ford 1997).

Waterbirds were moderately represented in the fauna assemblage given the presence of wetland habitats (25% of all birds recorded), including 9 ducks (Anatidae), 4 cormorants (Phalacrocoracidae), 4 ibis/spoonbill (Threskiornithidae), 3 herons/egrets (Ardeidae) and 3 shorebirds (Charadriidae, Scolopacidae).

Of the native mammals recorded, most were bats (8 species; Appendix 7), with 3 marsupials also recorded.

Table 5-4 Comparison of species recorded versus desktop list

Class	Desktop records	Current (Basic and Targeted fauna) survey records	Additional species recorded in study area in BBRAS	Total recorded assemblage (current survey & BBRAS)	Recorded in field but not in desktop list
Amphibians	12 (all native)	9 (all native)		9 (all native)	2 (all native)
Reptiles	25 (all native)	6 (all native)		6 (all native)	1 (native)
Birds	199 (198 native, 1 introduced)	89 (88 native, 1 introduced)	16 (all native)	105 (104 native, 1 introduced)	6 (all native)
Mammals	28 (23 native, 5 introduced)	16 (10 native, 6 introduced)	1 (native)	17 (11 native, 6 introduced)	6 (3 native, 3 introduced)
Total	**264**	**120**	**17**	**137**	**15**

5.2.3 Significant fauna records

Eight significant vertebrate species were recorded in the current survey, with a further 2 recorded in the BBRAS (Phoenix 2025a) that were not recorded in the current survey. They comprised 4 Threatened, 3 Priority, 2 Migratory and one OS species (Table 5-5; Figure 5-4):

Threatened

- Western Ringtail Possum (*Pseudocheirus occidentalis*; CR)
- Baudin's Cockatoo (*Zanda baudinii*; EN)
- Carnaby's Cockatoo (*Zanda latirostris*; EN)
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*; VU).

Priority species

- Masked Owl (southwest) (*Tyto novaehollandiae novaehollandiae*; P3)
- Quenda (*Isoodon fusciventer*; P4)
- Western False Pipistrelle (*Falsistrellus mackenziei*; P4).

Migratory and other specially protected species

- Wood Sandpiper (*Tringa glareola*; Mig.)
- Osprey (*Pandion haliaetus*; Mig.)
- Peregrine Falcon (*Falco peregrinus*; OS).

Black cockatoos were recorded in all survey phases. The most frequently and abundantly recorded black cockatoo species by visual observation was Forest Red-tailed Black Cockatoo, which was observed in all seasons (Appendix 8). The audio recordings in summer 2024-25 however, yielded a higher number of white-tailed black cockatoo detections than Forest Red-tails (Appendix 8). Carnaby's Cockatoo was recorded by visual observation in higher frequency and abundance than Baudin's Cockatoo, so it is reasonable to assume that a higher proportion of the audio recordings were also attributable to the former.

The largest black cockatoo counts were of Forest Red-tails (flock of 53) in autumn 2023, Baudin's (flock of 26) in winter 2023 and Forest Red-tails (flock of 17) in winter 2023. Most visual observations of black cockatoos however were of singles, pairs and small groups (<10; Appendix 8).

Table 5-5 Sites and habitat from which significant vertebrate fauna were recorded during the field survey

Species	Status	Records and comments	No. records	Habitats (recorded = R, suitable = S)[3, 4]									
				SIPW wetland[2]	SISE wetland[2]	SISH wetland[2]	MJP woodland[2]	OWP deg.[2]	Cleared	Cleared - DS[2]	Dam	Bluegum plant.	Pine plant.
Birds (7)													
Calyptorhynchus banksii naso Forest Red-tailed Black Cockatoo	VU (EPBC & BC Acts)	Audio recording, direct sighting, foraging, foraging evidence in the study area at sites AQU-01, AQU-02, AQU-03, AQU-25, AQU-40, AQU-55, BC2024_01, BCForaging, BCRoosting05, BCRoosting09, FRTBC-01, FRTBC-02, FRTBC-05, FRTBC-06, Opp12, Opp13, Opp15, Opp19, SM4-01, SM4-02, SM4-06, SM4-07, VER-22, VER-32, VER-33, VER-45, VER-47, VER-Opp04, VER-Opp07, VER-Opp08. Records throughout the WFA and from 2 RIAs. Most records of individuals and pairs, with only 9 records of >2 birds. The largest flock (53 individuals) recorded 1.5 km west of study area during the BBRAS (site BUS013[1]). It was directly observed foraging at one site (VER-Opp04) while foraging evidence (chewed Marri nuts predominantly) was obtained from 7 sites. Recorded 23 times on audio recordings, but only once from the BBRAS recorders (open paddocks). The Phase 3 audio recordings identified 12 detections, of which 6 were flyovers and 6 were foraging detections where the birds spent >1 minute at that site presumably foraging, or prospecting. All other records were of the birds moving through/over this habitat. No breeding or night roosting behaviour was observed. Suitable habitat within and surrounding the study area. Species is endemic to SW WA but the study area represents <0.1% of species estimated extent of occurrence (EOO) of 61,000 km² (DCCEEW 2024f) and is not at limit of species distribution.	45	R, S	R, S	R, S	R, S	S	R		R		
Falco peregrinus Peregrine Falcon	OS (BC Act)	Direct sighting of one individual at BUS011[1] in the WFA. Observed hunting near Governor Broome Rd in the southern part of the WFA. Much of the study area is suitable hunting habitat. May be a resident close to the study area, using the available habitats for hunting. Unlikely to nest in study area.	1	S	S	S	S	S	R, S	S	S	S	S

Species	Status	Records and comments	No. records	Habitats (recorded = R, suitable = S)[3, 4]									
				SIPW wetland[2]	SISE wetland[2]	SISH wetland [2]	MJP woodland[2]	OWP deg.[2]	Cleared	Cleared - DS[2]	Dam	Bluegum plant.	Pine plant.
Pandion haliaetus Osprey	Mig. (EPBC & BC Acts)	Direct sighting at 'Osprey' in the WFA as an opportunistic record during heritage survey, flying over a paddock WFA. Known to utilise a variety of near-coastal habitats. Suitable foraging habitat is abundant outside the study area. Unlikely to nest within the study area. Study area extent is insignificant relative to the distribution of this species which occurs around the entire Australian coastline. Study area is not at limit of species distribution.	1	S	S	S			R				
Tringa glareola Wood Sandpiper	Mig. (EPBC & BC Acts)	Direct sighting of 3 individuals at VER-36 in a SIPW wetland in the WFA. Likely to utilise wetland habitats in study area. Suitable habitat within and outside study area. Study area extent is insignificant relative to the distribution of this species which occurs at many coastal sites around Australia. Study area is not at limit of species distribution.	3	R, S	S	S							
Tyto novaehollandiae novaehollandiae Masked Owl (southwest)	P3 (DBCA List)	Audio recording at sites BUS014[1] in the central RIA and Mowl01 approximately 1 km south of the WFA. Recorded in May and November 2023 in the BBRAS. May be resident within woodland habitats generally of the study area, but more likely to roost and nest in such habitat along the Scott River and in nature reserve to the north where habitat is extensive. Study area extent is insignificant relative to the distribution of this species which occurs in SW corner of WA between Yanchep and Albany (ALA 2025). Study area is not at limit of species distribution.	2				R, S	S	R			S	

Species	Status	Records and comments	No. records	Habitats (recorded = R, suitable = S)[3, 4]									
				SIPW wetland[2]	SISE wetland[2]	SISH wetland [2]	MJP woodland[2]	OWP deg.[2]	Cleared	Cleared - DS[2]	Dam	Bluegum plant.	Pine plant.
Zanda baudinii Baudin's Cockatoo	EN (EPBC & BC Acts)	Records from the WFA, central RIA and outside the study area (south of WFA, including along the Scott River). Calls, direct sightings in the study area at BUS014[1], BUS019[1], Opp11 and VER-Opp01. Direct sightings outside study area at BUS015[1] and VER-41. The largest flock recorded was of 26 individuals and flocks of 8, 9 and 10 individuals also observed. One individual was observed on 3 occasions. Observed foraging just once, in MJP woodland along Governor Broome Rd (site VER-Opp01) in the WFA. All other observations were of birds moving through the landscape. No breeding or night roosting behaviour was observed. In addition to the records of Baudin's, *Zanda* sp. (either Baudin's or Carnaby's) was detected during Phase 3 audio recordings at all sites (92 individual detections/visitations) for a total occupation time of 9.5 hours over ~2 months of recording. Of the 82 detections via Phase 3 audio recorders, 37 (45%) were of birds flying over the site. *Zanda* sp. was also recorded directly 5 times, twice foraging and 3 times moving through the landscape. It is likely that the majority of these records were Carnaby's Cockatoo given the much higher rate of detection of this species over Baudin's (~4:1) during the surveys. Based on the records, the species appears to make limited use of vegetation/habitats within the WFA. Suitable habitat within and surrounding the study area. Species is endemic to SW WA but the study area represents <0.1% of species estimated EOO of 70,000 km² (DCCEEW 2024h) and is not at limit of species distribution.	7	S	S	S	R, S	S	R	S		S	

Species	Status	Records and comments	No. records	Habitats (recorded = R, suitable = S)[3, 4]									
				SIPW wetland[2]	SISE wetland[2]	SISH wetland [2]	MJP woodland[2]	OWP deg.[2]	Cleared	Cleared - DS[2]	Dam	Bluegum plant.	Pine plant.
Zanda latirostris Carnaby's Cockatoo	EN (EPBC & BC Acts)	Records throughout the WFA, as well as central RIA and outside the study area along the Scott River. Evidence of occupation via calls and direct sightings at 23 sites (36 total records), with repeated detections at a number of those sites. Predominantly recorded as singletons, with only 9 records of more than one individual and flocks >10 birds observed on 3 occasions, in the WFA and RIA. Observed foraging in MJP woodland just once, in the central RIA (site BUS014[1]). Only 2 other observations of foraging occurred, which was on the ground eating paddock seeds. All other records were of birds moving through the landscape. In addition to the records of Baudin's, *Zanda* sp. (either Baudin's or Carnaby's) was detected during Phase 3 audio recordings at all sites (92 individual detections/visitations) for a total occupation time of 9.5 hours over ~2 months of recording. Of the 82 detections via Phase 3 audio recorders, 37 (45%) were of birds flying over the site. *Zanda* sp. was also recorded directly 5 times, twice foraging and 3 times moving through the landscape. It is likely that the majority of these records were Carnaby's Cockatoo given the much higher rate of detection of this species over Baudin's (~4:1) during the surveys. No breeding or night roosting behaviour was observed. Suitable habitat within and surrounding the study area. Species is endemic to SW WA but the study area represents <0.1% of species estimated EOO of 180,000 km² (DCCEEW 2024i) and is not at limit of species distribution.	36	R, S	R, S	R, S	R, S					S	S
Mammals (3)													

Species	Status	Records and comments	No. records	Habitats (recorded = R, suitable = S)[3, 4]									
				SIPW wetland[2]	SISE wetland[2]	SISH wetland [2]	MJP woodland[2]	OWP deg.[2]	Cleared	Cleared - DS[2]	Dam	Bluegum plant.	Pine plant.
Falsistrellus mackenziei Western False Pipistrelle	P4 (DBCA List)	Records from WFA, RIA and outside study area west and south of WFA. Calls in the study area at BUS001[1], BUS004[1], BUS011[1], , BUS014[1] and VER-43, and outside the study area at BUS013[1] and BUS015[1]. Recorded regularly, over several site visits. Recorded from MJP woodland in the central RIA, and from SISE wetland, SISH wetland and cleared areas in the WFA. Records in study area are considered foraging or dispersal activity. Limited 'roosting' habitat within the study area, species prefers dense 'old-growth'/mature wet sclerophyll forests of Karri, Jarrah and Tuart eucalypts. Suitable roosting habitat plentiful outside the study area. Species is endemic to SW WA but the study area represents ~0.1% of species estimated EOO of 33,750 km² (Armstrong *et al.* 2017) and is not at limit of species distribution.	10		R	R	R, S	S	R				
Isoodon fusciventer Quenda	P4 (DBCA List)	Direct sighting and foraging evidence in the study area at Quenda01, Quenda02 and VER-Opp05 in SISH wetland along Governor Broome Rd in the WFA and outside the study area south of Governor Broome Road. Suitable habitat within and surrounding the study area. Species is endemic to SW WA but the study area represents <0.1% of species distribution and is not at the limit of this.	3	S	S	R, S	S						

Species	Status	Records and comments	No. records	Habitats (recorded = R, suitable = S)[3, 4]									
				SIPW wetland[2]	SISE wetland[2]	SISH wetland [2]	MJP woodland[2]	OWP deg.[2]	Cleared	Cleared - DS[2]	Dam	Bluegum plant.	Pine plant.
Pseudocheirus occidentalis Western Ringtail Possum	CR (EPBC & BC Acts)	Sixteen individuals recorded by direct sighting in the study area at VER-21 (female with juvenile), VER-31 (3 individuals), WRP01 (3 individuals), WRPTrans03 (female with juvenile), WRPTrans04 (female with juvenile and 2 solo individuals), WRPTrans08 (female with juvenile). In addition, one drey with possible individual recorded (site Drey01). All records were in MJP woodland remnants at the northern and southern margins of the WFA and in the central RIA. Suitable habitat within and surrounding study area. Species is endemic to SW WA. Study area represents <0.1% of species estimated EOO of 40,000 km² (DSEWPaC 2013). Extent of high-value habitat in study area is 97.6 ha. Estimated area of occupancy in DSEWPaC (2013) is inferred as <50,000 ha, possibly <10,000 ha. Study area is not at limit of species distribution.	9				R, S						

1 - Sites from BBRAS (see Appendix 3). 2-SIPW wetland – Seasonally inundated paperbark woodland (wetland); SISE wetland – Seasonally inundated sedgeland (wetland); SI shrubland – Seasonally inundated shrubland; MJP woodland – Marri-Jarrah-Peppermint woodland; OWP deg. – Open woodland of Peppermint trees (degraded); DS – degraded sumpland. 3 - Recorded (R) includes observations of birds flying over/transiting through a habitat. Habitats designated suitable (S) are those that may be suitable for foraging (received a moderate or high foraging habitat quality rating), roosting and/or breeding by the species. 4 - Refer to Table 5-2 for habitat preferences for each species.

5.2.4 Significant fauna habitat assessments

5.2.4.1 Black cockatoo habitat

5.2.4.1.1 Potential nesting trees

A total of 760 PNTs represented by at least 5 species were recorded in the study area (Table 5-6; Figure 5-5; Appendix 9). Jarrah was the most commonly recorded PNT species, with 405 (53.3%) trees ranging in size from 500–1,400 mm (DBH) and had a mean DBH of 673.7 mm (SD ± 158.4 mm).

Marri were the 2nd most common PNT recorded (246 trees; 32.4%), with DBH ranging from 500 mm–1,900 mm (SD ± 192.2 mm) and a mean DBH of 692.3 mm (Table 5-6).

The 3rd most common 'group' could not be identified to species level because they were dead (88) but were generally assumed to be Jarrah or Marri. These trees ranged in size from 500–1,400 mm, and on average had the greatest DBH with a mean of 697.0 mm (SD ± 179.9 mm).

A handful of Flooded Gum (6 trees; 0.7%) and Swan River Blackbutt (14 trees; 1.7%) were recorded in wetter areas and drainage lines, and a single paddock-planted old Bluegum was also recorded.

The majority of PNTs in the study area (672; 88.4%) were recorded in Marri-Jarrah-Peppermint woodland. The remainder were recorded in Seasonally inundated shrubland (111; 14.6%), Seasonally inundated paperbark woodland (14; 1.8%), Bluegum plantation (8; 1.0%), Cleared (7) and Open woodland of Peppermint trees (degraded) (2).

Based on current guidance (DAWE 2022), 3 of the 4 tree species may support breeding by Baudin's Cockatoo and 2 of the tree species may support breeding by Forest Red-tailed Black Cockatoo. Carnaby's Cockatoo is known to nest in Jarrah, Marri and Flooded Gum, as well as other eucalypt species with suitable hollows; however, as noted in section 5.1.2 the study area is outside the current breeding range for the species.

Table 5-6 PNTs recorded in the study area

Species	Black cockatoo usage[1]			Total count	DBH (mm) – all trees					
	Carnaby's	Baudin's	FRTBC		Min.	Max.	Range	Median	Mean	Std. dev.
Eucalyptus marginata (Jarrah)	F, N, R	F, N, R	F, N, R	405	500	1,400	900	630	673.7	158.4
Corymbia calophylla (Marri)	F, N, R	F, N	F, N	246	500	1,900	1,400	640	692.3	192.2
Unidentified tree[2]	N, R	N, R	N, R	88	500	1,400	900	650	697.0	179.9
Eucalyptus patens (Swan River Blackbutt)	F, N, R	R	F, N, R	14	520	990	470	610	657.1	124.7
Eucalyptus globulus (Bluegum)	F, N, R	F, N, R		6	500	1,150	650	525	716.7	289.6
Eucalyptus rudis (Flooded Gum)	F, N, R			1	680	680	0	680	680.0	0.0
Total/Mean				**760**	**533.3**	**1,253.3**	**720**	**622.5**	**686.1**	**157.5**

1 - F - foraging, R - roosting, N - nesting. 2 - *Eucalyptus* sp. or *Corymbia calophylla*, typically unable to be assigned to species level because they were dead.

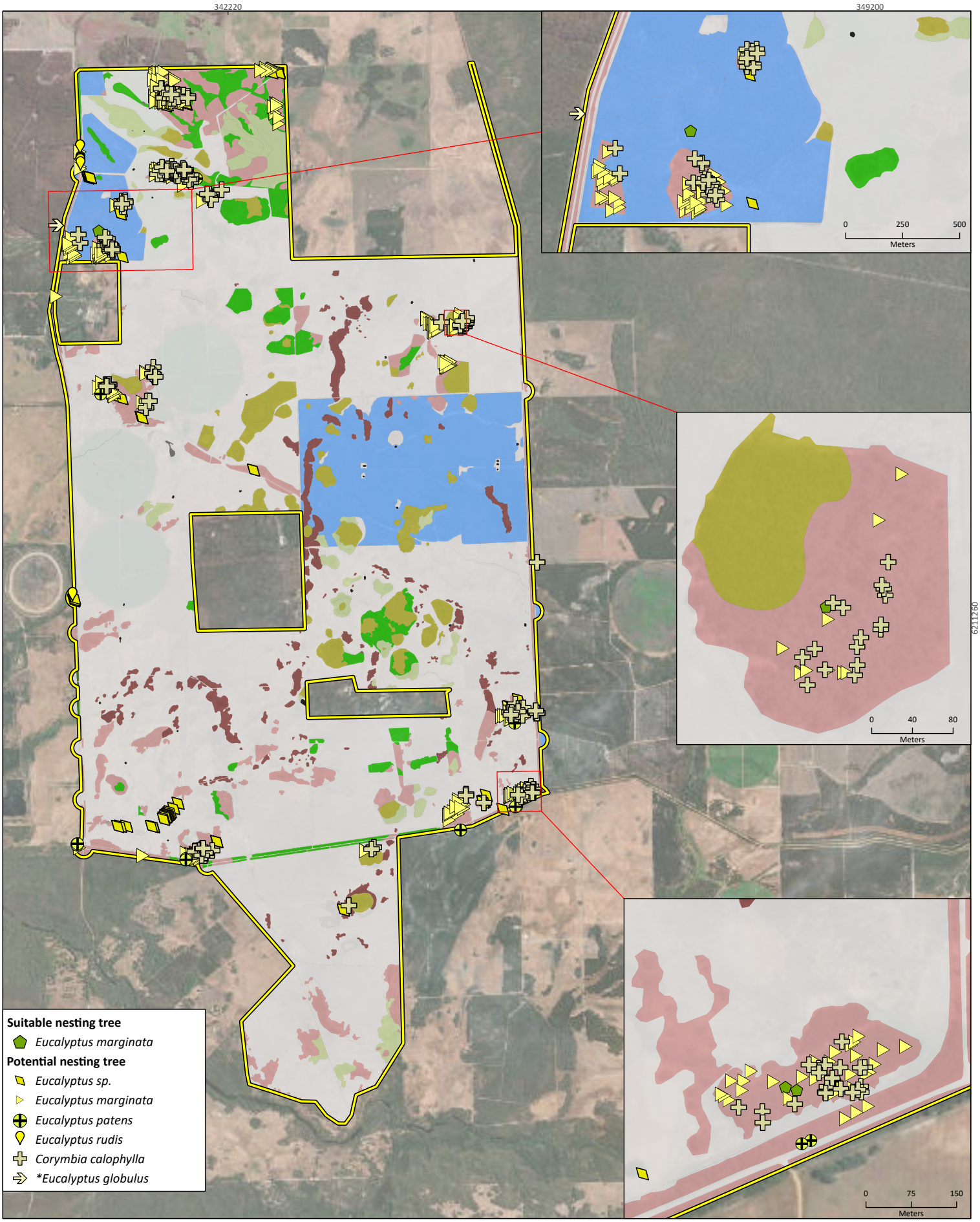
Table 5-7 summarises the PNTs recorded in the study area with respect to trees with hollows and trees in each of the 3 PNT categories (see definitions in section 4.2.2.5.1). Jarrah recorded the greatest number of trees with hollows (102) with a total 128 hollows identified. Marri recorded >71% fewer hollows than Jarrah, with a total of only 35 hollows recorded from 30 individual trees. Twenty-three hollows were recorded from dead trees that could not be identified. And finally, Swan River Blackbutt also recorded 3 hollows from 2 trees.

Using the criteria presented in section 4.2.2.5.1 the study area was found to contain no known nesting trees and just 4 suitable nesting trees, all from Jarrah. Potential nesting trees are any tree with a DBH >500mm that do not currently contain a suitable nesting hollow, a total of 756 such trees were recorded; 53.0% of these trees were Jarrah, 32.5% were Marri and 11.6% were dead trees. Overall, therefore, it is noted that Jarrah trees with hollows were recorded at over 3 times the rate of Marri, i.e. while Marri are generally considered far better at producing hollows this is not the case within the study area.

Table 5-7 Number of hollows recorded for each tree species per PNT category

PNT Species	No. trees with hollows	Total no. of hollows	Known nesting tree	Suitable nesting tree	Potential nesting tree
Eucalyptus marginata (Jarrah)	102	128		4	401
Corymbia calophylla (Marri)	30	35			246
Unidentified tree[1]	21	23			88
Eucalyptus patens (Swan River Blackbutt)	2	3			14
Eucalyptus rudis (Flooded Gum)	0	0			6
Eucalyptus globulus (Bluegum)	0	0			1
Total	**155**	**189**	**0**	**4**	**756**

1 – typically unable to be assigned to species level because they were dead.



SynergyRED
Proposed wind farm in Scott River

Project No	1583
Date	18/08/2025
Drawn by	BK
Map author	JC

0 1 2
Kilometers

1:53,150 (at A4) GDA 1994 MGA Zone 50

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Study area

Habitat

- Bluegum plantation
- Cleared
- Cleared - degraded sumpland
- Dam
- Marri-Jarrah-Peppermint woodland
- Open woodland of Peppermint trees (degraded)
- Pine plantation
- Seasonally inundated paperbark woodland (wetland)
- Seasonally inundated sedgeland (wetland)
- Seasonally inundated shrubland (wetland)

Figure 5-5a

Black cockatoo potential nesting trees

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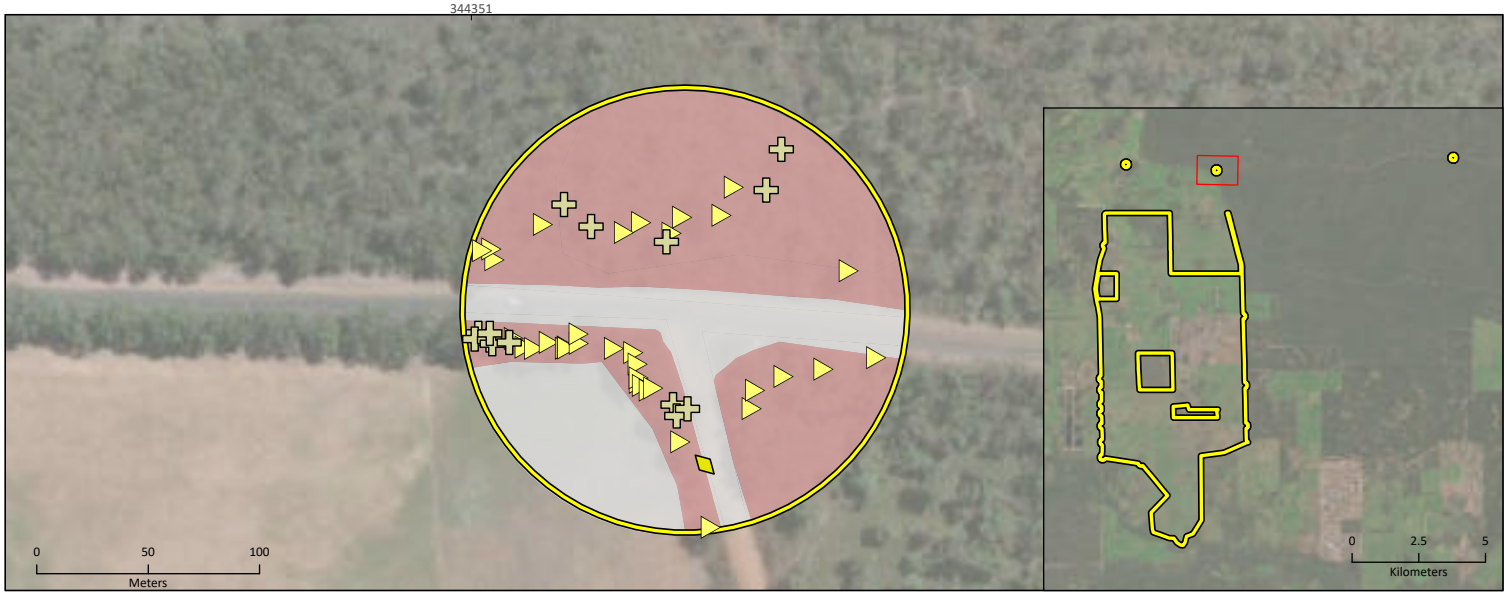

SynergyRED
Proposed wind farm in Scott River

Project No	1583
Date	18/08/2025
Drawn by	BK
Map author	JC

1:3,374 (at A4) GDA 1994 MGA Zone 50

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Study area

Habitat

- Cleared
- Marri-Jarrah-Peppermint woodland
- Seasonally inundated shrubland (wetland)

Potential nesting tree

- Eucalyptus sp.
- Eucalyptus marginata
- Corymbia calophylla

Figure 5-5b

Black cockatoo potential nesting trees

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5.2.4.1.2 Night roosting

No evidence of night roosting by black cockatoos was detected during the surveys, with no individuals or flocks seen arriving in the study area near dusk over an extended survey period during night roosting surveillance, no audio data recording evening arrivals or other activity and no aggregations of feathers or feeding debris observed under trees. While no evidence of roosting was observed, the study area contains numerous remnants with known roosting tree species as listed in Table 5-6 and including the *Pinus* sp. (Carnaby's Cockatoo only) found within Pine plantation habitat (Figure 5-4).

Habitats that provide suitable trees for night roosting in the study area are the same as those that contain PNT, principally Marri-Jarrah-Peppermint woodland, as well as Seasonally inundated shrubland wetland and Seasonally inundated paperbark woodland (wetland). The tightly planted row of *Pinus* sp. on Scott River Road may also support roosting.

There is no way to quantitatively assess roosting habitat quality, suffice it to say that the study area and general surrounds contain numerous largely ephemeral natural and artificial water sources (e.g. dams and soaks), a range of different food sources (e.g. eucalypt forests and woodlands, *Banksia* woodlands and coastal heaths), and extensive forest and woodland habitats possibly suitable for breeding, although no breeding is known within 14 km of the study area. As such the Marri-Jarrah-Peppermint woodland habitat of the study area in particular cannot be discounted as roosting habitat, even though none has been observed to date (directly or indirectly) and the trees were found to be smaller in height compared with typical Jarrah and Marri heights in the Southern Jarrah Forest (JAF02), noting that DAWE (2022) identifies 'tall' trees as a prerequisite for roosting of Carnaby's Cockatoo and FRTBC, which were the 2 most commonly recorded species of the 3 black cockatoos.

5.2.4.1.3 Foraging habitat

A total of 23 species of plant that are known to be food sources for the 3 black cockatoo species were recorded in the study area by Phoenix (2025b), including 21 for Carnaby's Cockatoo, 11 for Baudin's and 5 for Forest Red-tailed Black Cockatoo (Table 5-8). The list of plants includes 3 introduced species, **Pinus* sp., **Arctotheca calendula* (Cape Weed) and **Romulea rosea* var. *australis* (Guildford Grass).

When the food sources are considered in terms of their relative distribution and cover values, the following species are considered the most important foraging plants for black cockatoos in the study area (highlighted in grey in Table 5-8):

- *Agonis flexuosa* var. *flexuosa* Peppermint – food source for Carnaby's Cockatoo
- *Allocasuarina fraseriana* Sheoak – food source for all 3 black cockatoo species
- *Banksia attenuata* Slender Banksia – food source for Carnaby's Cockatoo
- *Corymbia calophylla* Marri – food source for all 3 black cockatoo species
- *Eucalyptus marginata* Jarrah – food source for all 3 black cockatoo species
- *Xanthorrhoea preissii* Grass tree – food source for Carnaby's and Baudin's Cockatoos.

While distinguishing species' foraging evidence on Marri nuts can be done fairly readily, it is generally not possible for the other species of plants recorded and accordingly chewed Marri nuts was the only foraging evidence directly recorded, for all 3 species of cockatoo. Carnaby's Cockatoo were however directly observed twice foraging on the ground, on paddock grasses. It is not known whether the plant was Guildford Grass or Cape Weed, or another paddock grass/weed.

In addition, the extended audio recorder deployment in Phase 3 recorded 572 minutes of 'white-tailed black cockatoo' foraging and 42 minutes of Forest Red-tailed Black Cockatoo foraging (assumed due to the length of time birds were active; Appendix 8) over the ~2 month period the recorders were deployed.

Table 5-8 Black cockatoo food sources, sites, habitats, and their recorded minimum and maximum cover values

Family	Species[1]	Vernacular	Habitats present	No. sites[2]	Min. cover (%)[2]	Max. cover (%)[2]	Carnaby's	Baudin's	FRTBC
Asteraceae	**Arctotheca calendula*	Cape Weed	Cleared, Marri-Jarrah-Peppermint woodland, Seasonally inundated shrubland (wetland)	6	0.1	3	✓		
Casuarinaceae	*Allocasuarina fraseriana*	Sheoak	Marri-Jarrah-Peppermint woodland, Seasonally inundated shrubland (wetland)	9	2	25	✓	✓	✓
Dasypogonaceae	*Kingia australis*	Kingia	Marri-Jarrah-Peppermint woodland	2	8	15		✓	
Fabaceae	*Jacksonia furcellata*	Grey Stinkwood	Marri-Jarrah-Peppermint woodland	1	0.2	0.2	✓		
Haemodoraceae	*Anigozanthos flavidus*	Tall Kangaroo Paw	Cleared, Marri-Jarrah-Peppermint woodland, Seasonally inundated paperbark woodland (wetland), Seasonally inundated shrubland (wetland)	11	0.1	3		✓	
Iridaceae	**Romulea rosea* var. *australis*	Guildford Grass	Seasonally inundated shrubland (wetland)	4	0.1	0.1	✓		
Myrtaceae	*Agonis flexuosa* var. *flexuosa*	Peppermint	Cleared, Marri-Jarrah-Peppermint woodland, Open woodland of Peppermint trees (degraded), Seasonally inundated shrubland (wetland)	34	0	60	✓		
Myrtaceae	*Corymbia calophylla*	Marri	Marri-Jarrah-Peppermint woodland, Seasonally inundated shrubland (wetland)	14	4	65	✓	✓	✓
Myrtaceae	*Eucalyptus marginata* subsp. *marginata*	Jarrah	Cleared, Marri-Jarrah-Peppermint woodland, Seasonally inundated shrubland (wetland)	34	0.2	65	✓	✓	✓
Pinaceae	**Pinus* sp.	Pine tree	Pine plantation - a long single-row of densely planted Pine trees on Scott River Road that numbered 187 in total	1			✓		

Family	Species[1]	Vernacular	Habitats present	No. sites[2]	Min. cover (%)[2]	Max. cover (%)[2]	Carnaby's	Baudin's	FRTBC
Proteaceae	*Banksia attenuata*	Slender Banksia	Marri-Jarrah-Peppermint woodland	8	1	15	✓		
Proteaceae	*Banksia grandis*	Bull Banksia	Seasonally inundated shrubland (wetland)	1	1	1	✓	✓	
Proteaceae	*Banksia ilicifolia*	Holly-leaved Banksia	Marri-Jarrah-Peppermint woodland	6	0.2	7	✓		
Proteaceae	*Banksia littoralis*	Swamp Banksia	Marri-Jarrah-Peppermint woodland, Seasonally inundated shrubland (wetland)	3	0.2	2	✓		
Proteaceae	*Banksia nivea* subsp. *nivea*		Marri-Jarrah-Peppermint woodland, Seasonally inundated shrubland (wetland)	4	0.1	15	✓		
Proteaceae	*Hakea falcata*		Marri-Jarrah-Peppermint woodland	1	0.1	0.1	✓		
Proteaceae	*Hakea lasianthoides*		Marri-Jarrah-Peppermint woodland, Seasonally inundated shrubland (wetland)	4	1	15	✓	✓	
Proteaceae	*Hakea lissocarpha*	Honey Bush	Marri-Jarrah-Peppermint woodland	3	0.1	2	✓	✓	
Proteaceae	*Hakea ruscifolia*	Candle Hakea	Cleared, Marri-Jarrah-Peppermint woodland	3	0.1	0.3	✓	✓	✓
Proteaceae	*Hakea sulcata*	Furrowed Hakea	Cleared, Marri-Jarrah-Peppermint woodland, Seasonally inundated shrubland (wetland)	8	0.1	3	✓		
Proteaceae	*Hakea varia*	Variable-leaved Hakea	Cleared, Marri-Jarrah-Peppermint woodland, Seasonally inundated shrubland (wetland)	7	0.1	3	✓	✓	
Proteaceae	*Persoonia longifolia*	Snottygobble	Marri-Jarrah-Peppermint woodland	3	0	3	✓		✓
Xanthorrhoeaceae	*Xanthorrhoea preissii*	Grass tree	Cleared, Marri-Jarrah-Peppermint woodland, Seasonally inundated shrubland (wetland)	44	0.1	11	✓	✓	
						Total	**21**	**11**	**5**

1 - Shaded rows denote species that are the most important foraging plants for black cockatoos in the study area. [2]Data/sites from flora and vegetation survey for Project (Phoenix 2025b).

Foraging habitat quality was assessed using 2 methods, DAWE (2022) and Bamford (2021). The results against the DAWE (2022) assessment metrics are presented in Table 5-9 for each black cockatoo species. The scores per habitat type for each species are presented in Table 5-10. The final score in Table 5-10 for each species applies only to native remnant vegetation that supports foraging species (per Table 5-8), except for Pine plantation which is a food source for Carnaby's Cockatoo. Highly modified habitats, or habitat without foraging species were scored 0. The scores therefore primarily apply to Marri-Jarrah-Peppermint woodland and Seasonally inundated paperbark woodland (wetland). Foraging habitat quality per DAWE (2022) scored 9 for Baudin's Cockatoo and Forest Red-tailed Black Cockatoo, and 7 for Carnaby's Cockatoo, as the study area is outside its known breeding range.

Marri-Jarrah-Peppermint woodland is the most important habitat for all 3 black cockatoo species using DAWE (2022) as it contains the highest number of food sources and has the greatest extent in the study area (Table 5-10; Figure 5-6–Figure 5-8). Seasonally inundated shrubland (wetland) is also important as it too supports all 3 species and is widespread across the study area. In aggregate, 17.9% of the study area is considered black cockatoo foraging habitat under the DAWE method.

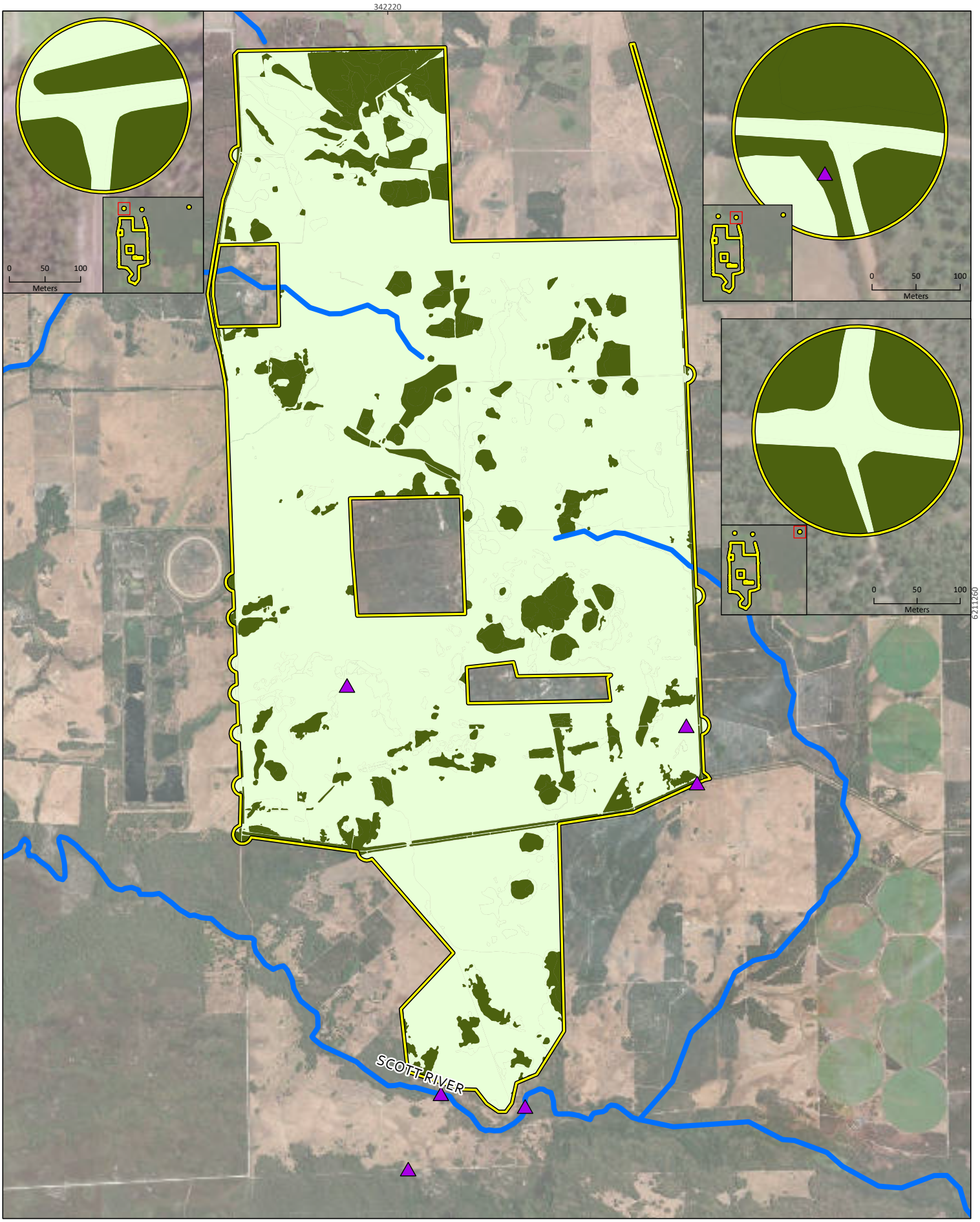
Table 5-9 Black cockatoo foraging habitat quality scores per DAWE (2022)

Attributes	Baudin's Cockatoo	Carnaby's Cockatoo	FRTBC	Justification
Starting score	10	10	10	Remnants include native eucalypt (Jarrah/Marri) woodland and shrubland containing proteaceous species (*Banksia* sp. *Hakea* sp. and *Grevillea* sp.). Study area is within the range of all 3 species.
Foraging attributes				
Foraging potential	0	0	0	There is evidence of foraging by all species.
Connectivity	0	0	0	There is ample foraging habitat within 12 km for all 3 species.
Proximity to breeding	0	-2	0	There is no direct evidence of breeding within 12 km for all 3 species, however there is breeding habitat present for Baudin's Cockatoo and FRTBC and so undetected breeding cannot be discounted. The study area is outside the breeding range for Carnaby's Cockatoo.
Proximity to roosting	0	0	0	There are known roosting sites within 20 km (DBCA 2023c) one 'white-tailed cockatoo' roost (therefore either Carnaby's or Baudin's) and one unknown taxa (therefore any one of the 3 species). Potentially other roost sites present.
Impact from significant plant disease	-1	-1	-1	While dieback was not obvious with many susceptible species present, there is a long history of habitat modification and intensive use in the area, and the floodplain nature means spores can be transported easily across the landscape. Therefore, it is assumed that dieback is present.
Final score	**9**	**7**	**9**	

Table 5-10 DAWE (2022) foraging habitat scores per habitat type

Fauna habitat	Area of habitat (ha)	Foraging habitat score			Area all foraging habitat (ha)[1]
		Baudin's Cockatoo	Carnaby's Cockatoo	FRTBC	
Marri-Jarrah-Peppermint woodland	322	9	7	9	322
Seasonally inundated paperbark woodland (wetland)	144.9	9	0	0	144.9
Seasonally inundated shrubland (wetland)	126.1	9	7	9	126.1
Open woodland of Peppermint trees (degraded)	98.9	0	7	0	98.9
Pine plantation	1.6	0	7	0	1.6
Dam	1.7	0	0	0	0
Cleared - degraded sumpland	8.1	0	0	0	0
Cleared	2666	0	0	0	0
Seasonally inundated sedgeland (wetland)	107	0	0	0	0
Bluegum plantation	415.4	0	0	0	0
Total area / total area foraging habitat	**3,891.7**	**593.0**	**548.6**	**448.1**	**693.5**
% of study area	**100.0%**	**15.2%**	**14.1%**	**11.5%**	**17.8%**

1 - For any black cockatoo species.



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Proposed wind farm in Scott River

Project No	1583
Date	30/06/2025
Drawn by	BK
Map author	JC

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- Study area
- Rivers
- Baudin's Cockatoo records

Habitat score

- 0
- 9

Figure 5-6

Baudin's Cockatoo foraging habitat quality (DAWE 2022 method)

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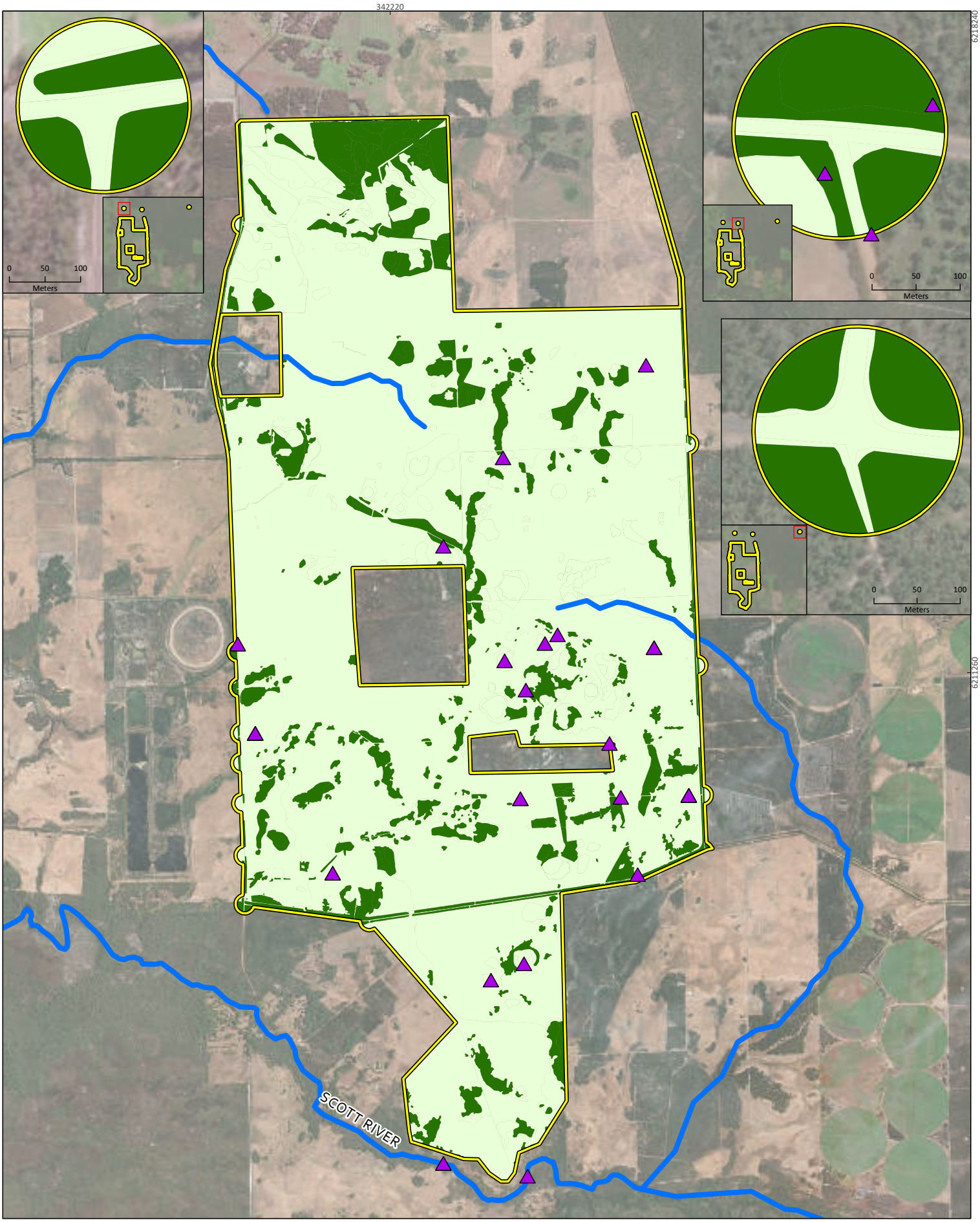

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- Study area
- Rivers
- Carnaby's Cockatoo records

Habitat score

- 0
- 7

Figure 5-7
Carnaby's Cockatoo foraging habitat quality (DAWE 2022 method)

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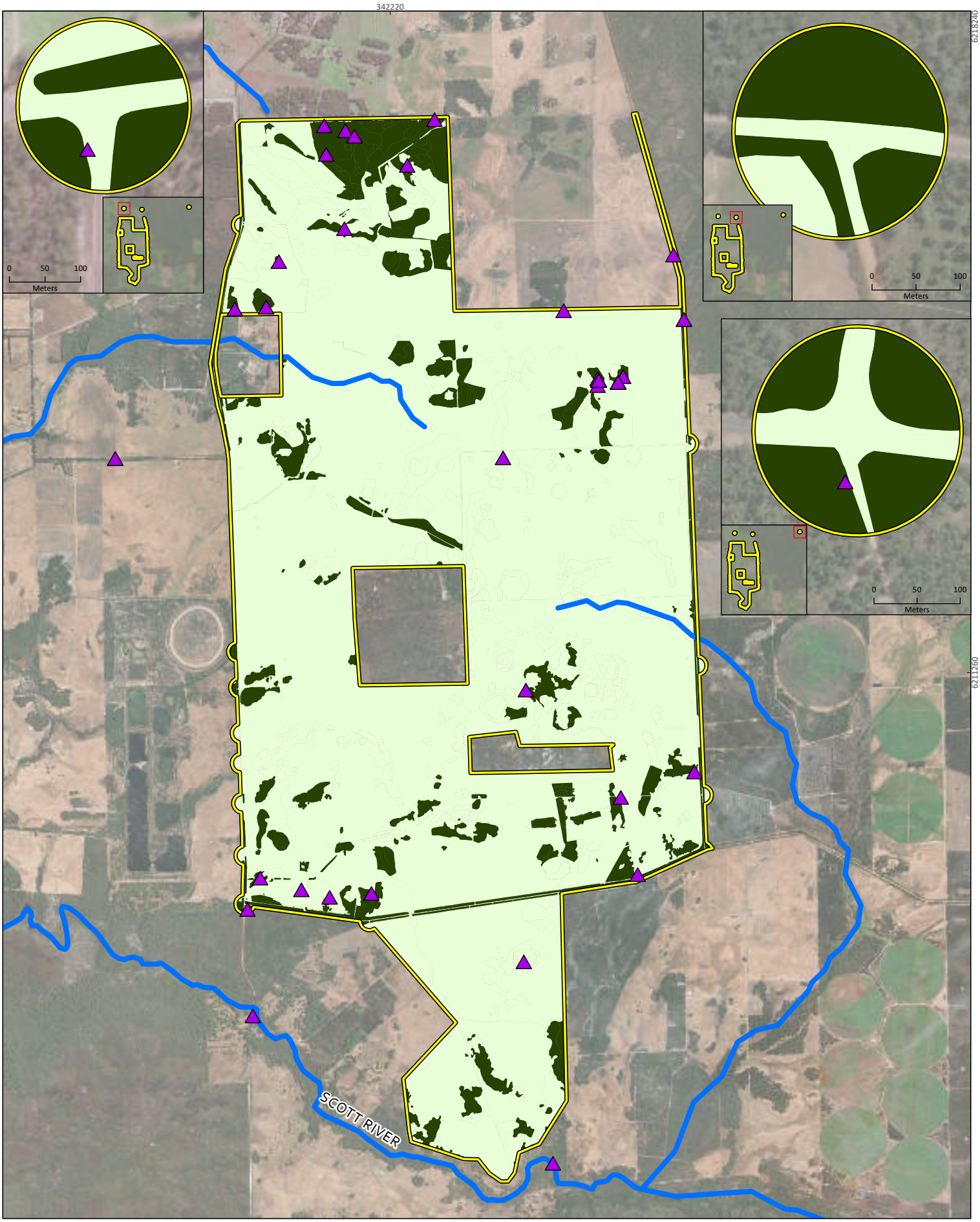

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- Study area
- Rivers
- Forest Red-tailed Black Cockatoo records

Habitat score

- 0
- 9

Figure 5-8

Forest Red-tailed Black Cockatoo foraging habitat quality (DAWE 2022 method)

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The area (ha) of foraging habitat in the study area for each black cockatoo species, per quality category (see section 4.2.2.5.3) based on the Bamford (2021) assessment metrics is shown graphically in Figure 5-9 (and spatially in Figure 5-10, Figure 5-11 and Figure 5-12). In Figure 5-9 it can be clearly seen that Carnaby's Cockatoo is the only species where almost the entirety of the study area is considering to have at least low foraging value, and this is because Carnaby's Cockatoo is known to feed on a variety of paddock grasses such as *Erodium* species, Cape Weed (*Arctotheca calendula*) (Table 5-8) and melons, and indeed it was observed doing just that on 2 occasions. For Baudin's Cockatoo and Forest Red-tailed Black Cockatoo the vast majority of the study area is considered not to be foraging habitat. The largest area of high-quality foraging habitat (318 ha) is for Forest Red-tailed Black Cockatoo.

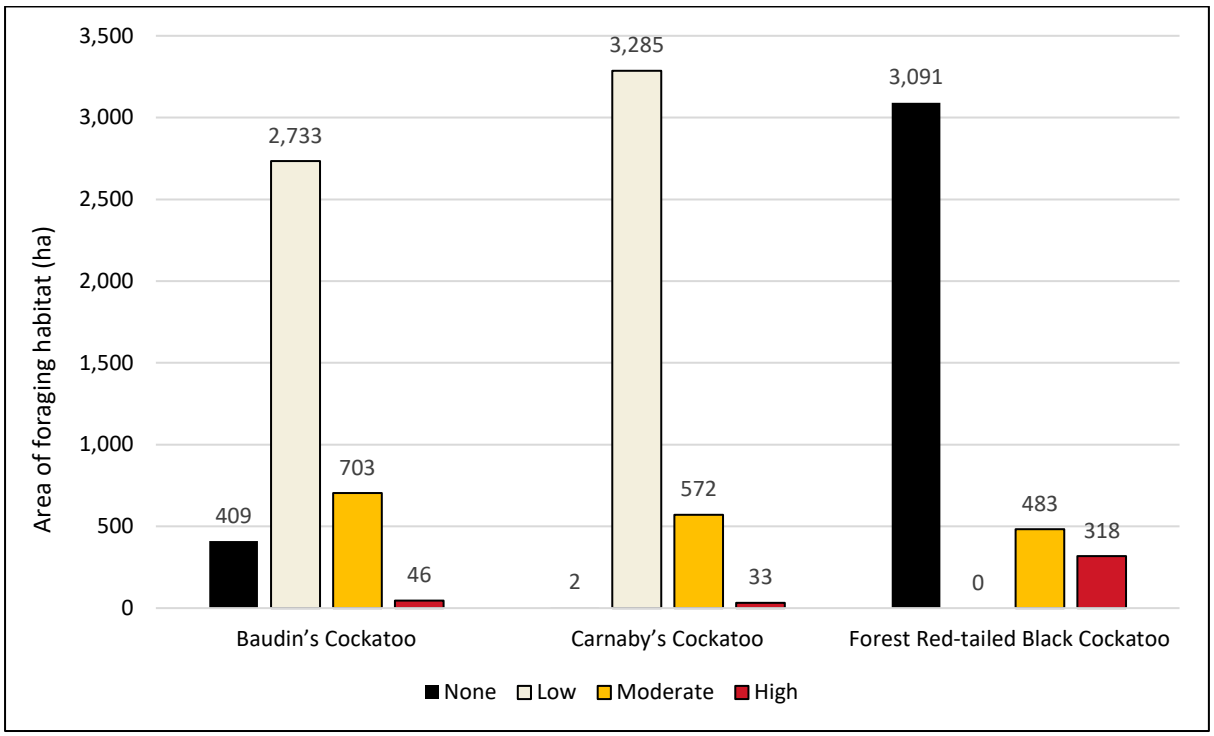


Figure 5-9 Area (ha) of foraging habitat (Bamford 2021) per quality category per species

The raw scores per habitat type are provided for each species separately in Table 5-11 – Table 5-13. High-quality and moderate-quality foraging habitat for black cockatoos occurred in the 3 RIAs, a large continuous area at the northern boundary of the WFA and in smaller remnants elsewhere in the study area (Figure 5-10 – Figure 5-12).

Baudin's Cockatoo

Approximately 3,191.6 ha (82.0%) was found to have no foraging value for Baudin's Cockatoo. High-quality foraging habitat totalled 46 ha (1.2% of the study area) and was restricted to Marri-Jarrah-Peppermint woodland. Moderate-quality habitat (score of 5–7) was found to occur in Marri-Jarrah-Peppermint woodland and Seasonally inundated shrubland (wetland) and comprised 392.1 ha (10.1%) in total (Table 5-11). The remainder of the study area was classified as low-quality or having no foraging value for Baudin's Cockatoo.

Considering the distribution of foraging habitat value, it can be seen in Figure 5-10 that a large aggregation of moderate and high-value habitat occurs on the northern boundary. Elsewhere high-value habitat occurs in clustered remnants in the northeast paddock, and moderate–high-value patches occur across the south, just north of Governor Broome Road, as well as south of Governor Broome Road, near the southern extent of the study area. Low-value foraging habitat is distributed in patches throughout the central portion of the study area.

Carnaby's Cockatoo

For Carnaby's Cockatoo, just ~33.0 ha (0.8% of the study area) was assessed as high-quality foraging habitat, all within Marri-Jarrah-Peppermint woodland habitat (Table 5-12). A further 571.5 ha (14.7%) was classified as moderate-quality foraging habitat, comprising the 3 wetland habitat types and Marri-Jarrah-Peppermint woodland. A total of 3,285.3 ha (84.4%) is considered low-quality foraging habitat, comprising of predominantly the cleared areas which seasonally support paddock grasses such as *Erodium* species and Cape Weed (*Arctotheca calendula*) on which the species is known to feed. Just 1.7 ha (dams) is not foraging habitat for the species.

In contrast to Baudin's Cockatoo and Forest Red-tailed Black Cockatoo, the majority of the study area has some foraging value to Carnaby's Cockatoo (Figure 5-11). However, similarly, the best remnants represent moderate–high-value habitat, such that, again, there is a large aggregation of moderate–high-value habitat on the northern boundary and high-value habitat clustered in remnants in the northeast paddock, moderate–high-value patches occur across the south, just north of Governor Broome Road and south of Governor Broome Road near the southern extent of the WFA. There is also 2 patches of high-value habitat within the north-western Bluegum plantation (Figure 5-11).

Forest Red-tailed Black Cockatoo

For Forest Red-tailed Black Cockatoo, 3,443.6 (88.5%) of the study area is not foraging habitat. A total of 170.5 ha (4.4% of the study area) was assessed as high-quality foraging habitat and 261.6 ha (6.7%) classified as moderate-quality habitat, almost entirely all within Marri-Jarrah-Peppermint woodland. Seasonally inundated shrubland (wetland) also represented foraging habitat, being 110.1 ha of moderate-quality and 15.9 ha being of low-quality. The vast majority therefore is not foraging habitat for the species (3,443.6 ha; 88.5%) (Table 5-13).

The distribution of foraging habitat value for Forest Red-tailed Black Cockatoo is shown in Figure 5-12. The value for this species is very similar to that of Baudin's Cockatoo. There is a large aggregation of moderate–high-value habitat on the northern boundary, and high-value habitat occurs in clustered remnants in the northeast paddock. Moderate–high-value patches occur across the south, just north of Governor Broome Road, as well as south of Governor Broome Road, near the southern extent of the study area. Much of the central remnants considered low-value for Baudin's however is not considered foraging habitat for Forest Red-tailed Black Cockatoo (Figure 5-12).

Table 5-11 Baudin's Cockatoo foraging habitat quality (Bamford 2021) – area (ha) per score and habitat type

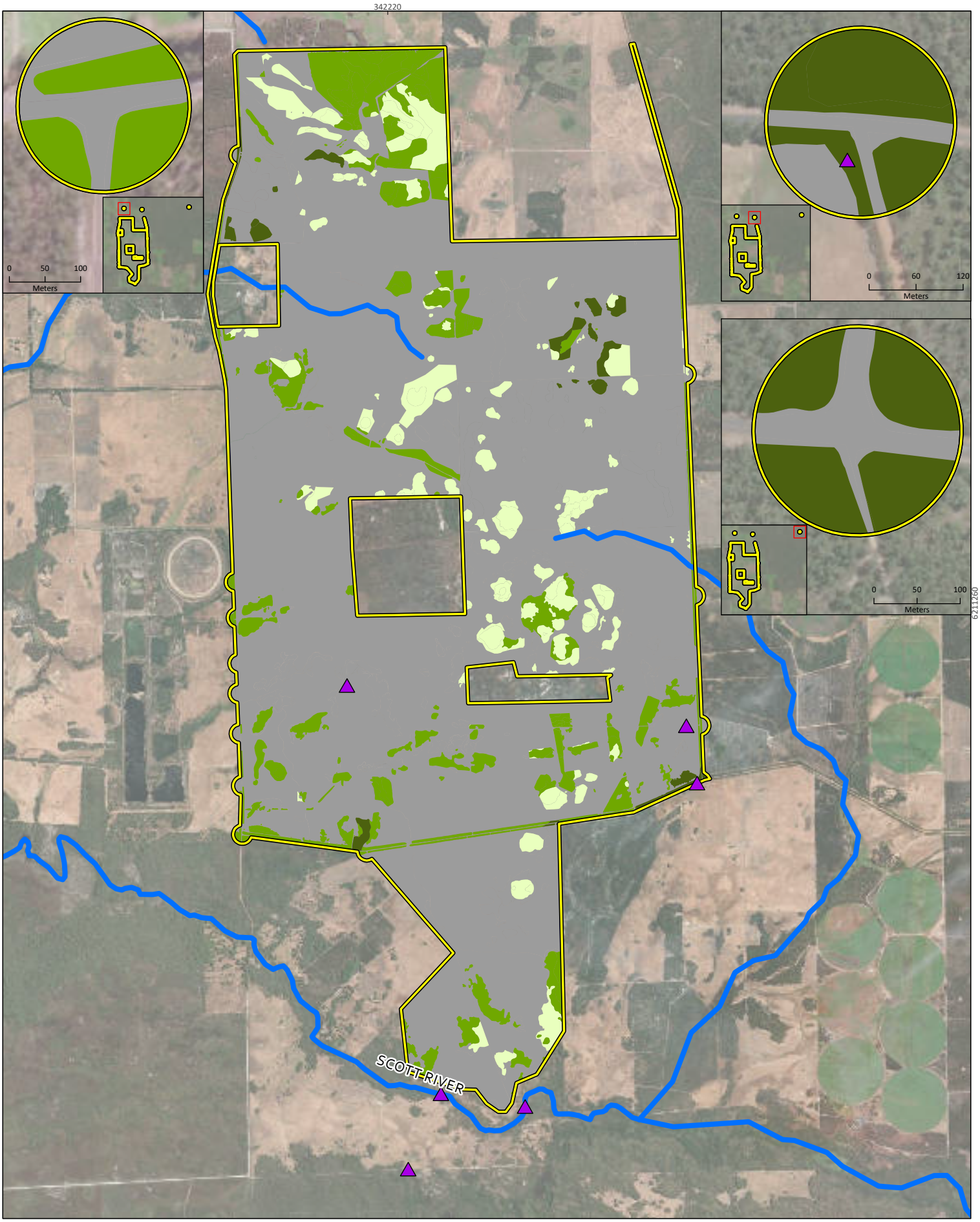
Habitat type	None	Low			Moderate			High	Total
	0	2	3	4	5	6	7	8	
Bluegum plantation	415.4								415.4
Cleared	2,666.0								2,666.0
Cleared - degraded sumpland	8.1								8.1
Dam	1.7								1.7
Marri-Jarrah-Peppermint woodland				4.1	22.9	61.6	187.4	46.1	322.0
Open woodland of Peppermint trees (degraded)	98.9								98.9
Pine plantation	1.6								1.6
Seasonally inundated paperbark woodland (wetland)			144.9						144.9
Seasonally inundated sedgeland (wetland)		107.0							107.0
Seasonally inundated shrubland (wetland)			5.8		120.3				126.1
Total per score	**3,191.6**	**107.0**	**150.7**	**4.1**	**143.2**	**61.6**	**187.4**	**46.1**	**3,891.6**
Total per category	**3,191.6**	**261.8**			**392.1**			**46.1**	**3,891.6**
% per category	**82.0%**	**6.7%**			**10.1%**			**1.2%**	**100.0%**

Table 5-12 Carnaby's Cockatoo foraging habitat quality (Bamford 2021) – area (ha) per score s habitat type

Habitat type	None	Low			Moderate			High	Total
	0	1	3	4	5	6	7	8	
Bluegum plantation		415.4							415.4
Cleared		2666.0							2666.0
Cleared - degraded sumpland		8.1							8.1
Dam	1.7								1.7
Marri-Jarrah-Peppermint woodland				4.1	31.5	122.6	130.7	33.0	322.0
Open woodland of Peppermint trees (degraded)				98.9					98.9
Pine plantation				1.6					1.6
Seasonally inundated paperbark woodland (wetland)			11.2	18.5	115.2				144.9
Seasonally inundated sedgeland (wetland)			37.2	9.0	60.7				107.0
Seasonally inundated shrubland (wetland)			5.8	9.5	84.4	26.383			126.1
Total per score	**1.7**	**3089.5**	**54.2**	**141.7**	**291.8**	**149.0**	**130.7**	**33.0**	**3891.6**
Total per category	**1.7**	**3285.3**			**571.5**			**33.0**	**3891.6**
% per category	**0.04%**	**84.4%**			**14.7%**			**0.8%**	**100%**

Table 5-13 Forest Red-tailed Black Cockatoo foraging habitat quality (Bamford 2021) – area (ha) per score and habitat type

Habitat type	None	Low		Moderate			High		Total
	0	3	4	5	6	7	8	10	
Bluegum plantation	415.4								415.4
Cleared	2,666.0								2,666.0
Cleared - degraded sumpland	8.1								8.1
Dam	1.7								1.7
Marri-Jarrah-Peppermint woodland					64.2	87.2	170.2	0.3	322.0
Open woodland of Peppermint trees (degraded)	98.9								98.9
Pine plantation	1.6								1.6
Seasonally inundated paperbark woodland (wetland)	144.9								144.9
Seasonally inundated sedgeland (wetland)	107.0								107.0
Seasonally inundated shrubland (wetland)		5.8	10.2	110.1					126.1
Total per score	**3,443.6**	**5.8**	**10.2**	**110.1**	**64.2**	**87.2**	**170.2**	**0.3**	**3,891.6**
Total per category	**3,443.6**	**15.9**		**261.6**			**170.5**		**3,891.6**
% per category	**88.5%**	**0.4%**		**6.7%**			**4.4%**		**100%**



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- Study area
- Rivers
- Baudin's Cockatoo records

Habitat score (Bamford 2021 method)

- None (0)
- Low (1-4)
- Moderate (5-7)
- High (8-10)

Figure 5-10
Baudin's Cockatoo foraging habitat quality (Bamford 2021 method)

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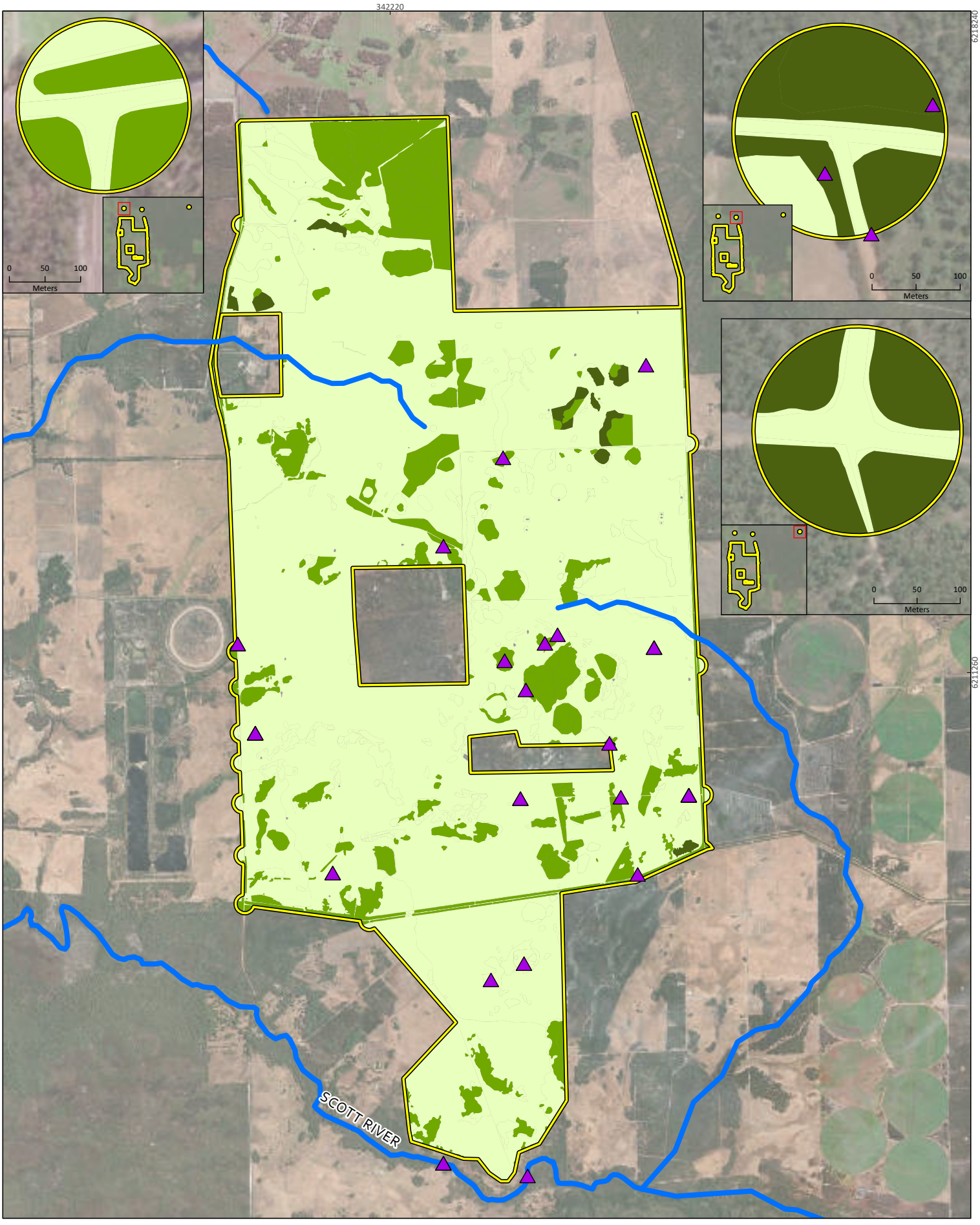

Western Australia
PERTH

SynergyRED
Beenup Wind Farm

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Study area
Rivers
Carnaby's Cockatoo records

Habitat score
None (0)
Low (1-4)
Moderate (5-7)
High (8-10)

Figure 5-11
Carnaby's Cockatoo foraging habitat quality (Bamford 2021 method)

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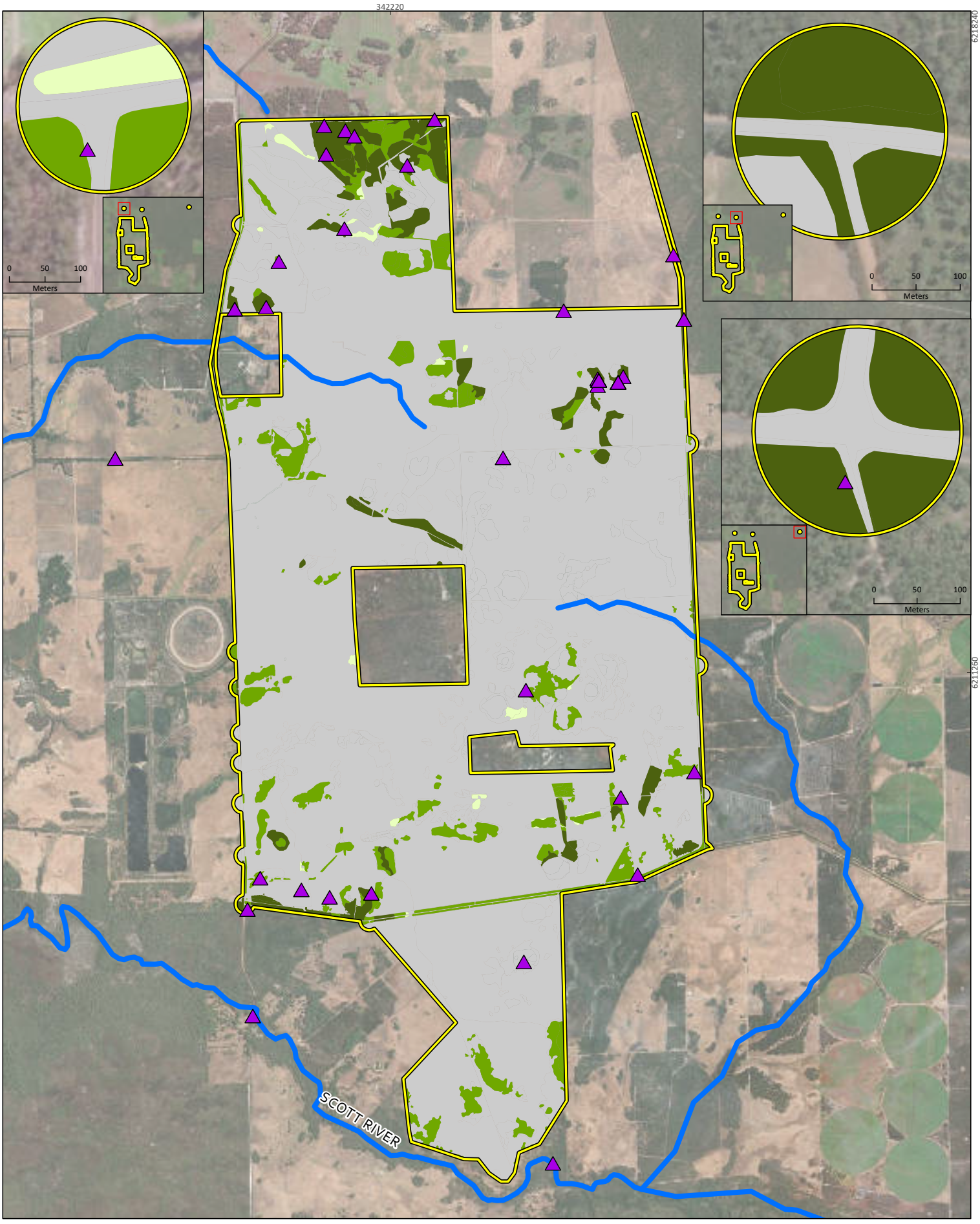

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Study area
Rivers
Forest Red-tailed Black Cockatoo records

Habitat score
None (0)
Low (1-4)
Moderate (5-7)
High (8-10)

Figure 5-12
Forest Red-tailed Black Cockatoo foraging habitat quality (Bamford 2021 method)

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5.2.4.2 Western Ringtail Possum habitat

Based on the habitat quality calculations for Western Ringtail Possum, 103.0 ha (2.6% of the study area) was found to be of moderate-quality and 98.0 ha (2.5%) was found to be of high-quality (Table 5-14; Figure 5-13). The remainder of the study area (94.8%) was classified as low-quality habitat, or as not habitat for the species (Table 5-14; Figure 5-13). A more detailed breakdown of the habitat value calculations is provided in Appendix 10.

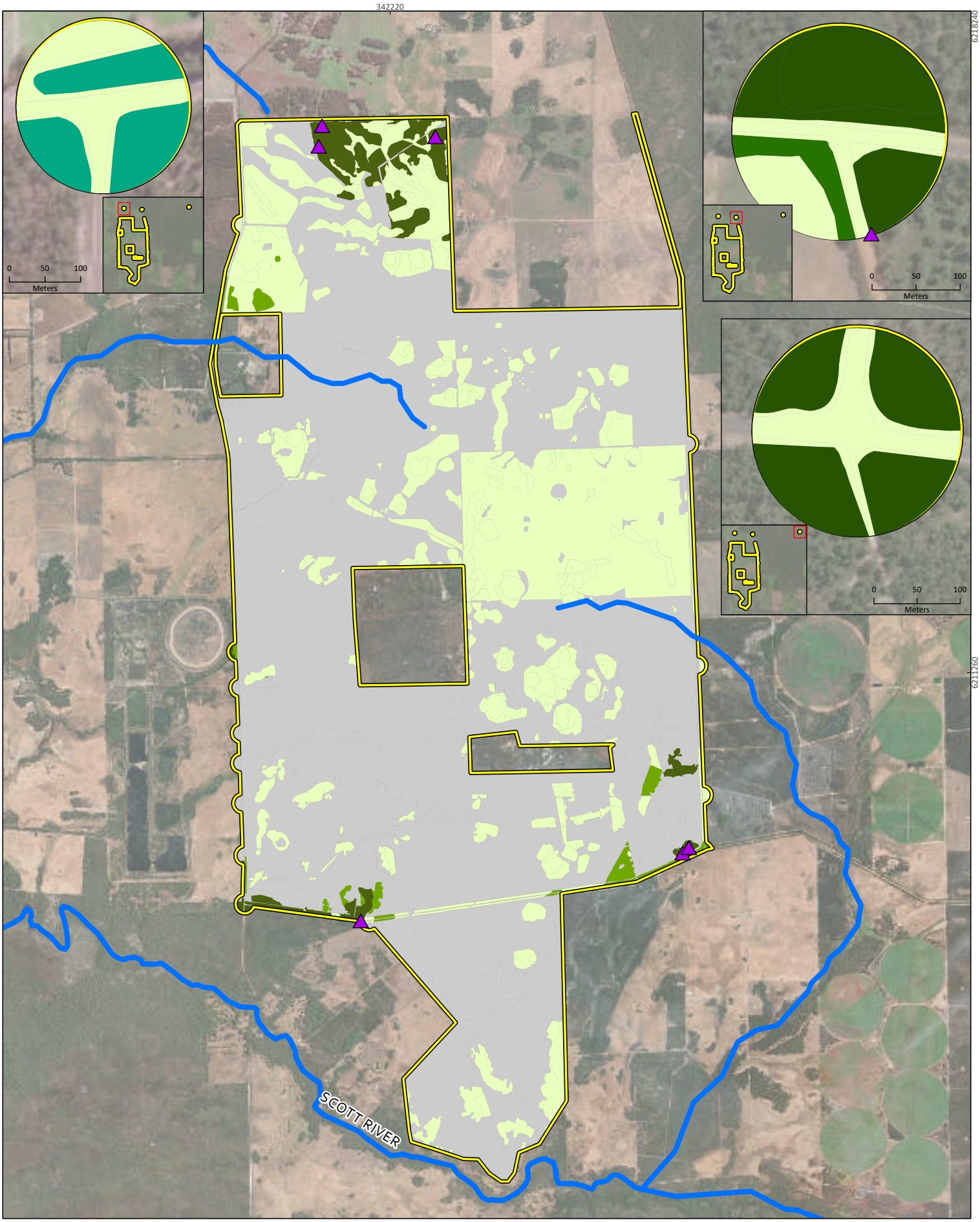
High-quality and moderate-quality habitat was confined to a single habitat type, Marri-Jarrah-Peppermint woodland (Table 5-14). Low-value habitat was represented by Bluegum plantation, Open woodland of Peppermint trees (degraded), Seasonally inundated paperbark woodland (wetland), Seasonally inundated sedgeland (wetland), Seasonally inundated shrubland (wetland) and poor condition, isolated or low density (reduced canopy cover) Marri-Jarrah-Peppermint woodland. While stands of Peppermint are typically associated with the Western Ringtail Possum, in the study area these stands are largely in poor condition lacking mid and understorey species, due to them being accessed by cattle. They are also typically isolated by more than 50 m of open paddock which acts to prevent this arboreal species from moving between those patches and other native habitats.

Bluegum plantation was classified as low-quality for Western Ringtail Possum as the species is known to utilise such habitat, but their typical usage is restricted to the margins where they border suitable native vegetation, particularly riparian zones (DPaW 2017b), both of which occur within the large plantation located in the mid-eastern portion of the study area and the smaller north-western plantation.

Large areas of contiguous suitable habitat for Western Ringtail Possum occur adjacent to the study area in the north-east, east of Dennis Road in State Forest and also to the south in Scott National Park (Figure 3-4; Figure 5-13).

Table 5-14 Western Ringtail Possum habitat quality – area (ha) per quality rating and habitat type

Fauna habitat	None	Low	Moderate	High	Total
Bluegum plantation		415.4	0	0	415.4
Cleared	2,666	0	0	0	2,666
Cleared - degraded sumpland	8.1	0	0	0	8.1
Dam	1.7	0	0	0	1.7
Marri-Jarrah-Peppermint woodland	32.5	88.4	103	98	321.9
Open woodland of Peppermint trees (degraded)	50.7	48.1	0	0	98.8
Pine plantation	1.6	0	0	0	1.6
Seasonally inundated paperbark woodland (wetland)		145	0	0	145
Seasonally inundated sedgeland (wetland)		107	0	0	107
Seasonally inundated shrubland (wetland)	5.1	121	0	0	126.1
Total area (ha)	**2,765.70**	**924.9**	**103**	**98**	**3,891.60**
% of study area per score	**71.1%**	**23.8%**	**2.6%**	**2.5%**	**100.0%**



SynergyRED
Beenup Wind Farm

Project No	1583
Date	17/04/2025
Drawn by	BK
Map author	JC

0 1 2
Kilometers

1:52,800 (at A4) GDA 1994 MGA Zone 50

All information within this map is current as of 17/04/2025. This product is subject to COPYRIGHT and is property of Phoenix Environmental Sciences (Phoenix). While Phoenix has taken care to ensure the accuracy of this product, Phoenix make no representations or warranties about its accuracy, completeness or suitability for any particular purpose.

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- Study area
- Rivers
- Western Ringtail Possum records

Habitat score

- None (0)
- Low (0.5-4.5)
- Moderate (5-7.5)
- High (8-10)

Figure 5-13
Western Ringtail Possum habitat

PHOENIX ENVIRONMENTAL SCIENCES

5.2.5 Likelihood of occurrence assessment

The likelihood of occurrence assessment for the significant species identified in the desktop review is provided in Table 5-15. In addition to the 10 recorded species, 4 species are considered as likely to occur, based on the currency and proximity of desktop records and suitability of habitat in the study area: Short-nosed Snake, Blue-billed Duck, Common Greenshank and South-western Brush-tailed Phascogale. A further 14 species are considered to possibly occur (Table 5-15), including 11 Migratory birds, 2 mammals and one other bird species.

Use of the study area by the Migratory shorebirds that are considered to be likely or possibly occurring is mostly limited to the spring months. Based on the Migratory shorebird data from ALA (section 5.1.3), birds typically start arriving in the Southwest region in September. Many of the wetlands in the study area have either dried already or are in the process of receding by October. In wetter years suitable habitat may persist further into late spring.

The remaining 42 species in Table 5-15 were considered unlikely to occur in the study area (35 species), or unlikely (rare) (7 species, all Migratory shorebirds). Two Threatened frogs, and 3 Threatened mammals are unlikely to occur either due to current distributions being outside the study area or no suitable habitat being present (Table 5-15). All of the pelagic birds (i.e. the albatrosses, petrels, shearwaters and Pomarine Jaeger) are unlikely to occur as they do not utilise inland habitats.

Table 5-15 Likelihood of occurrence for significant vertebrate fauna identified in the desktop review

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Amphibia (2)															
Anstisia alba White-bellied Frog	CR (EPBC & BC Acts)	9.8 km WNW of study area	Distribution is extremely restricted and fragmented occurring in an area north and west of the Blackwood River between Margaret River and Augusta. Inhabits permanently moist sites of U-shaped drainage depressions with swampy floors within undulating to hilly country on Leeuwin Block granite and narrow V-shaped valleys on laterised Perth Basin Sediments (DCCEEW 2024m; Wardell-Johnson *et al.* 1995).	Unlikely	Species distribution is outside (roughly 10 km NW of) the study area. Study area does not contain habitat features the species is associated with.										
Anstisia vitellina Orange-bellied Frog	VU (EPBC & BC Acts)	7.8 km N of study area	Distribution is extremely restricted, with the species appearing to reflect very localised suitable habitat conditions. Occurs in permanently moist sites in broad U-shaped valleys where there is marked topographic relief but rarely found on valley floor; abundant at seepages (DCCEEW 2024l; DPaW 2015; Wardell-Johnson *et al.* 1995).	Unlikely	Species distribution is outside (roughly 8 km N of) the study area. Study area does not contain habitat features the species is associated with.										
Reptilia (1)															
Elapognathus minor Short-nosed Snake	P2 (DBCA list)	3.2 km ESE of study area	Occurs in heath along the margin of swamps, in sedgeland and in wet sclerophyll forests growing on sandy soil in far south-west of WA. Associated with ephemeral wetlands and shelters in low dense vegetation such as tussocks and sedges (Craig *et al.* 2017).	Likely	Recently recorded in close proximity. Suitable habitat present.	●	●	●	●						

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Aves (58)															
Actitis hypoleucos Common Sandpiper	Mig. (EPBC & BC Acts)	0.5 km W of study area	Small ponds, large inlets, mudflats where they forage on the shore usually close to the vegetation (DCCEEW 2024j). Uses a wide variety of coastal wetlands and some inland wetlands. Species arrives in the Southwest in Sept-Oct (DCCEEW 2024j).	Possible	Nearby record. Suitable habitat present, but receding as species arrives in the Southwest, therefore, may be a temporary, seasonal visitor.	●	●	●							
Anarhynchus bicinctus Double-banded Plover	Mig. (EPBC & BC Acts)	1.9 km W of study area	Found on littoral, estuarine and fresh or saline terrestrial wetlands, rivers, saltmarshes, lagoons, grasslands and pasture. Also occurs on muddy, sandy, shingled or rocky beaches, bays and inlets (DCCEEW 2024s).	Possible (rare)	Previous desktop records <10 km from the WFA but old (1979-80) and from a single site near the artificial wetlands. No other desktop records returned. While the species is known to use terrestrial wetlands and pasture near the coast, it only occurs rarely in WA. Therefore, considered unlikely to occur except as possibly a very rare visitor.	●	●	●			●	●			

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Anarhynchus leschenaultii Greater Sand Plover	VU/Mig. (EPBC Act); VU (BC Act)	1.9 km W of study area	Utilises coastal and estuarine environments. Typically occupies sheltered sandy or muddy beaches, as well as intertidal sandbanks, mudflats, reefs and rock platforms. Occasional records from saltworks, salt lakes and marginal saltmarshes and brackish swamps (DAWE 2023; TSSC 2016).	Unlikely	Nearby record. Inhabits coastal habitats, no suitable habitat present in study area.										
Anarhynchus mongolus Siberian Sand Plover	EN/Mig. (EPBC Act); EN (BC Act)	1.9 km W of study area	Typically found in coastal and estuarine environments. Utilises intertidal mudflats and sandflats, as well as sheltered harbours. Occasionally occupies sandy beaches, rock platforms, saltmarshes, mangrove saltworks, brackish swamps and silt islands (DCCEEW 2024t).	Possible (rare)	Nearby record but mainly occurs in coastal habitats. Main habitats not present.	●	●	●							
Anous tenuirostris melanops Australian Lesser Noddy	VU (EPBC Act); EN (BC Act)	Proj. dist. (DCCEEW 2023c)	Nests in mangroves on offshore islands and mostly remain near breeding islands. Large oceanic foraging range (Surman *et al.* 2017). Gales can displace birds many hundreds of kilometres (DCCEEW 2024k; TSSC 2015a).	Unlikely	Desktop record is projected distribution only. No nearby records, and no suitable foraging habitat in the study area.										
Apus pacificus Fork-tailed Swift	Mig. (EPBC & BC Acts)	Proj. dist. (DCCEEW 2023c)	Occurs in a wide range of dry or open habitats, including riparian woodlands, tea tree swamps, low scrub, heathland, saltmarsh, grassland and spinifex sandplains, open farmland and inland and coastal sand dunes (DCCEEW 2021).	Possible	Within species distribution, but no nearby records. Occupies wide range of habitats. Aerial feeder, may feed on insects over the study area on occasion.	●	●	●	●	●	●	●	●		

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Ardenna carneipes Flesh-footed shearwater	VU/Mig. (BC Act)	Proj. dist. (DCCEEW 2023c)	Continental shelves and slopes and occasionally inshore waters (DCCEEW 2024n).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										
Ardenna grisea Sooty Shearwater	Mig. (BC Act)	Proj. dist. (DCCEEW 2023c)	Marine and highly pelagic, usually being found far from land except during the breeding season.	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										
Arenaria interpres Ruddy Turnstone	VU/Mig. (EPBC Act); Mig. (BC Act)	7 km S (offshore) and 12 km west (Hardy Inlet) of study area	Found in coastal regions containing exposed rocks, tidal pools, coral reefs and sandy beaches. Occasionally found in estuaries, harbours and lagoons. Can also live away from coastal areas in habitats such as riverbeds, and on inland lakes and adjacent farmland. Has also been recorded on sewage ponds and on mudflats (DCCEEW 2024o).	Unlikely	Limited desktop records, associated with Hardy Inlet and coast. Species mainly uses coastal habitats.	●	●	●							

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Botaurus poiciloptilus Australasian Bittern	EN (EPBC & BC Acts)	Hardy Inlet ~12 km SW and the Gingilup/ Quitchup/ Jasper wetlands ~30 km SE	Found in large, relatively undisturbed, freshwater or brackish swamps with dense vegetation (Birdlife Australia 2013), including wetlands on the south coast from Augusta to Cape Arid. Habitat critical to survival is described as generally large, fresh to moderately brackish wetlands with pH of 5.5-8.5 (DBCA 2018a). Extensive areas of water plants, especially rushes, reeds and sedges, provide habitat and support abundant prey (Pickering 2013). Shallow water, less than 30 cm deep with low to medium density of water plants mixed with, or near short fine sedges are favoured for foraging while higher density emergent vegetation is preferred for nesting (Jaensch 1982; A. Clarke, pers. comm. 2017). In the SW, occurs in wetlands where thickets of wetland shrubs (e.g. *Melaleuca*, *Agonis* spp.) provide patches of tall cover within sedge-dominated habitat (DCCEEW 2022b).	Possible (rare)	WFA is within known range and potentially suitable habitat is present. No previous records within 10 km (nearest desktop records from Hardy Inlet ~12 km SW and Gingilup/ wetlands ~30 km SE, dates unknown). While targeted searches and ARUs deployed did not detect the species during the surveys, potential for occasional presence cannot be discounted. Potential for occasional use of the larger wetlands in the WFA but unlikely a regular visitor or regularly transit through the WFA.	●	●	●							

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Calidris acuminata Sharp-tailed Sandpiper	VU/Mig. (EPBC Act); Mig. (BC Act)	1.2 km W of study area	Muddy edges of shallow fresh or brackish vegetated wetlands, including lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hyper-saline salt lakes inland (DCCEEW 2024a).	Possible	Nearby record. Suitable habitat present in the seasonally inundated wetland types in early spring, coinciding with arrival of the species in the Southwest. Therefore, may be a temporary, seasonal visitor.	●	●	●					●		
Calidris alba Sanderling	Mig. (EPBC & BC Acts)	1.9 km W of study area	Utilises coastal environments open to sea swell, sandbars, spits and shingle banks. Also occur on wave-washed rock outcrops. Less frequently found in estuaries and inlet harbours and near-coastal inland wetlands (DCCEEW 2024p).	Unlikely	Nearby record; however, the species almost always prefers coastal habitats.										
Calidris canutus Red Knot	VU/Mig. (EPBC Act); EN (BC Act)	1.9 km W of study area	Typically occupies intertidal mudflats, sandflats and sheltered coasts. Also known to utilise beaches, lagoons and harbours. Has also been recorded from saline terrestrial wetlands and sewage ponds. Rarely found in freshwater swamps (DCCEEW 2024q).	Unlikely	Nearby record but mainly occurs in coastal habitats.										

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Calidris falcinellus Broad-billed Sandpiper	Mig. (BC Act)	1.9 km W of study area	Found in sheltered coastal environments, mudflats and favours estuarine habitats. Occasionally in saltmarshes, freshwater lagoons, saltworks and sewage farms. Has also been known to occupy creeks, swamps and lakes near the coast, favouring those with mudflats and exposed sands with receding tides (DCCEEW 2024v).	Possible (rare)	Old (1979-80) desktop records <10 km of WFA from site near the artificial wetlands. All recent desktop records are from the Hardy Inlet. Mainly uses sheltered coastal habitats, favouring estuarine mudflats. Only occasional records from swamps and lakes. Arrives in southwest in September but rare.	●	●	●							
Calidris ferruginea Curlew Sandpiper	CR/Mig. (EPBC Act); CR (BC Act)	1.9 km W of study area	Occurs on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons. Known to favour non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. Also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bores/drains, usually with bare edges of mud or sand (DCCEEW 2024r).	Possible	Nearby record. Suitable habitat present. Arrives in Southwest in spring therefore may be a temporary, seasonal visitor.	●	●	●			●	●	●		

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Calidris melanotos Pectoral Sandpiper	Mig. (EPBC & BC Acts)	12.7 km SWS of study area	Utilises shallow fresh to saline wetlands such as coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands (DCCEEW 2023b).	Possible	Nearby record. Suitable habitat present. Arrives in Southwest in spring. Arrives in Southwest in spring therefore may be a temporary, seasonal visitor.	●	●	●			●	●			
Calidris ruficollis Red-necked Stint	Mig. (EPBC & BC Acts)	1.9 km W of study area	Found across a wide range of open mudflat-like habitats in salt and freshwater systems (DCCEEW 2024ae).	Possible	Old (1979-80) desktop records within 10 km of WFA from site near the artificial wetlands. All recent desktop records are from the Hardy Inlet. Prefers sheltered coastal habitats with large intertidal flats. Rarely uses swamps near the coast and saltlakes. Uncommon in the southwest.	●	●	●			●	●	●		
Calidris tenuirostris Great Knot	VU/Mig. (EPBC Act); CR (BC Act)	1.9 km W of study area	Usually occupies sheltered coastal habitats, mudflats and sandflats such as inlets, bays, harbours, estuaries and lagoons. Known to use reefs and rock platforms, as well as shorelines and mangroves. There are also records in swamps near the coast, salt lakes and non-tidal lagoons (DAWE 2021a).	Possible (rare)	Nearby record but mainly occurs in coastal habitats. Uncommon in the Southwest.	●	●	●							

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Calyptorhynchus banksii naso Forest Red-tailed Black Cockatoo	VU (EPBC & BC Acts)	Within study area	Occurs in dense Jarrah, Karri and Marri forests, mainly in the hilly interior, and a range of other forest and woodland types (DCCEEW 2024f).	Recorded		●	●	●	●	●					
Charadrius cucullatus Hooded Plover	P4 (DBCA list)	3.3 km S of study area	In WA, is found on ocean beaches. Occasionally occurs inland on the edges of lakes, on nearby grassy freshwater seepages and in estuaries (Birdlife Australia N.D.; TSSC 2014).	Unlikely	Nearby record but is from sandy beach habitat. No suitable habitat present.										
Diomedea amsterdamensis Amsterdam Albatross	EN/Mig./CR/Mig. (EPBC Act; BC Act)	Proj. dist.	A marine pelagic species that flies large circumpolar distances, only landing to breed and feed. Breeds on offshore islands (Birdlife International 2018).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										
Diomedea dabbenena Tristan Albatross	EN/Mig. (EPBC Act); CR/Mig. (BC Act)	Proj. dist.	A marine pelagic species that flies large circumpolar distances, only landing to breed and feed. Breeds on offshore islands (Birdlife International 2018).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										
Diomedea epomophora Southern Royal Albatross	VU/Mig. (EPBC & BC Acts)	Proj. dist.	A marine pelagic species that flies large circumpolar distances, only landing to breed and feed. Breeds on offshore islands (Birdlife International 2018).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Diomedea exulans Wandering Albatross	VU/Mig. (EPBC & BC Acts)	14.0 km ESE of study area	A marine pelagic species that flies large circumpolar distances, only landing to breed and feed. Breeds on offshore islands (Birdlife International 2018).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										
Diomedea sanfordi Northern Royal Albatross	EN/Mig. (EPBC & BC Acts)	Proj. dist.	A marine pelagic species that flies large circumpolar distances, only landing to breed and feed. Breeds on offshore islands (Birdlife International 2018).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										
Falco peregrinus Peregrine Falcon	OS (BC Act)	0.9 km S of study area	Preferred habitat includes cliffs and wooded watercourses. Nesting occurs mainly on cliff ledges, granite outcrops, quarries and in trees with old Raven or Wedge-tailed Eagle nests (Johnstone & Storr 1998). Also build nests on human structures such as utility poles.	Recorded			●	●	●	●	●	●	●	●	●
Halobaena caerulea Blue Petrel	VU (EPBC Act)	Proj. dist.	Marine and highly pelagic, usually being found far from land except during the breeding season.	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										
Hydroprogne caspia Caspian Tern	Mig. (EPBC & BC Acts)	1.0 km W of study area	Found in sheltered coastal embayments (such as harbours, lagoons, inlets, bays, estuaries and river deltas). Also occur on near-coastal or inland terrestrial wetlands that are either fresh or saline, but especially lakes, and artificial wetlands and reservoirs and near-coastal terrestrial wetlands (DCCEEW 2024u). Common in the Blackwood River estuary.	Poissible (rare)	Nearby record. Wetlands present are shallow and unlikely to provide the food sources the species requires.										

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Leipoa ocellata Malleefowl	VU (EPBC & BC Acts)	1.2 km SSW of study area	Mainly occurs in scrubs and thickets of mallee (*Eucalyptus* spp.), boree (*Melaleuca lanceolata*) and bowgada (*Acacia linophylla*), and other dense litter-forming shrublands including mulga shrublands (Johnstone & Storr 2004). Nest mounds require sandy soil and abundant litter (Benshemesh 2007).	Unlikely	Limited, degraded habitat present. Only 3 desktop records and are from 1916 (2) and 1962. Current distribution is unlikely to extend to study area.										
Limosa lapponica Bar-tailed Godwit	Mig. (EPBC & BC Acts)	1.9 km W of study area	Occurs in intertidal sandflats, banks, mudflats, estuaries coastal lagoons and harbours. Has also been found on occasion on inland wetlands or in areas of short grass, such as paddocks (DCCEEW 2024w).	Possible (rare)	Nearby record. Suitable habitat present but not primary habitat. Potential presence is considered likely very rare.		●	●			●	●			

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Limosa limosa Black-tailed Godwit	EN/Mig. (EPBC Act); Mig. (BC Act)	1.9 km W of study area	Typically found in coastal environments with sheltered bays, estuaries and lagoons, as well as shallow and sparsely vegetated near-coastal wetlands (DCCEEW 2024x). There are a few inland records, around shallow, freshwater and saline lakes, swamps, dams and bore-overflows. Habitat use is dictated by tides.	Recorded in BBRAS Regional sites, Possible (rare) in study area	Old (1980) desktop records <10 km of study area from a site near the artificial wetlands, and another near the Blackwood River. All other desktop records, including all recent records, are associated with the Hardy Inlet and coast. Survey records also only from Hardy Inlet Regional sites. Occurs almost entirely in coastal habitats such as intertidal sandflats, mudflats and estuaries. It has been observed on occasion on inland wetlands and paddocks but potential presence in the study area is considered very rare.										
Macronectes giganteus Southern Giant Petrel	EN/Mig. (EPBC Act); Mig. (BC Act)	Proj. dist.	Pelagic. Breeds on 6 subantarctic and Antarctic islands in Australian territory (DAWE 2021b).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Macronectes halli Northern Giant Petrel	VU/Mig. (EPBC Act); Mig. (BC Act)	Proj. dist.	Marine and highly pelagic, usually being found far from land except during the breeding season.	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										
Motacilla cinerea Grey Wagtail	Mig. (EPBC & BC Acts)	Proj. dist.	Uses a wide array of habitats. A small wagtail that is a vagrant visitor to mainly northern Australia that inhabits fast flowing streams and rivers (IUCN 2019).	Possible (rare)	Desktop record is projected distribution only. Suitable habitat is present but occurs in a wide range of habitats. Very few records of this species from the region. May occur in the study area on rare occasion only.										
Numenius madagascariensis Eastern Curlew	CR/Mig. (EPBC Act); CR (BC Act)	11.5 km W of study area	Mainly forages in sheltered intertidal sandflats and open bare mudflats. Also, near mangroves, on salt flats or saltmarsh, around rockpools, amongst rubble on coral reefs and beaches. Preference for soft substrate containing little or no hard material that provides better access to prey (TSSC 2015b).	Unlikely	Nearby record but no suitable habitat present.										
Numenius phaeopus Whimbrel	Mig. (EPBC & BC Acts)	1.9 km W of study area	Usually found on intertidal mudflats and sheltered coastal areas. Also occur in harbours, lagoons, estuaries, rivers and mangroves. Occasionally in sandy and rocky beaches (DCCEEW 2024y).	Unlikely	Nearby record but no suitable habitat present.										

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Onychoprion anaethetus Bridled Tern	Mig. (EPBC & BC Acts)	11.3 km W of study area	Occupies subtropical and tropical sea environments, including islands, coral cays with adequate vegetation, and continental islands. Rarely recorded on inshore continental waters. Has been reported breeding on mainland WA (DCCEEW 2024z).	Unlikely	Nearby record but no suitable habitat present.										
Oxyura australis Blue-billed Duck	P4 (DBCA list)	1.0 km W of study area	Endemic to Australia's temperate regions, inhabiting terrestrial wetlands (fresh or saline) with extensive bordering vegetation, including artificial wetland, such as sewage ponds (Birdlife International 2015; del Hoyo *et al.* 2014).	Likely	Previously recorded nearby from multiple sources. Suitable habitat present, particularly the larger lakes (SIPW wetlands).	●									
Pandion haliaetus Osprey	Mig. (EPBC & BC Acts)	1.2 km W of study area	Occurs in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. Utilises inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs, large lakes and waterholes. Requires extensive areas of open fresh, brackish or saline water for foraging (DCCEEW 2024g).	Recorded		●	●	●							
Phoebetria fusca Sooty Albatross	VU/Mig. (EPBC Act); EN/Mig. (BC Act)	Proj. dist.	A marine pelagic species that flies large circumpolar distances, only landing to breed and feed. Breeds on offshore islands in open or patchy vegetation near exposed ridges (Birdlife International 2018).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Pluvialis fulva Pacific Golden Plover	Mig. (EPBC & BC Acts)	1.9 km W of study area	Usually inhabits coastal habitats (e.g. beaches, mudflats and sandflats, harbours, estuaries and lagoons), but will use inland wetlands, such as fresh, brackish or saline lakes, billabongs, pools, swamps and wet claypans, especially those with muddy margins and often with submerged vegetation or short emergent grass. It may even use other terrestrial habitats such as short grass in paddocks (DAWE 2021c).	Possible	Nearby record. Suitable habitat present. May occur on occasion when they arrive in spring, before the ephemeral wetlands dry for the summer.	●	●	●			●	●			
Pluvialis squatarola Grey Plover	VU/Mig. (EPBC Act); Mig. (BC Acts)	11.0 km WSW of study area	Inhabits coastal areas, typically those that are sheltered, such as embayments and estuaries, although is also known to occupy rocky coasts and platforms. Occasionally found in inland waterbodies (DCCEEW 2024aa).	Possible (rare)	Nearby record from the Blackwood River but Grey Plovers occur mostly in coastal habitats.	●	●	●							
Pterodroma mollis Soft-plumaged Petrel	VU (EPBC Act)	Proj. dist.	Marine and highly pelagic, usually being found far from land except during the breeding season (Birdlife International 2018).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										
Stercorarius pomarinus Pomarine Jaeger	Mig. (EPBC & BC Acts)	11.1 km WSW of study area	Marine and highly pelagic, usually being found far from land except during the breeding season (Birdlife International 2018).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Sternula nereis nereis Fairy Tern	VU (EPBC & BC Acts)	7.0 km WSW of study area	In WA, is present along the entire coastline, with rare records from the far north (Kimberley) and off the Nullarbor Plain. Occurs in offshore, estuarine or lacustrine (lake) islands, wetlands, beaches and spits (DCCEEW 2024ab). Nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation.	Unlikely	Desktop record is projected distribution only. No nearby records. Occurs in coastal habitats. No suitable habitat present.										
Thalassarche carteri Indian Yellow-nosed Albatross	VU/Mig. (EPBC Act); EN/Mig. (BC Act)	6.8 km SW of study area	A marine pelagic species that flies large circumpolar distances, only landing to breed and feed. Breeds on offshore islands (Birdlife International 2018).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										
Thalassarche cauta Shy Albatross	VU/Mig. (EPBC & BC Acts)	Proj. dist.	A marine pelagic species that flies large circumpolar distances, only landing to breed and feed. Breeds on offshore islands (Birdlife International 2018).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										
Thalassarche chlororhynchos Atlantic Yellow-nosed Albatross	VU/Mig. (BC Act)	6.5 km SW of study area	A marine pelagic species that flies large circumpolar distances, only landing to breed and feed. Breeds on offshore islands (Birdlife International 2018).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										
Thalassarche impavida Campbell Albatross	VU/Mig. (EPBC & BC Acts)	Proj. dist.	A marine pelagic species that flies large circumpolar distances, only landing to breed and feed. Breeds on offshore islands (Birdlife International 2018).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Thalassarche melanophris Black-browed Albatross	VU/Mig. (EPBC Act); EN/Mig. (BC Act)	11.4 km W of study area	A marine pelagic species that flies large circumpolar distances, only landing to breed and feed. Breeds on offshore islands (Birdlife International 2018).	Unlikely	Marine pelagic species. Doesn't utilise inland habitats.										
Thalasseus bergii Greater Crested Tern	Mig. (EPBC & BC Acts)	1.9 km W of study area	Occurs in temperate and tropical environments. Found in coastal areas including low-lying rocky, sandy and coral islands. Persist in areas with a distinct lack of shelter. Often found on open shores, less often in tidal creeks and inland waterbodies (ALA 2023).	Unlikely	Nearby records but mostly associated with the Blackwood River estuary and the coast. No suitable habitat present.										
Tringa brevipes Grey-tailed Tattler	Mig. (EPBC and BC Acts); P4 DBCA list	6.9 km SSE of study area	Occurs on sheltered coasts with reefs and rock platforms or mudflats and can also be found on reefs or platforms that are exposed at low tide (DCCEEW 2024ac). It is occasionally found around near-coastal wetlands, such as lagoons, and lakes and ponds, in sewage farms and saltworks. Inland records for the species are rare (Higgins & Davies 1996).	Possible (rare)	Nearby record. Inland records for the species are rare. Main habitats not present.										
Tringa Glareola Wood Sandpiper	Mig. (EPBC & BC Acts)	0.5 km W of study area	Mostly on the coast but sometimes inland; uses permanent and ephemeral terrestrial wetlands, including rivers and creeks (DCCEEW 2024e).	Recorded		●	●	●							

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Tringa nebularia Common Greenshank	EN/Mig. (EPBC Act); Mig. (BC Act)	0.5 km W of study area	Mostly occurs on the coast but sometimes inland; uses permanent and ephemeral terrestrial wetlands, and waterways (DCCEEW 2024d). Found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and salt flats (DCCEEW 2024b).	Likely	Nearby record. Suitable habitat present when they arrive in early spring.	●	●	●				●	●		
Tringa stagnatilis Marsh Sandpiper	Mig. (EPBC & BC Acts)	12.5 km SW of study area	Mostly occurs on the coast but sometimes inland; uses permanent and ephemeral terrestrial wetlands, including rivers and creeks (DCCEEW 2024ad).	Possible	No previous desktop records <10 km of study area, last record in December 2000 (BirdLife 2023) at Swan Lake which is part of the Hardy Inlet. Inhabits a range of permanent or ephemeral wetlands and inundated floodplains. Suitable habitat present when species arrives in southwest in early spring.	●	●	●					●		

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Tyto novaehollandiae novaehollandiae Masked Owl	P3 (DBCA list)	1.0 km S of study area	Has a preference for woodlands with large old trees in the proximity to open grasslands where it can hunt for (Marchant & Higgins 1993).	Recorded					●	●				●	
Zanda baudinii Baudin's Cockatoo	EN (EPBC & BC Acts)	Within study area	Occurs in eucalypt forests, especially Jarrah, Marri and Karri forest and less frequently in woodlands of Wandoo, Blackbutt, Flooded Gum, Yate, partly cleared farmlands and urban areas (DCCEEW 2024h).	Recorded		●	●	●	●	●		●		●	
Zanda latirostris Carnaby's Cockatoo	EN (EPBC & BC Acts)	Within study area	Occurs in uncleared or remnant native eucalypt woodlands, and in shrublands or kwongan heathlands dominated by *Hakea*, *Dryandra*, *Banksia* and *Grevillea* species (DCCEEW 2024i; Garnett & Crowley 2000; Weerheim 2008).	Recorded		●	●	●	●					●	●
Mammalia (10)															
Bettongia penicillata ogilbyi Woylie	EN (EPBC Act); CR (BC Act)	9.9 km SE of study area	Inhabited a wide range of landscapes prior to European colonisation. Remnant subpopulations inhabit woodlands and adjacent heaths with a dense understorey of shrubs, particularly *Gastrolobium* spp. (poison pea) (TSSC 2018).	Unlikely	Desktop records are from 1920 and otherwise un-dated. Study area occurs outside the species current range (ALA 2024).										

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Dasyurus geoffroii Chuditch	VU (EPBC & BC Acts)	9.9 km SE of study area	Confined to south-WA, occurring in only 5% of its former range. Mostly found in Jarrah Forest and woodland of the Southwest or heath and mallee habitats along the south coast. Uses horizontal hollow logs or earth burrows as refugia and dens (DEC 2012b).	Possible	Nearby record. While Chuditch will disperse long distances the closest records are old, pre-dating 1934. Suitable habitat present, though somewhat marginal. Numerous unexpected sightings in the Southwest in recent years. Potential for presence therefore cannot be discounted.	●	●	●	●	●				●	
Falsistrellus mackenziei Western False Pipistrelle	P4 (DBCA list)	1.2 km W of study area	Restricted to area in or adjacent to high rainfall old-growth forest. Wet sclerophyll dominated by Karri and Marri, and in Jarrah and Tuart in higher rainfall areas (Armstrong *et al.* 2017). Forages in woodland habitats.	Recorded					●	●					

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Hydromys chrysogaster Water-rat	P4 (DBCA list)	4.4 km W of study area	In the Southwest, occupies habitats in the vicinity of permanent water, favouring areas with dense, low-lying vegetation, low density canopy cover, good water quality, narrow water bodies and some habitat complexity (DEC 2012c; Speldewinde *et al.* 2013). It is likely that woody debris, rock ledges and wetland islands are important for refuge and feeding. Can also occur in mangrove and estuarine areas (IUCN 2019).	Unlikely	Few recent records nearby (latest 2007). Due to ephemeral nature of wetlands in study area no suitable habitat present. More likely to occur on the Scott River and Blackwood River (located south and west of the study area, respectively), which retain dense riparian vegetation and perches, as well as water and pools all year.										
Isoodon fusciventer Quenda	P4 (DBCA list)	1.1 km SE of study area	Found in scrubby vegetation with dense cover up to 1 m high, often around swamps, wetlands or in *Banksia* and Jarrah woodland. Feeds in frequently burnt forest and woodland lying close to dense cover. Populations inhabiting Jarrah and Wandoo forests are usually associated with watercourses. Also occurs in more open habitat if it is subjected to introduced predator control (DBCA 2018b).	Recorded		●	●	●	●						

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Myrmecobius fasciatus Numbat	EN (EPBC & BC Acts)	Proj. dist.	Now restricted to 2 isolated wild populations in the Southwest. Nests in hollow logs, trees or in burrows. Inhabits eucalypt woodland and forests with abundant termites, and hollow logs for shelter (DPaW 2017a).	Unlikely	Study area occurs outside of current known range. Desktop record is projected distribution only.										
Notamacropus irma Western Brush Wallaby	P4 (DBCA list)	11.4 km NNW of study area	Grazing species, occurs in open forest or woodland with low grasses and scrubby thickets, and also found in some areas of mallee and heathland (DEC 2012d). Prefers open grassy areas and is absent in Karri forests with dense understorey (Woinarski & Burbidge 2016).	Possible	Few desktop records but including some relatively close (11.4 km) and recent (2019, 2010) records. Suitable habitat present, particularly in the large remnant bushland on the northern-central boundary of the WFA.				●						
Phascogale tapoatafa wambenger South-western Brush-tailed Phascogale	CD (BC Act)	7.4 km W of study area	Occurs in mature dry sclerophyll forests and open woodlands that contain hollow-bearing trees. These nocturnal, arboreal carnivores forage for food under the bark of trees (DEC 2012a) and nest in the hollows of dead and mature Jarrah and Marri trees (Burbidge & Woinarksi 2020).	Likely	A few records close to the study area, including a relatively recent record in 2014. Suitable habitat present, particularly in the large remnant bushland on the northern-central boundary of the WFA.				●						

Species	Status	Proximity	Habitat	LOO	Justification	SIPW wetland	SISE wetland	SISH wetland	MJP woodland	OWP deg.	Cleared	Cleared - DS	Dam	Bluegum plant.	Pine plant.
Pseudocheirus occidentalis Western Ringtail Possum	CR (EPBC & BC Acts)	1.7 km N of study area	Found on the southern extremity of the Swan Coastal Plain and was formerly found in several types of forest and woodland (DPaW 2017b). Now mostly restricted to long-unburnt mature Peppermint/Tuart closed forest and relatively unburnt Jarrah and Marri forests and woodlands with limited disturbance. Also occurs in coastal heath, Peppermint woodland, myrtaceous heaths and shrubland, riparian zones and Karri forest (DPaW 2017b).	Recorded					●						
Setonix brachyurus Quokka	VU (EPBC & BC Acts)	3.0 km S of study area	A habitat specialist, inhabits dense riparian vegetation, but also uses a range of other habitats on the mainland, such as heath and shrublands, swamps, and forests (DCCEEW 2024d).	Unlikely	Study area occurs outside of current known range. Records close to study area are not recent (most recent dated 1984).										

5.3 SURVEY LIMITATIONS

The limitations of the terrestrial fauna survey have been considered in accordance with EPA (2016b) (Table 5-16).

Table 5-16 Consideration of potential survey limitations

Limitations	Limitation	Comments
Availability of contextual information at a regional and local scale	Minor	While conservation agencies have done several floristic surveys in the 'Scott River region', few comprehensive or systematic fauna surveys have been completed; including within the adjacent National Park and State Forest. The exceptions are Biota (2009) to the east but in somewhat different habitats, and Ninox (2011) immediately to the west, where birds were monitored in artificial lake/wetland habitat, largely incomparable to that of the study area. A total of 15 taxa not detected in the desktop review were recorded as evidence of this fact.
Competency/experience of the team carrying out the survey	None	The survey team members were adequately experienced in the methods and species being targeted.
Scope and completeness	None	The surveys undertaken and reported here are adequate to characterise the fauna habitats of the study area and surrounds with respect to the nature of the Project.
Proportion of fauna recorded and/or collected, any identification issues	None	Approximately 75% of expected amphibian species, 53% of expected birds and 48% of expected native mammals were recorded. Few reptiles were recorded but this reflects the Basic and Targeted survey methods deployed. A Detailed survey would be expected to record additional reptiles and mammals but was considered unnecessary given the very limited clearing of native vegetation proposed and the nature of the Project.
Access within the study area	None	There were areas that could not be accessed easily in winter due to extensive inundation of paddocks and tracks. However, over the 2-year survey period all areas were accessed.
Timing, rainfall, season	None	The timing of the fauna surveys were appropriate for the habitats and species potentially occurring. Winter and spring rainfall was less than the long-term average, but not insufficient to expect a lower detectability of any species.
Disturbance that may have affected the results of the survey	None	No disturbance affected the results of the survey.

6 DISCUSSION

6.1 FAUNA HABITATS AND ASSEMBLAGE

Most of the study area, approximately 80%, has been cleared for dairy, livestock and timber production. The paddocks and plantations provide limited habitat value to vertebrate fauna. Paddocks provide a limited food source for some species once seed has set, as evidenced from foraging records of Carnaby's Cockatoo and numerous waterbirds, some in abundance (e.g. Straw-necked Ibis and Australian Shelduck) when the paddocks were inundated. Dams provide a drinking water source for many species including black cockatoos. Bluegum and Pine plantations both provide limited support for Carnaby's Cockatoo and Baudin's Cockatoo. Both species feed on Pine nuts and north of Perth pine can be an important seasonal food source; however, that isn't the case in the study area and surrounds where the extent of native habitat is much greater and in better condition, compared with areas close to Perth.

The remaining ~20% of the study area comprises the 5 native fauna habitats. They are of overall higher value to fauna but display variable importance both between and within due to varying historical disturbances. These habitats comprise many small, isolated, and often degraded remnants of limited value. As well as larger patches which are typically in much better condition and therefore of higher relative value for fauna. Many of the large patches have been fenced off (with some even resumed by the State Government) to prevent stock access and thus protect floristic values and by association, fauna values.

When habitat value of the study area is considered relative to the surrounding landscape, it is of lower value in comparison to the expansive areas of intact conservation estate to the north, east and south-west of the study area. All 5 native habitat types in the study area, however, have some areas of significance for conservation significant fauna, as summarised in Table 6-1.

The current survey, in conjunction with the BBRAS (Phoenix 2025a), recorded 138 species (predominantly birds; 77%), including 10 conservation significant species. The dominance of birds in the assemblage was anticipated, considering the dominance of birds in the desktop species list and the survey methods which favour detection of avifauna.

The detection of roughly 52% of species relative to the number of species identified in the desktop is considered a reasonable result considering the survey was limited to a Basic and Targeted survey (i.e. no systematic trapping) and considering 80% of the study area is cleared or highly modified.

The high number of species (i.e. 15) recorded in the field that were not returned in the desktop review speaks to the limited fauna surveys having been done in the region, even within the regionally important Blackwood River National Park and Scott National Park. For example, only 3 species of bat were expected to occur based on the desktop data, but 8 species were recorded. The waterbird and vertebrate fauna monitoring of the adjacent Beenup artificial wetlands by Ninox (2011) between 2005-2011 are the best data available for comparison.

Given much of the study area is floodplain and wetland, the fauna assemblage was strongly seasonal. During the wetter months (May - September) the study area was dominated by waterbirds, including Straw-necked Ibis, Australian White Ibis, Australian Shelduck, Grey Teal, Black Swan, Pacific Black Duck and White-faced Heron. These were often observed in large aggregations. Ninox (2011) also commented on the seasonality of the bird assemblage; they also noted significant change in composition year to year at the Beenup artificial wetlands.

Table 6-1 Summary of native fauna habitat value for recorded conservation significant species in the study area

Habitat	Species and associated values in study area					
	Western Ringtail Possum	**Baudin's Cockatoo**	**Carnaby's Cockatoo**	**Forest Red-tailed Black Cockatoo**	**Migratory listed birds**	**Other**
Marri-Jarrah-Peppermint woodland	16 individuals, including females with juveniles confirmed from multiple remnants ~98 ha of high-quality habitat ~103 ha of moderate-quality habitat	Confirmed foraging activity Contains most PNT (357), including 4 'suitable' PNTs; but no 'known' nesting trees ~46 ha high-quality foraging habitat ~272 ha moderate-quality foraging habitat	Confirmed foraging activity ~79.3 ha of high-quality ~242.6 ha moderate-quality foraging habitat	Confirmed foraging activity Contains most PNT (357), including 4 'suitable' PNTs; but no 'known' nesting trees ~170 ha high-quality foraging habitat ~151 ha moderate-quality foraging habitat		Suitable habitat and record of Masked Owl (southwest) and Western False Pipistrelle Suitable habitat for Quenda, and Peregrine Falcon
Open woodland of Peppermint trees (degraded)	~48 ha of low-quality habitat	Contains 2 PNT, none suitable for current breeding	~99 ha of low-quality foraging habitat	Contains 2 PNT, none suitable for current breeding		Suitable habitat for Western False Pipistrelle, Masked Owl (southwest) and Peregrine Falcon
Seasonally inundated paperbark woodland (wetland)	~145 ha of low-quality habitat	~145 ha of low-quality foraging habitat Contains 14 PNT, none currently suitable for breeding	~145 ha of moderate-quality foraging habitat	Contains 14 PNT, none suitable for current breeding	Limited suitable foraging habitat for several species, restricted to spring and early summer months Record of Wood Sandpiper	Suitable habitat for Quenda, Peregrine Falcon and Osprey

Habitat	Species and associated values in study area					
	Western Ringtail Possum	**Baudin's Cockatoo**	**Carnaby's Cockatoo**	**Forest Red-tailed Black Cockatoo**	**Migratory listed birds**	**Other**
Seasonally inundated sedgeland (wetland)	~107 ha of low-quality habitat	Unidentified white-tailed black cockatoos seen foraging ~107 ha of low-quality foraging habitat	Unidentified white-tailed black cockatoos seen foraging ~107 ha of moderate-quality foraging habitat		Limited suitable foraging habitat for several species, restricted to spring and early summer months	Suitable habitat and record of Western False Pipistrelle Suitable habitat for Quenda, Peregrine Falcon and Osprey
Seasonally inundated shrubland (wetland)	~121 ha of low-quality habitat	~120 ha of moderate-quality foraging habitat ~6 ha of low-quality foraging habitat Contains 54 PNT, none currently suitable for breeding	~126 ha of moderate-quality foraging habitat	~110 ha of moderate-quality foraging habitat ~16 ha of low-quality foraging habitat Contains 54 PNT, none suitable for current breeding	Limited suitable foraging habitat for several species, restricted to spring and early summer months	Suitable habitat and record of Western False Pipistrelle and Quenda Suitable habitat for Peregrine Falcon and Osprey

Migratory shorebirds were entirely absent during the winter months, indicating the study area does not support overwintering birds. Most wetland habitats in the study area are only of foraging value to Migratory shorebirds in the spring and early summer months, between their arrival in the Southwest from September onwards and the drying out of most of the wetlands by late spring, though this may be later in wetter years. While a few wetlands remain inundated for longer (presumably due to water column depth and/or reduced evaporation rates), based on the field records of only a single Migratory shorebird species being recorded on one occasion, the wetland habitats of the study area do not represent important summer Migratory shorebird habitat either.

In contrast, Migratory shorebirds are common at the Hardy Inlet, on the Blackwood River generally further upstream on shallow sandbars, and on beaches east of Augusta south of the study area, over the spring and summer months, with diversity and abundance peaking in early January. The BBRAS (Phoenix 2025a) recorded a number of Migratory species at the Hardy Inlet that were not detected in the study area (as demarcated in BBRAS column of Appendix 7 as species on recorded at regional sites).

Further, immediately adjacent the study area at the Beenup artificial wetlands 7 shorebirds were detected by Ninox (2011) that were not recorded in the study area (i.e. Common Sandpiper, Common Greenshank, Sharp-tailed Sandpiper, Black-winged Stilt, Red-capped Plover, Caspian Tern and Black-fronted Plover) and they were recorded in every season, including winter. The Ninox report does not present abundance data per season (only presence) but does present abundance per habitat attribute. The monitoring recorded very low shorebird numbers with a total of just 69 individuals recorded in 7 years of monitoring, with the highest habitat attribute aggregate abundance being 8 individuals (Red-capped Plover and Black-fronted Plover).

Throughout the year the paddocks and other disturbed habitats are utilised by a range of cosmopolitan bird species and in particular, those that respond positively to disturbance. These include Australian Raven, White-fronted Chat, Yellow-rumped Thornbill, Willie Wagtail, Tree Martin, Australian Pipit, Dusky Woodswallow and Emu which dominated the paddocks, and Red Wattlebird, Australian Ringneck, Australian Magpie at wetland and bushland boundaries, and which were commonly seen crossing paddocks between remnants.

Raptors were commonly observed hunting over the wetlands and surrounding paddocks. Of the 14 species recorded, the most commonly observed were Swamp Harrier, Brown Falcon, Australian Kestrel and Wedge-tailed Eagle, typically as single birds. Others, such as the Peregrine Falcon and Osprey were recorded only once. Ninox (2011) recorded very similar results with respect to raptors (and owls), with 14 species recorded in total including 3 significant species, Osprey, White-bellied Sea-Eagle and Peregrine Falcon. Swamp Harrier was also ubiquitous in the Ninox (2011) surveys, being recorded in every monitoring period, but being restricted to 'vegetated' habitats.

Frogs were far more active in the wetter autumn – spring months, being largely absent during the Basic survey, in December 2023 when the wetlands and woodland substrates were largely dry. All 8 species recorded in the current survey were also recorded by Ninox (2011).

In contrast to frogs, 3 of the 8 bat species recorded were more abundant in summer than the previous 3 seasons. This was most evident for Southern Forest Bat which is known to hibernate over the colder months (Churchill 2008). The seasonal variation in abundance of the other 5 bat species was not as pronounced. Ninox (2011) definitively recorded 5 bat species, including Western False Pipistrelle, and 2 unidentified species. One of the unidentified species was a Nyctophilus/long-eared bat that likely represents species recorded in the current survey (Lesser Long-eared Bat, Holt's Long-eared Bat and/or Greater Long-eared Bat).

6.2 SIGNIFICANT SPECIES

The 10 conservation significant fauna species recorded in the study area in the current survey and/or BBRAS (Phoenix 2025a) are discussed below:

- Western Ringtail Possum (*Pseudocheirus occidentalis;* CR)
- Baudin's Cockatoo (*Zanda baudinii;* EN)
- Carnaby's Cockatoo (*Zanda latirostris;* EN)
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso;* VU)
- Masked Owl (southwest) (*Tyto novaehollandiae novaehollandiae*; P4)
- Quenda (*Isoodon fusciventer*; P4)
- Western False Pipistrelle (*Falsistrellus mackenziei*; P4)
- Wood Sandpiper (*Tringa glareola*; Mig.)
- Osprey (*Pandion haliaetus*; Mig.)
- Peregrine Falcon (*Falco peregrinus*; OS).

The conservation significant species not recorded in the field but are likely to occur are discussed in Section 6.2.9.

6.2.1 Western Ringtail Possum (*Pseudocheirus occidentalis*)

The study area falls outside the Swan Coastal Plain management zone for the Western Ringtail Possum under the recovery plan for the species (DPaW 2017b). Habitat critical to survival in this management zone comprises long-unburnt mature remnant Peppermint woodlands with high canopy continuity and high nutrient foliage with minimal periods of summer moisture stress, and habitat connecting patches of remnants (DPaW 2017b). The recovery plan emphasises the importance of maintaining corridors between suitable habitats and refuge patches for safe dispersal across modified landscapes, specifically remnant Peppermint woodlands, and Jarrah and/or Marri forests and woodlands.

While Peppermint dominated woodlands are relatively widespread as remnants throughout the study area (i.e. Open woodland of Peppermint trees (degraded) habitat type), most are isolated (>25 m between patches) and highly degraded with no understorey. Accordingly, none of the Open woodland of Peppermint trees (degraded) habitat was considered of high-quality or moderate-quality for Western Ringtail Possum, and only about half of this habitat type (48 ha of 99 ha) was considered low-quality, with the remainder classified as having no habitat value (Table 5-14).

Instead, the Marri-Jarrah-Peppermint woodland habitat was found to be of importance to the species in the WFA and RIA, with all Western Ringtail Possum records (16 individuals) being from this habitat type and it being the only habitat type to receive high-quality or moderate-quality rating. Quality of the Marri-Jarrah-Peppermint woodland for Western Ringtail Possum was variable however, with only around 98 ha (2.5% of the study area) rated high-quality and 103 ha (2.6% of the study area rated moderate-quality, with the remaining 3,690.6 ha (95% of the study area) being low-quality habitat or of not habitat for the species (Table 5-14). High and moderate value habitat occurs typically in the larger remnants, those adjoining/near contiguous vegetation outside the study area and where there is close connectivity between patches (Figure 5-13).

Based on the field records of Western Ringtail Possum, occurrence in the WFA appears to be restricted to Marri-Jarrah-Peppermint woodland near its boundaries (Figure 5-4), where such habitat is contiguous with, or occurs in close proximity to, larger intact remnants outside the WFA. Similarly, the records from the RIA suggest the same, i.e. a direct connection to habitat with a much larger extent outside the study area, in this case the South Blackwood State Forest.

Many of the Marri-Jarrah-Peppermint woodland remnants further inside the WFA are too isolated (DCCEEW 2024c) for this arboreal species, preventing it from moving safely across the agricultural landscape that supports an abundant fox population.

Three of 4 instances of a female with juvenile were from the northern part of the WFA, and one was from the south-east corner. Female home ranges in Peppermint dominated woodland are generally less than 2 ha (DPaW 2017b), therefore the nests/dreys of the females are likely to occur within 150 m of the location of the records.

6.2.2 Black cockatoos (*Calyptorhynchus banksii naso*, *Zanda baudinii* and *Zanda latirostris*)

All 3 species of black cockatoo were observed while zoologists were on site throughout 2023 and summer 2024/2025 and the long-term audio recorders deployed in Phase 3 detected ~6 hours of foraging activity across the 6 sites investigated, over a 2-month period. Forest Red-tailed Black Cockatoo was directly observed most, followed by Carnaby's Cockatoo. All 3 species were most often observed moving about and over the study area, rather than actively using it, directly observing foraging was rare, indirectly foraging via chewed nuts was more common, mainly by Forest Red-tailed Black Cockatoo.

Conversely, the long-term audio recorders detected only 42 minutes of foraging by Forest Red-tailed Black Cockatoo, but 5.7 hours of foraging by 'white-tailed' cockatoos that could be either Carnaby's Cockatoo or Baudin's Cockatoo. Given Baudin's Cockatoo was directly observed much less frequently than Carnaby's Cockatoo, it is reasonable to assume the majority of that time can be attributed to the latter species. Conversely, Ninox (2011) did not record Carnaby's Cockatoo, and did record Baudin's Cockatoo and Forest Red-tailed Black Cockatoo, but in low numbers over 7 years of monitoring at the adjacent Beenup artificial wetlands.

No evidence to suggest any of the 3 species breed or roost in the study area was recorded during the surveys, which is not surprising given no known nesting trees and only 4 suitable nesting trees from 760 PNTs were recorded. This was confirmed via an exhaustive PNT assessment that investigated hundreds of hollows, evening night roosting assessments and long-term audio recorder deployment through summer and spring 2024/2025. The weight of evidence therefore strongly suggests that the primary contribution of the habitats of the study area to black cockatoos is in providing foraging resources.

The study area supports at least 23 plant species (Phoenix 2025b) known to be food resources for one or more black cockatoo species (Table 5-8). Given this and in consideration of known roosting sites being present within 15 km of the study area, the foraging habitat analysis using the Bamford (2021) scoring system found high-quality foraging habitat to be present in the study area for all species. As with Western Ringtail Possum, high-quality (foraging) habitat was restricted to Marri-Jarrah-Peppermint woodland habitat (Table 5-11 – Table 5-12). A greater extent of Marri-Jarrah-Peppermint woodland was rated high-quality for Forest Red-tailed Black Cockatoo because less is known of the species' food preferences, especially compared to Carnaby's Cockatoo, and therefore the descriptive elements of each score are broader (Appendix 5). Forest Red-tailed Black Cockatoo were also directly observed more frequently and more foraging evidence was attained.

The DAWE (2022) foraging habitat quality scoring system, which was also applied, is a more blunt framework than that of Bamford (2021), resulting in scores of either 0 (for habitat not used by the species) or 9/7 (for any habitat they will forage in), i.e. there is no difference between the high-quality Marri-Jarrah-Peppermint woodlands, which is the most important habitat for all 3 species, and the other foraging habitats, which is clearly incorrect biologically. The Bamford (2021) system and its resultant scores are therefore considered a more useful assessment tool as it requires that the individual food species composition and their respective cover values be considered in each habitat type.

The study area occurs right on the southern boundary of the JAF02 bioregion and as such there is extensive Jarrah Forest to the north and east, and expansive proteaceous shrublands and *Banksia* woodlands to the south-west in the Scott National Park, adjoining freehold land to the south and south-east, nearer the coast. Presence of these habitat values in the vicinity likely encourage black cockatoo flights across the study area (north-south and east-west), stopping to forage as needed, as they traverse from their forest roosting and breeding grounds to the north/north-east. As such it is considered that the WFA contains habitats that are unlikely to be critical (foraging, roosting or breeding) but rather provide supplementary foraging habitat for all 3 species.

6.2.3 Masked Owl (southwest) (*Tyto novaehollandiae novaehollandiae*)

The Masked Owl was originally detected outside the study area by an audio recorder placed opportunistically on the Scott River in May 2023 as part of the BBRAS (Phoenix 2025a). In response, the decision was made to actively record for the species at all bird-bat fixed observations sites for the remainder of that survey program (see Phoenix 2025a). It was subsequently detected once more via audio recording in November 2023 in the central RIA. Both records are from densely forested habitats, outside the WFA, on the periphery of paddocks.

Until very recently the state of Masked Owls in the Margaret River area was poorly understood, and that remains the case for much of the Southwest region. However, extensive survey effort in the Margaret River area by Dr Boyd Wykes (lead ornithologist for Phoenix 2024b) has started to document a healthy population between Cape Naturaliste and Cape Leeuwin extending east towards Manjimup, particularly along the Blackwood Valley. Detecting the species in riverine forest of the Scott River area was therefore anticipated.

Masked Owls are most detectable in autumn when they are preparing to breed and are thus actively pair-bonding and advertising their territories using their unique screech vocalisations. While breeding and roosting typically takes place in forest habitats where there are ancient trees with suitable large hollows (mainly Karri and Marri), they have also been recorded roosting in plantations (Boyd Wykes pers. comm.). They are a perch and drop hunter primarily on the edges of open paddocks and forest. Due to a lack of large hollows recorded it is concluded therefore that the species is unlikely to breed within the WFA and, if it forages in the WFA while it has not been detected to date, it is likely to be restricted to the edges of woodland remnants.

6.2.4 Quenda (*Isoodon fusciventer*)

The record of Quenda immediately north and south of Governor Broome Road in the survey (and nearby desktop records) is not surprising given the presence of suitable habitats with scrubby vegetation, i.e. the Seasonally inundated shrublands, woodlands and sedgelands, along with Marri-Jarrah-Peppermint woodland. These collectively cover 700 ha of the study area, though the wetland habitats may vary in suitability seasonally and smaller remnants may not be utilised.

Higher-quality (larger intact remnant) habitats are available in the excised remnants internal of the WFA, and to the south-west, east, and north of the study area. Quenda are most likely to utilise habitat recorded along the boundary of the WFA which lie adjacent to large remnant habitat areas surrounding the WFA, while the smaller isolated remnants within the WFA are unlikely to provide critical habitat for Quenda locally, given their disconnected/isolated nature. Rather, Quenda are likely opportunistically utilising the resources available within the WFA or by males seeking new territory. Their presence is also likely to be heavily controlled by the large fox population of the area generally. The high-quality and abundant habitats surrounding the study area are more likely to provide critical habitat to the local Quenda population.

6.2.5 Western False Pipistrelle (*Falsistrellus mackenziei*)

Western False Pipistrelle was not previously known from the study area, with the closest record being 14 km to the north-east. The extensive echolocation recordings undertaken for the bird-bat risk assessment (Phoenix 2025a) detected the species from 7 locations in autumn, spring and summer sampling, albeit in low numbers and which included open paddocks.

These observations are at odds with current research which suggests the species is strongly associated with mature or even old-growth forest where nesting and roosting hollows are more plentiful (Churchill 2008). Therefore, recording it across the study area (although at a very low detection rate) was unexpected.

The PNT assessment recorded 155 trees with 189 hollows in total, many of which would be considered suitably sized to support the species; these were nearly entirely within Marri-Jarrah-Peppermint woodland habitat. As discussed for Western Ringtail Possum above, the best examples of this habitat occur at the periphery of the WFA, thus it is expected that support for breeding and roosting is restricted mainly to the northern boundary and patches in the south-east, north of Governor Broome Road. As mentioned for other species, the study area is bounded to the north, east and west by high-quality forest protected within National Park and Nature Reserve.

6.2.6 Wood Sandpiper (*Tringa glareola*)

Wood Sandpiper was observed once in December 2023, as a group of 3 birds. It was the only Migratory species recorded during the surveys completed between May 2023 and January 2024, and including the BBRAS (Phoenix 2025a).

Wood Sandpipers are commonly seen throughout coastal and inland areas of Australia (ALA 2024); however, unlike many Migratory shorebirds, Wood Sandpiper typically shuns coastal mudflats, instead foraging in shallow, freshwater wetlands, usually where there is grass or aquatic plants protruding above the water, and often with trees and fallen timber. These attributes are common in the wetlands of the WFA, e.g. most are shallow with areas of introduced grass as well as dense stands of sedges or shrubs, many have open water and aquatic plants. Paperbark trees were isolated or occasional in Seasonally inundated sedgelands and shrublands but dominated the Seasonally inundated paperbark woodland habitat.

The species is generally observed in small flocks or singly, often with other waders. They leave their breeding areas by early September and are mostly seen in Australia between August and April. Small numbers of birds may remain in Australia over winter (Birdlife Australia 2024b); no overwintering individuals were recorded in the study area. The desktop review found only a single record, from the Beenup artificial wetlands adjacent the study area, but the record is not associated with the waterbird monitoring of Ninox (2011).

The East Asian-Australian Flyway population estimate for Wood Sandpiper is 130,000 birds (Hansen *et al.* 2016). However, as noted repeatedly in Hansen *et al.* (2016) estimating population sizes for inland wetland species is much harder than for coastal species foraging on open mudflats, which is the more typical foraging habitat of species migrating to Australia. Nonetheless, as per DoEE (2017), 3 individuals recorded precludes the study area from being considered Internationally or Nationally significant habitat, which would require 1,300 or 130 birds to be observed, respectively.

6.2.7 Osprey (*Pandion haliaetus*)

The Osprey has been commonly recorded in the region, but generally in proximity of the Hardy Inlet and Blackwood River (Figure 5-1), where according to the compiled desktop dataset it has been recorded at least 125 times. The only other records beyond this regionally important river are 2.3 km south of the study area, and just once at the Beenup artificial wetlands by Ninox (2011), in 12

monitoring events over 7 years. It was recorded in the study area once, by the heritage survey for the Project, and not in any of the fauna surveys. Given the rarity of records locally and beyond the Hardy Inlet more generally, the study area is considered minor/supplemental foraging habitat, within the home range of Hardy Inlet/Blackwood River individuals, and breeding is unlikely to occur.

6.2.8 Peregrine Falcon (*Falco peregrinus*)

The single record of Peregrine Falcon hunting around Governor Broome Road, along with desktop records at the Beenup artificial wetlands (4 records over a number of years) and 4 km west, indicate the study area is part of the territory of a resident bird/s. The habitats of the study area provide ample hunting grounds for the species, with a variety of small birds available as prey within/above the farm-habitat mosaic of open paddocks, dams, plantations, woodlands and wetlands.

The most common natural structures Peregrine Falcons use for nesting (rocky cliff edges, steep escarpments, gorge walls and rocky outcrops) are not present in the study area. However, they have been recorded nesting on utility towers, like the tall electrical towers in the Western Power corridor. These towers were inspected and only an Australian Raven nest was observed throughout the survey period. The study area therefore does not contain 'natural' breeding/nesting habitat and is considered foraging habitat within a resident bird's home range.

6.2.9 Likely to occur significant species

The likelihood of occurrence assessment (see section 5.2.5) found that of the conservation significant species identified in the desktop but not recorded in the field, 4 species were considered likely to occur in the study area:

- Short-nosed Snake (*Elapognathus minor*; P2) –close (3.2 km) record south-east of the study area and the wetland habitats especially are suitable habitat; the species prefers swamps, marshes, and seasonally inundated areas with dense vegetation (such as sedges, reeds, and rushes) in low-lying heathlands and moorlands), on sandy or peaty soils where it can burrow and seek shelter.
- Blue-billed Duck (*Oxyura australis*; P4) – considered likely to occur on occasion due to presence of suitable habitat and very close (<1 km) desktop records from the Beenup artificial wetlands (Ninox 2011). Likely to utilise the larger lakes in Seasonally inundated sedgeland (wetland).
- Common Greenshank (*Tringa nebularia*; Mig.) – many desktop records (>90) in proximity to the study area (principally associated with the Blackwood River, Scott River and the artificial wetlands to the west), suitable habitat present (forages in coastal wetlands, lakes and swamps) and arrives in Southwest as early as August. Commonly recorded along the Southwest coast and inland wetlands. Early arrivals may be observed from late August, with the majority arriving in September, and presence becoming widespread by October. Likely to occur in September and October when some of the wetlands are still inundated and may also utilise inundated paddocks.
- South-western Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*; CD) – likely to occur due to nearby recent (<10 km) desktop record, presence of suitable habitat (key habitat in the Southwest includes dry sclerophyll forests and open woodlands containing hollow-bearing trees) and proximity to large tracts of conservation reserve. Most likely to utilise the large woodland - wetland mosaic remnant on the northern boundary of the WFA, where it is close to other remnants that may act as linkages to the conservation reserves to the north.

A further 14 and 13 species were considered to possibly and possibly (rarely) occur, respectively, based on the currency of records and suitability of habitat present in the study area (Table 5-15).

6.3 ECOLOGICAL LINKAGE VALUES

The study area occurs at the junction of 3 SWREL ecological linkages, 2 of which partially intersect the study area (section 3.7; Figure 3-5). The east-west linkage at the northern end of the WFA (Figure 3-5) runs through the large woodland - wetland mosaic remnant on the northern boundary of the WFA. This remnant, along with another large remnant immediately adjacent the study area to the west, likely provide important stepping stones for movement of fauna between the extensive intact habitat of Pagett Nature Reserve/South Blackwood State Forest in the east and Scott National Park in the west. This remnant, which supports black cockatoo foraging and Western Ringtail Possum breeding is therefore considered significant as supporting a regional ecological linkage.

The single north-south linkage that runs along the eastern boundary of the WFA intersects it at the northern extent along Dennis Road (Figure 3-5). While the linkage is situated mainly outside the study area boundary, the woodland and wetland habitat remnants on the eastern side of the study area (mainly south of the Bluegum plantation) may support some movement of fauna, thus making a minor contribution to this linkage. However, significance of these remnants to this linkage is less clear than for the northern east-west linkage, due to the small size, isolation and variable conditions of the remnants present in that area.

The third linkage runs east-west just south of the WFA boundary within continuous habitat cover associated with the Scott River (Figure 3-5); it is intersected by the north-south linkage to the east of the study area. The habitat remnants in the south of the study area that are contiguous with, or near to, the Scott River are typically small, isolated and degraded (but a few better examples are present, such as at the intersections of Scott River Road-Governor Broome Road, Dennis Road-Governor Broome Road) and likely may partially support this third linkage.

Key vertebrate groups likely to depend on the linkages for movement, either foraging or dispersal are mobile, small-moderate sized bush birds, small native mammals and reptiles, and specifically, black cockatoos, Western Ringtail Possum and Quenda with respect to significant fauna recorded.

6.4 CONCLUSION

The study area comprises mostly cleared areas interspersed with native wetland and woodland habitat remnants of varying size, condition and contribution to fauna values. The larger habitat patches are typically better quality and of higher value for vertebrate fauna than the smaller, more isolated remnants. Key habitat values in the study area mainly relate to significant species such as the 3 Threatened black cockatoo species and Western Ringtail Possum, with one main habitat Marri-Jarrah-Peppermint woodland providing the highest value to these species. Even these values are relatively low compared with those likely to be present in the expansive, intact conservation reserves immediately north-east and south-west of the study area.

Observed use of the study area by black cockatoos was limited to foraging, with no evidence of breeding or night roosting recorded. Foraging habitat in the study area probably represents supplementary resources to the abundant habitats adjacent to the study area.

Use of the WFA by Western Ringtail Possum appeared to be restricted to Marri-Jarrah-Peppermint woodland near its boundaries, where such habitat is contiguous with, or occurs near, larger intact remnants outside the WFA.

The value of the wetlands in the study area to Migratory shorebirds is low relative to the higher value shorebird habitat elsewhere in the region, such as at the Hardy Inlet. Most wetland habitats in the study area are only of foraging value to Migratory shorebirds in spring and early summer, between their arrival in the Southwest and the drying out of most of the wetlands.

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Appendix 1 Survey site locations

Site	Latitude	Longitude
AQU-01	-34.247482	115.271328
AQU-02	-34.248689	115.276135
AQU-03	-34.249464	115.279433
AQU-04	-34.249808	115.281943
AQU-05	-34.210338	115.321636
AQU-06	-34.251412	115.303417
AQU-07	-34.24681	115.305785
AQU-08	-34.205434	115.276028
AQU-09	-34.244135	115.273808
AQU-10	-34.241789	115.274589
AQU-11	-34.245805	115.314653
AQU-12	-34.244781	115.308837
AQU-13	-34.246574	115.309238
AQU-14	-34.181586	115.27887
AQU-15	-34.180514	115.280501
AQU-16	-34.183749	115.284309
AQU-17	-34.179513	115.288093
AQU-18	-34.185171	115.276625
AQU-19	-34.190734	115.278902
AQU-20	-34.199881	115.269676
AQU-21	-34.193204	115.268229
AQU-22	-34.229937	115.272246
AQU-23	-34.245113	115.310428
AQU-24	-34.242576	115.304795
AQU-25	-34.174843	115.282793
AQU-26	-34.237156	115.296574
AQU-27	-34.237546	115.311216
AQU-28	-34.234948	115.312542
AQU-29	-34.234925	115.312569
AQU-30	-34.232315	115.307734
AQU-31	-34.232194	115.313117
AQU-32	-34.211393	115.280677
AQU-33	-34.218751	115.281792
AQU-34	-34.210126	115.284739
AQU-35	-34.211817	115.288561
AQU-36	-34.208199	115.292099
AQU-37	-34.220606	115.298343
AQU-38	-34.260164	115.300419
AQU-39	-34.257787	115.298181
AQU-40	-34.256061	115.302074
AQU-41	-34.215397	115.290838
AQU-42	-34.217194	115.286282
AQU-43	-34.217226	115.289498
AQU-44	-34.228251	115.296158

Site	Latitude	Longitude
AQU-45	-34.231149	115.299469
AQU-46	-34.235068	115.305809
AQU-47	-34.2301	115.303493
AQU-48	-34.229863	115.310481
AQU-49	-34.227313	115.312516
AQU-50	-34.227574	115.304967
AQU-51	-34.225103	115.30517
AQU-52	-34.224393	115.301195
AQU-53	-34.226724	115.300412
AQU-54	-34.20575	115.314201
AQU-55	-34.206957	115.300623
AQU-56	-34.201059	115.295523
AQU-57	-34.198439	115.29352
AQU-58	-34.219785	115.308102
AQU-59	-34.218696	115.307423
AQU-60	-34.206534	115.31591
AQU-61	-34.20672	115.311975
AQU-62	-34.212032	115.298321
AQU-Opp01	-34.222283	115.299462
AQU-Opp02	-34.233752	115.269336
AQU-Opp03	-34.195279	115.292389
AQU-Opp04	-34.238697	115.269518
BC Roosting 18	-34.224332	115.320894
BC2024_01	-34.199253	115.314846
BCForaging	-34.199442	115.311924
BCRoosting01	-34.192577	115.277687
BCRoosting03	-34.198479	115.30151
BCRoosting04	-34.224194	115.306812
BCRoosting05	-34.24021	115.313766
BCRoosting06	-34.250175	115.280087
BCRoosting07	-34.198186	115.315568
BCRoosting09	-34.24775	115.315593
BCRoosting10	-34.173825	115.290991
BCRoosting11	-34.176611	115.294864
BCRoosting12	-34.237906	115.323072
BCRoosting13	-34.24428	115.323264
BCRoosting14	-34.261857	115.29435
BCRoosting15	-34.174604	115.274135
BCRoosting16	-34.19273	115.321675
BCRoosting17	-34.256463	115.301149
Bfalcon	-34.240213	115.293611
Birding01	-34.197116	115.307535
Birding02	-34.228454	115.30931
Birding03	-34.242562	115.320686

Site	Latitude	Longitude
Black Cockatoos	-34.259281	115.267938
CarnabysCockies02	-34.160129	115.313343
Cat2024_01	-34.249886	115.283611
Drey01	-34.24573	115.320908
Dugite02	-34.185929	115.286062
Fox2024_01	-34.245848	115.320142
Fox2024_02	-34.19998	115.315116
Fox2024_03	-34.249569	115.272026
Fox2024_04	-34.245716	115.313908
FRTBC-01	-34.237853	115.322438
FRTBC-02	-34.249158	115.284346
FRTBC-03	-34.19941	115.31187
FRTBC-04	-34.260883	115.270208
FRTBC-05	-34.187524	115.274718
FRTBC-06	-34.184362	115.282472
Goanna01	-34.250683	115.269393
KingSkink01	-34.251079	115.277141
Mowl01	-34.259673	115.270071
Opp01	-34.21009	115.284195
Opp02	-34.20948	115.281391
Opp03	-34.257498	115.298576
Opp05	-34.214073	115.290011
Opp06	-34.21658	115.269288
Opp07	-34.213811	115.26955
Opp08	-34.239714	115.294114
Opp09	-34.249946	115.290238
Opp10	-34.208905	115.278547
Opp11	-34.234284	115.281151
Opp12	-34.200064	115.31186
Opp13	-34.187483	115.321007
Opp14	-34.160229	115.312543
Opp15	-34.193784	115.322088
Opp17	-34.209966	115.281969
Opp18	-34.270554	115.271178
Opp19	-34.177184	115.280408
Opp21	-34.253592	115.277606
Opp22	-34.249947	115.276697
Opp23	-34.209581	115.278315
Osprey	-34.243811	115.281009
Quenda01	-34.251458	115.277907
Quenda02	-34.251695	115.27534
Raven01	-34.237716	115.322554
Shingleback01	-34.216754	115.295742
SM4-01	-34.199801	115.314268
SM4-02	-34.19959	115.311994
SM4-03 (failed)	-34.23748	115.320312

Site	Latitude	Longitude
SM4-04	-34.245543	115.321471
SM4-05	-34.251034	115.282892
SM4-06	-34.191929	115.273207
SM4-07	-34.192035	115.269482
Tawny01	-34.237682	115.322316
TigerSnake01	-34.250872	115.302703
VER-01	-34.174142	115.273032
VER-02	-34.192763	115.267878
VER-03	-34.196448	115.267111
VER-04	-34.24615	115.321561
VER-05	-34.200165	115.312108
VER-06	-34.197436	115.289356
VER-07	-34.197868	115.295623
VER-08	-34.197474	115.294637
VER-09	-34.200199	115.294946
VER-10	-34.210046	115.30347
VER-11	-34.220795	115.297671
VER-12	-34.207463	115.315493
VER-13	-34.237608	115.320145
VER-14	-34.23446	115.28499
VER-15	-34.237397	115.296469
VER-16	-34.239866	115.306381
VER-17	-34.260188	115.269656
VER-18	-34.206358	115.321713
VER-19	-34.22857	115.322834
VER-20	-34.240189	115.323754
VER-21	-34.251811	115.283041
VER-22	-34.250516	115.269781
VER-23	-34.245524	115.269662
VER-24	-34.239467	115.269539
VER-25	-34.236058	115.269151
VER-26	-34.233795	115.269163
VER-27	-34.229022	115.269025
VER-28	-34.225355	115.268869
VER-29	-34.183902	115.270066
VER-30	-34.159844	115.278315
VER-31	-34.161288	115.312818
VER-32	-34.15691	115.401718
VER-33	-34.229605	115.302845
VER-34	-34.247248	115.305696
VER-35	-34.230832	115.297507
VER-36	-34.217031	115.288597
VER-37	-34.210259	115.28399
VER-38	-34.251138	115.303766
VER-39	-34.25625	115.30209
VER-40	-34.275721	115.305096

Site	Latitude	Longitude
VER-41	-34.275564	115.292249
VER-42	-34.276938	115.302097
VER-43	-34.218715	115.309859
VER-44	-34.200739	115.267108
VER-45	-34.175399	115.283843
VER-46	-34.17434	115.280321
VER-47	-34.178331	115.289973
VER-48	-34.176532	115.294445
VER-49	-34.183202	115.28484
VER-Opp01	-34.245723	115.32289
VER-Opp02	-34.215468	115.294549
VER-Opp03	-34.21245	115.295645
VER-Opp04	-34.159037	115.278097
VER-Opp05	-34.250311	115.298814
VER-Opp06	-34.259541	115.29166
VER-Opp07	-34.17434	115.280321
VER-Opp08	-34.173919	115.293257

Site	Latitude	Longitude
VER-Opp09	-34.250525	115.272565
WedgeyOpp	-34.172799	115.274289
Wetland01	-34.251319	115.303338
Wetland02	-34.256765	115.30225
Wetland03	-34.18034	115.281604
White-tail_Foraging	-34.184758	115.281894
WRP01	-34.175554	115.293327
WRPTrans01	-34.192522	115.269225
WRPTrans02	-34.183529	115.279169
WRPTrans03	-34.17627	115.279641
WRPTrans04	-34.245207	115.32162
WRPTrans05	-34.255915	115.269368
WRPTrans06	-34.191537	115.269395
WRPTrans07	-34.184343	115.281709
WRPTrans08	-34.174352	115.280063
WRPTrans09	-34.237868	115.321003
WRPTrans10	-34.255566	115.270273

Appendix 2 Terrestrial fauna survey site descriptions

Site details			
Site	**AQU-01**	**Position (WGS84)**	115.2713, -34.2475
Slope	negligible	**Topography**	depression
Soil colour	brown	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023
1	Foraging - vertebrates	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Seasonally inundated paperbark woodland, (degraded). Altered vegetation structure through grazing, and substrate physically altered by machinery.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, livestock tracks, large-scale clearing		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	131	**Litter distribution**	under vegetation
Tree cover (%)	1	**Litter depth (cm)**	1.0
Shrub cover (%)	10	**Litter cover (%)**	1
Grass cover (%)	90	**Herb cover (%)**	30

Site details			
Site	**AQU-02**	**Position (WGS84)**	115.2761, -34.2487
Slope	negligible	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023
1	Foraging - vertebrates	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Small sumpland, highly degraded, small patch of dead shrubs still standing. Very shallow water, patchily distributed throughout the grass.			
Habitat	Cleared - degraded sumpland		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	107	**Litter distribution**	none
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	2	**Litter cover (%)**	1
Grass cover (%)	95	**Herb cover (%)**	5

Site details			
Site	**AQU-03**	**Position (WGS84)**	115.2794, -34.2495
Slope	negligible	**Topography**	undulating plain
Soil colour	black, brown	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023
1	Foraging - vertebrates	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Sumpland consisting of sparse Melaleuca, Acacia and sedges over paddock grass. Inundation partially artificial due to adjacent road.			
Habitat	Dam		
Disturbance	current operations, grazing-low, historic clearing, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	140	**Litter distribution**	under vegetation
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	1
Grass cover (%)	80	**Herb cover (%)**	0

Site details			
Site	**AQU-04**	**Position (WGS84)**	115.2819, -34.2498
Slope	negligible	**Topography**	undulating plain
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023
1	Foraging - vertebrates	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Highly degraded sumpland. Tall dead trees over isolated Melaleuca and Acacia ssp. over sedges and weeds. Some puddles of shallow open water, but mostly inundated grassland.			
Habitat	Cleared - degraded sumpland		
Disturbance	current operations, evidence of feral animals, grazing-high, large-scale clearing, livestock tracks, litter, weed infestation, vehicle tracks		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	130	**Litter distribution**	under vegetation
Tree cover (%)	10	**Litter depth (cm)**	1.0
Shrub cover (%)	30	**Litter cover (%)**	1
Grass cover (%)	80	**Herb cover (%)**	10

Site details			
Site	**AQU-05**	**Position (WGS84)**	115.3216, -34.2103
Slope	negligible	**Topography**	depression
Soil colour	red-brown	**Soil texture**	clay loam, laterite
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	31 Aug 2023	31 Aug 2023
1	Foraging - vertebrates	31 Aug 2023	31 Aug 2023

Site description - visit 1 (31 Aug 2023)			
Artificial sumpland (dam) within Bluegum plantation. No vegetation besides occasional sedges and herbs continuous up to the water edge. Various waterbirds regularly seen on water's surface.			
Habitat	Cleared - degraded sumpland		
Disturbance	current operations		
Vegetation condition	Completely Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	75	**Litter distribution**	concentrated in drifts
Tree cover (%)	60	**Litter depth (cm)**	3.0
Shrub cover (%)	5	**Litter cover (%)**	40
Grass cover (%)	0	**Herb cover (%)**	10

Site details			
Site	**AQU-06**	**Position (WGS84)**	115.3034, -34.2514
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, peat, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023
1	Foraging - vertebrates	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Seasonally inundated Paperbark woodland, with extensive open water, largely covered on duckweed. Grass and herbs on dry areas, but few shrubs present. Banjo frogs calling and several birds present. Isolated in the middle of a paddock.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, livestock tracks, large-scale clearing, litter		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	165	**Litter distribution**	under vegetation
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	5	**Litter cover (%)**	1
Grass cover (%)	80	**Herb cover (%)**	60

Site details			
Site	**AQU-07**	**Position (WGS84)**	115.3058, -34.2468
Slope	negligible	**Topography**	floodplain
Soil colour	brown, black	**Soil texture**	clay loam, loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023
1	Foraging - vertebrates	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Very good condition seasonally inundated Paperbark wetland. Paperbarks in the centre with sedges and isolated grass trees at the periphery. Aquatic plants present as well as a number of frog and breeding waterbird species. Same remnant as site VER-34.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, vehicle tracks, livestock tracks, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	180	**Litter distribution**	under vegetation
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	10	**Litter cover (%)**	1
Grass cover (%)	90	**Herb cover (%)**	60

Site details			
Site	**AQU-08**	**Position (WGS84)**	115.2760, -34.2054
Slope	negligible	**Topography**	seasonally wet area
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Seasonally inundated Paperbark wetland. Vegetation comprised of Paperbark low trees over tall shrubs, over sedges and introduced grasses. Aquatic plants present and duckweed covering at least half the surface of the open water. Four frog species present and several bush birds.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, evidence of feral animals, grazing-low, large-scale clearing, livestock tracks, litter, vehicle tracks, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	105	**Litter distribution**	sparse
Tree cover (%)	30	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	1
Grass cover (%)	25	**Herb cover (%)**	10

Site details			
Site	**AQU-09**	**Position (WGS84)**	115.2738, -34.2441
Slope	negligible	**Topography**	seasonally wet area
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Seasonally inundated Paperbark wetland. Vegetation consists of Melaleuca (Paperbark) over sedges and ferns, and occasional grass trees. High-quality vegetation surrounding wetland.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, evidence of feral animals, grazing-low, large-scale clearing, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	155	**Litter distribution**	under vegetation
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	15	**Litter cover (%)**	1
Grass cover (%)	80	**Herb cover (%)**	40

Site details			
Site	**AQU-10**	**Position (WGS84)**	115.2746, -34.2418
Slope	negligible	**Topography**	seasonally wet area
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Degraded sumpland. Little to no vegetation remaining.			
Habitat	Dam		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, vehicle tracks		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	152	**Litter distribution**	none
Tree cover (%)	2	**Litter depth (cm)**	1.0
Shrub cover (%)	5	**Litter cover (%)**	1
Grass cover (%)	95	**Herb cover (%)**	50

Site details			
Site	**AQU-11**	**Position (WGS84)**	115.3147, -34.2458
Slope	negligible	**Topography**	seasonally wet area
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Seasonally inundated wetland. Excellent condition sedgeland with vegetation structurally intact. Eucalypts and Banksia over Melaleuca (Paperbark) over sedges and grasses. Multiple frog species present, but no waterbirds present at the time of survey. Little open water.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	current operations, grazing-low, livestock tracks, large-scale clearing, litter, weed infestation, vehicle tracks		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	180	**Litter distribution**	none
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	1
Grass cover (%)	70	**Herb cover (%)**	50

Site details			
Site	**AQU-12**	**Position (WGS84)**	115.3088, -34.2448
Slope	negligible	**Topography**	seasonally wet area
Soil colour	black, brown	**Soil texture**	clay loam and laterite, sandy loam
Rock cover (%)	20	**Rock type**	laterite

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Seasonally inundated wetland. High-quality shallow water sedgeland. Waterbody surrounded by peppermint trees over Melaleuca (Paperbark), over sedge ssp. Surrounded by paddocks. No water birds present but multiple frogs calling.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, vehicle tracks, weed infestation, firebreak		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	190	**Litter distribution**	under vegetation
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	30	**Litter cover (%)**	1
Grass cover (%)	80	**Herb cover (%)**	60

Site details			
Site	**AQU-13**	**Position (WGS84)**	115.3092, -34.2466
Slope	negligible	**Topography**	depression
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	2	**Rock type**	granite - outcropping

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Seasonally inundated wetland. Severely grazed sedgeland consisting of low Melaleuca shrubs (0.5 m in height), over sedge ssp. and aquatic plants. Ticking Frogs abundant but no waterbirds present.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	grazing-low, large-scale clearing, current operations, livestock tracks, weed infestation		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	160	**Litter distribution**	none
Tree cover (%)	30	**Litter depth (cm)**	1.0
Shrub cover (%)	30	**Litter cover (%)**	1
Grass cover (%)	60	**Herb cover (%)**	40

Site details			
Site	**AQU-14**	**Position (WGS84)**	115.2789, -34.1816
Slope	gentle	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	clay loam, loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Narrow seasonally inundated Paperbark wetland. Sedges at the water boundaries and in open areas and denser Melaleuca (Paperbark) woodland towards the centre, surrounded by paddocks. Water up to 0.5m deep. Six bird species including White-faced Heron and 2 frog species present. Obvious signs of cattle grazing.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, livestock tracks, vehicle tracks, historic clearing		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	190	**Litter distribution**	none
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	15	**Litter cover (%)**	1
Grass cover (%)	90	**Herb cover (%)**	80

Site details			
Site	**AQU-15**	**Position (WGS84)**	115.2805, -34.1805
Slope	gentle	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	clay loam, loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023
1	Foraging - vertebrates	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Seasonally inundated wetland. Very degraded in parts due to cattle grazing, resulting in lost structure and only sedges persisting. The remainder of vegetation in excellent condition comprising areas of Paperbark woodland and sedge ssp. in and around waterbody. See also site Wetland03 located to the east.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	grazing-low		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	190	**Litter distribution**	none
Tree cover (%)	10	**Litter depth (cm)**	1.0
Shrub cover (%)	30	**Litter cover (%)**	1
Grass cover (%)	80	**Herb cover (%)**	70

Site details			
Site	**AQU-16**	**Position (WGS84)**	115.2843, -34.1837
Slope	gentle	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	clay loam, loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Long system of disjunct seasonally inundated Paperbark wetlands (sumpland). Dense stands of sedges at boundaries and between wetlands with dense Melaleuca (Paperbarks) towards the centre.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	grazing-low, large-scale clearing, livestock tracks, vehicle tracks		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	165	**Litter distribution**	none
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	30	**Litter cover (%)**	1
Grass cover (%)	70	**Herb cover (%)**	60

Site details			
Site	**AQU-17**	**Position (WGS84)**	115.2881, -34.1795
Slope	negligible	**Topography**	seasonally wet area
Soil colour	brown	**Soil texture**	clay loam, loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023
1	Foraging - vertebrates	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Seasonally inundated wetland consisting of dense stands of sedge with some areas of open of water. Some patches of Melaleuca (Paperbark). Two frogs and 3 bird species present. Site was burnt-off in Spring 2024 by owner.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	vehicle tracks, livestock tracks, grazing-low		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	95	**Litter distribution**	none
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	1
Grass cover (%)	50	**Herb cover (%)**	0

Site details			
Site	**AQU-18**	**Position (WGS84)**	115.2766, -34.1852
Slope	negligible	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	clay loam, loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023
1	Foraging - vertebrates	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Sumpland highly degraded with only sparsely distributed sedges left. A few stands of Melaleuca shrubs remaining.			
Habitat	Cleared - degraded sumpland		
Disturbance	current operations, grazing-low, vehicle tracks, livestock tracks		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	180	**Litter distribution**	none
Tree cover (%)	0	**Litter depth (cm)**	1.0
Shrub cover (%)	5	**Litter cover (%)**	1
Grass cover (%)	95	**Herb cover (%)**	80

Site details			
Site	**AQU-19**	**Position (WGS84)**	115.2789, -34.1907
Slope	negligible	**Topography**	undulating plain
Soil colour	brown, black	**Soil texture**	clay loam, loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023
1	Foraging - vertebrates	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Seasonally inundated wetland. Small sumpland with up to 1m of water and a 50/50 mix of sedge ssp. and Melaleuca shrubs. Surrounded by paddocks, being accessed by cattle. Two frog species present, but no waterbirds. Some open water.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	grazing-low, historic clearing, livestock tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	161	**Litter distribution**	none
Tree cover (%)	1	**Litter depth (cm)**	1.0
Shrub cover (%)	20	**Litter cover (%)**	1
Grass cover (%)	80	**Herb cover (%)**	60

Site details			
Site	**AQU-20**	**Position (WGS84)**	115.2697, -34.1999
Slope	negligible	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	clay loam, loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Excellent condition lake, seasonally inundated. Vegetation is mixed Acacia tall shrubs, tea tree and occasional Banksia, over Melaleuca shrubs, over mixed shrubs and sedges, over grasses and herbs. Surrounded by good terrestrial vegetation. A Musk Duck and Little Pied Cormorant using the lake.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	litter, vehicle tracks, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	60	**Litter distribution**	under vegetation
Tree cover (%)	10	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	1
Grass cover (%)	5	**Herb cover (%)**	5

Site details			
Site	**AQU-21**	**Position (WGS84)**	115.2682, -34.1932
Slope	negligible	**Topography**	depression
Soil colour	brown, black	**Soil texture**	clay loam, loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023
1	Foraging - vertebrates	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Small dampland, seasonally inundated. Shrubland, over sedge spp. No water present at time or survey but lots of Mosquitos suggest damp soils. Grevillea, Banksia and Persoonia at margins.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	litter, evidence of feral animals		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	95	**Litter distribution**	sparse
Tree cover (%)	15	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	5
Grass cover (%)	30	**Herb cover (%)**	10

Site details			
Site	**AQU-22**	**Position (WGS84)**	115.2722, -34.2299
Slope	negligible	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	clay loam, sandy clay, loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)			
Mostly degraded sumpland, but with small patches of good quality vegetation, not being accessed by cattle.			
Habitat	Cleared - degraded sumpland		
Disturbance	weed infestation, livestock tracks, grazing-low, current operations		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	125	**Litter distribution**	under vegetation
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	20	**Litter cover (%)**	1
Grass cover (%)	80	**Herb cover (%)**	20

Site details			
Site	**AQU-23**	**Position (WGS84)**	115.3104, -34.2451
Slope	negligible	**Topography**	depression
Soil colour	brown, black	**Soil texture**	clay loam, sandy loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Seasonally inundated sedgeland (sumpland). Vegetation severely grazed. Vegetation mostly less than 0.5m. Remaining native vegetation consists of Melaleuca tall shrubs, over sedges, over aquatic plants. Ticking Frogs abundant but no waterbirds observed.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	current operations, grazing-low		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	190	**Litter distribution**	none
Tree cover (%)	10	**Litter depth (cm)**	1.0
Shrub cover (%)	20	**Litter cover (%)**	1
Grass cover (%)	90	**Herb cover (%)**	70

Site details			
Site	**AQU-24**	**Position (WGS84)**	115.3048, -34.2426
Slope	negligible	**Topography**	seasonally wet area
Soil colour	brown, black	**Soil texture**	clay loam, sandy loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Seasonally inundated shrubland. Vegetation structure dense in core and largely intact. Grasses beyond, inside the fence line. Vegetation consists of Melaleuca and Acacia mid shrubs, over sedges and grasses. Surface water extent limited. Frogs present, no waterbirds.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	current operations, historic clearing, grazing-low, livestock tracks, vehicle tracks		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	160	**Litter distribution**	under vegetation
Tree cover (%)	10	**Litter depth (cm)**	1.0
Shrub cover (%)	50	**Litter cover (%)**	1
Grass cover (%)	60	**Herb cover (%)**	40

Site details			
Site	**AQU-25**	**Position (WGS84)**	115.2828, -34.1748
Slope	negligible	**Topography**	drainage line
Soil colour	black, grey	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	31 Aug 2023	31 Aug 2023
1	Foraging - vertebrates	31 Aug 2023	31 Aug 2023

Site description - visit 1 (31 Aug 2023)			
Seasonally inundated shrubland. Longitudinal sumpland surrounded by remnant vegetation. Vegetation consists of occasional Melaleuca (Paperbark) trees, over mixed shrubs and sedges. Site was burnt-off in Spring 2024 by owner. See also site VER-45.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	grazing-low, firebreak, current operations, vehicle tracks, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	60	**Litter distribution**	concentrated in drifts
Tree cover (%)	30	**Litter depth (cm)**	3.0
Shrub cover (%)	20	**Litter cover (%)**	40
Grass cover (%)	5	**Herb cover (%)**	5

Site details			
Site	**AQU-26**	**Position (WGS84)**	115.2966, -34.2372
Slope	negligible	**Topography**	seasonally wet area
Soil colour	brown, black	**Soil texture**	clay loam, sandy loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Seasonally inundated shrubland. Vegetation structure largely intact. Water mostly shallow puddles forming in low points between vegetation. Vegetation consists of Melaleuca over Acacia over sedges. Ticking Frogs present, no waterbirds. Area is legally protected (R 42377). Same remnant as AQU-27 and VER-15.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	current operations, grazing-low, firebreak, large-scale clearing, historic clearing, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	155	**Litter distribution**	under vegetation
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	1
Grass cover (%)	60	**Herb cover (%)**	50

Site details			
Site	**AQU-27**	**Position (WGS84)**	115.3112, -34.2375
Slope	negligible	**Topography**	seasonally wet area
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
High-quality vegetation throughout sumpland. Vegetation consists of Eucalyptus over Melaleuca over Acacia and dense mixed shrubs over sedges over shallow water. Two frog species present and no waterbirds. Area is legally protected (R 42377). Same remnant as AQU-26 and VER-15.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, weed infestation, vehicle tracks		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	140	**Litter distribution**	none
Tree cover (%)	10	**Litter depth (cm)**	0.0
Shrub cover (%)	80	**Litter cover (%)**	0
Grass cover (%)	30	**Herb cover (%)**	20

Site details			
Site	**AQU-28**	**Position (WGS84)**	115.3125, -34.2349
Slope	negligible	**Topography**	seasonally wet area
Soil colour	brown, black	**Soil texture**	clay loam, sandy loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Seasonally inundated sedgeland. High-quality vegetation throughout sumpland. Vegetation consists of occasional Eucalypt (Paperbark), Myrtaceae and Acacia shrubs over mixed dense shrubs and sedges. Expansive areas of shallow open water extending into paddock. Aquatic plants and 2 frog species present.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	current operations, grazing-low, vehicle tracks, weed infestation, large-scale clearing, livestock tracks		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	165	**Litter distribution**	none
Tree cover (%)	15	**Litter depth (cm)**	0.0
Shrub cover (%)	80	**Litter cover (%)**	0
Grass cover (%)	40	**Herb cover (%)**	30

Site details			
Site	**AQU-29**	**Position (WGS84)**	115.3126, -34.2349
Slope	negligible	**Topography**	depression
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Large sumpland with limited native vegetation. Vegetation consists of sparse Melaleuca trees (Paperbark) over occasional sedges around periphery of large open waterbody. A large dead tree overhangs the water, being used by cormorants for perching. Ticking Frogs, Shelducks and Pacific Black Ducks present.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	current operations, grazing-low, vehicle tracks, large-scale clearing		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	200	**Litter distribution**	none
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	1
Grass cover (%)	80	**Herb cover (%)**	60

Site details			
Site	**AQU-30**	**Position (WGS84)**	115.3077, -34.2323
Slope	negligible	**Topography**	depression
Soil colour	black, brown	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Large seasonally inundated shrubland with vegetation relatively intact. Vegetation consists of Melaleuca over mixed shrubs and sedges. Moderate-heavy grazing on outer edges of waterbody has led to damage to overstorey, sedges remain. Frogs present, no waterbirds.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	170	**Litter distribution**	none
Tree cover (%)	30	**Litter depth (cm)**	0.0
Shrub cover (%)	50	**Litter cover (%)**	0
Grass cover (%)	60	**Herb cover (%)**	30

Site details			
Site	**AQU-31**	**Position (WGS84)**	115.3131, -34.2322
Slope	negligible	**Topography**	depression
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Seasonally inundated sedgeland, with little to no native vegetation remaining at periphery. A single dead tree being used by cormorants along with a few Melaleuca, over occasional sedges. Shelducks and Ticking Frogs present.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	current operations, evidence of feral animals, grazing-low, large-scale clearing, weed infestation, livestock tracks		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	115	**Litter distribution**	none
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	10	**Litter cover (%)**	1
Grass cover (%)	60	**Herb cover (%)**	40

Site details			
Site	**AQU-32**	**Position (WGS84)**	115.2807, -34.2114
Slope	negligible	**Topography**	depression
Soil colour	brown, black	**Soil texture**	clay loam, sandy loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Completely degraded sumpland in the middle of a paddock. No native vegetation remaining.			
Habitat	Cleared - degraded sumpland		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Completely Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	100	**Litter distribution**	none
Tree cover (%)	0	**Litter depth (cm)**	0.0
Shrub cover (%)	0	**Litter cover (%)**	0
Grass cover (%)	60	**Herb cover (%)**	40

Site details			
Site	**AQU-33**	**Position (WGS84)**	115.2818, -34.2188
Slope	negligible	**Topography**	floodplain
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Completely degraded sumpland. Likely holding more water for longer as a result of nearby road preventing flow. Some dead Melaleuca present, no other native vegetation.			
Habitat	Cleared - degraded sumpland		
Disturbance	current operations, grazing-low, livestock tracks, vehicle tracks, weed infestation, large-scale clearing		
Vegetation condition	Completely Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	145	**Litter distribution**	none
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	0	**Litter cover (%)**	1
Grass cover (%)	100	**Herb cover (%)**	40

Site details			
Site	**AQU-34**	**Position (WGS84)**	115.2847, -34.2101
Slope	negligible	**Topography**	depression
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Large sumpland. Vegetation largely intact in places, but also much disturbance and weed (grass) infestation, also disturbance from heavy waterbird roosting - highest density of waterbirds observed in a wetland to date. Vegetation consists of Myrtaceae trees over Melaleuca (Paperbarks), over grass and sedges at margin. Possibly perennially inundated. See also site VER-37.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, weed infestation, vehicle tracks		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	110	**Litter distribution**	none
Tree cover (%)	10	**Litter depth (cm)**	0.0
Shrub cover (%)	20	**Litter cover (%)**	0
Grass cover (%)	60	**Herb cover (%)**	20

Site details			
Site	**AQU-35**	**Position (WGS84)**	115.2886, -34.2118
Slope	negligible	**Topography**	depression
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Vegetation surrounding sumpland largely intact and in good condition. Large Myrtaceae trees over Melaleuca (Paperbark), over mixed shrubs, over sedges and grasses. Pacific Black Ducks, Rattling and Squelching Frogs present. Possibly perennially inundated.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, livestock tracks, vehicle tracks, weed infestation, large-scale clearing		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	120	**Litter distribution**	under vegetation
Tree cover (%)	15	**Litter depth (cm)**	1.0
Shrub cover (%)	15	**Litter cover (%)**	1
Grass cover (%)	60	**Herb cover (%)**	30

Site details			
Site	**AQU-36**	**Position (WGS84)**	115.2921, -34.2082
Slope	negligible	**Topography**	seasonally wet area
Soil colour	black, brown	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Large, seasonally inundated Paperbark wetland (sumpland), potentially inundated year-round. Very tall Myrtaceae trees over some very old dead Melaleuca (Paperbark), over smaller Melaleuca sp. and mixed shrubs and sedges. Possibly perennially inundated.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	70	**Litter distribution**	scattered
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	5
Grass cover (%)	5	**Herb cover (%)**	5

Site details			
Site	**AQU-37**	**Position (WGS84)**	115.2983, -34.2206
Slope	negligible	**Topography**	floodplain
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	5	**Rock type**	limestone

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	29 Aug 2023	29 Aug 2023
1	Foraging - vertebrates	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)			
Seasonally inundated sedgeland where vegetation structure likely altered as a result of surrounding bluegum plantation. Vegetation consists of sparse Melaleuca tall shrubs, over sedges and grasses, with some areas of shallow open water. Small area of exposed limestone also present.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	140	**Litter distribution**	under vegetation
Tree cover (%)	40	**Litter depth (cm)**	1.0
Shrub cover (%)	20	**Litter cover (%)**	5
Grass cover (%)	60	**Herb cover (%)**	20

Site details			
Site	**AQU-38**	**Position (WGS84)**	115.3004, -34.2602
Slope	negligible	**Topography**	floodplain
Soil colour	black, brown	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Large sumpland with almost no native vegetation remaining in middle of paddock. Some small sedges remaining. Wetland entirely open body of shallow water. Aquatic plants present.			
Habitat	Cleared - degraded sumpland		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, vehicle tracks		
Vegetation condition	Completely Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	115	**Litter distribution**	concentrated in drifts
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	0	**Litter cover (%)**	15
Grass cover (%)	70	**Herb cover (%)**	40

Site details			
Site	**AQU-39**	**Position (WGS84)**	115.2982, -34.2578
Slope	negligible	**Topography**	floodplain
Soil colour	brown, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	1	**Rock type**	laterite

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Highly degraded sumpland in the middle of a paddock. Limited native vegetation remaining besides sedges around the edges of the wetland. Some dead Melaleuca remaining in the middle of the wetland.			
Habitat	Cleared - degraded sumpland		
Disturbance	current operations, grazing-low, vehicle tracks, livestock tracks, weed infestation		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	110	**Litter distribution**	none
Tree cover (%)	5	**Litter depth (cm)**	0.0
Shrub cover (%)	5	**Litter cover (%)**	0
Grass cover (%)	80	**Herb cover (%)**	20

Site details			
Site	**AQU-40**	**Position (WGS84)**	115.3021, -34.2561
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Large lake. Vegetation consists of peppermint trees around the northern and western perimeter, a stand of Melaleuca (Paperbark) in the middle and sedges on the eastern side. Site highly impacted by grazing livestock with tracks under tree stands and at waters edge. Despite this impact, many different waterbirds present and ticking Frogs present. Possibly perennially inundated. See also site VER-39.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, livestock tracks, weed infestation, large-scale clearing		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	155	**Litter distribution**	none
Tree cover (%)	40	**Litter depth (cm)**	0.0
Shrub cover (%)	0	**Litter cover (%)**	0
Grass cover (%)	70	**Herb cover (%)**	45

Site details			
Site	**AQU-41**	**Position (WGS84)**	115.2908, -34.2154
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Large lake. Vegetation consists of peppermint trees, Eucalypts and Myrtaceae trees, over Melaleuca tall shrubs, over mixed sedges, and aquatic plants. Large area of open water with Duckweed abundant.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, livestock tracks, weed infestation, large-scale clearing		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	140	**Litter distribution**	scattered
Tree cover (%)	30	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	1
Grass cover (%)	50	**Herb cover (%)**	20

Site details			
Site	**AQU-42**	**Position (WGS84)**	115.2863, -34.2172
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Medium-sized sumpland with some native vegetation remaining. Vegetation consists of occasional stands of Melaleuca (Paperbark), over mixed sedges, surrounding open waterbody.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	135	**Litter distribution**	none
Tree cover (%)	10	**Litter depth (cm)**	0.0
Shrub cover (%)	15	**Litter cover (%)**	0
Grass cover (%)	80	**Herb cover (%)**	30

Site details			
Site	**AQU-43**	**Position (WGS84)**	115.2895, -34.2172
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023
1	Site description	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Seasonally inundated wetland. Vegetation consists of Melaleucas (Paperbarks) and Eucalypts, over Lepidosperma and other sedges, over grasses. Surrounded by paddocks. Remnant same as per site VER-36.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	120	**Litter distribution**	none
Tree cover (%)	10	**Litter depth (cm)**	0.0
Shrub cover (%)	10	**Litter cover (%)**	0
Grass cover (%)	30	**Herb cover (%)**	30

Site details			
Site	**AQU-44**	**Position (WGS84)**	115.2962, -34.2283
Slope	negligible	**Topography**	floodplain
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Seasonally inundated Paperbark dominated sumpland. Vegetation structure altered, consisting of stands of Paperbark, as well as Acacia, Eucalypt and Melaleuca, over mixed shrubs and sedges, over grass and herbs, with some open, cleared edges surrounding open waterbody.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, vehicle tracks, weed infestation, livestock tracks		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	125	**Litter distribution**	under vegetation
Tree cover (%)	30	**Litter depth (cm)**	2.0
Shrub cover (%)	20	**Litter cover (%)**	5
Grass cover (%)	60	**Herb cover (%)**	15

Site details			
Site	**AQU-45**	**Position (WGS84)**	115.2995, -34.2311
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Large lake with limited midstorey that has been impacted by grazing. Remaining vegetation consists of Myrtaceae and Eucalypts trees, over occasional Melaleuca (Paperbark), over mixed sedges, and extensive paddock grasses almost continuous surrounding the lake. Same wetland as site VER-35.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, livestock tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	80	**Litter distribution**	none
Tree cover (%)	15	**Litter depth (cm)**	0.0
Shrub cover (%)	5	**Litter cover (%)**	0
Grass cover (%)	30	**Herb cover (%)**	30

Site details			
Site	**AQU-46**	**Position (WGS84)**	115.3058, -34.2351
Slope	negligible	**Topography**	floodplain
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Seasonally inundated sedgeland wetland on northern boundary of protected land R 42377. Vegetation consists of Eucalypt spp., over mixed shrubs, over mixed sedges and grasses.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	150	**Litter distribution**	sparse
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	2
Grass cover (%)	60	**Herb cover (%)**	30

Site details			
Site	**AQU-47**	**Position (WGS84)**	115.3035, -34.2301
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Seasonally inundated shrubland wetland. Large area of shallow, open water surrounded by relatively intact vegetation. Vegetation consists of occasional Eucalypt spp., over large Melaleucas (Paperbark), over large expanses of mixed sedges. Abundant frogs calling and few waterbirds present. Same vegetation complex as site VER-33			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	140	**Litter distribution**	sparse
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	20	**Litter cover (%)**	2
Grass cover (%)	80	**Herb cover (%)**	20

Site details			
Site	**AQU-48**	**Position (WGS84)**	115.3105, -34.2299
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Large, seasonally inundated Paperbark wetland. Vegetation relatively intact, consisting of Melaleuca (Paperbark), over mixed Acacia and other shrubs, over sedges and grasses. Water covered by Duckweed. Multiple frog species present, with some waterbirds and bush birds present.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	90	**Litter distribution**	scattered
Tree cover (%)	40	**Litter depth (cm)**	1.0
Shrub cover (%)	10	**Litter cover (%)**	5
Grass cover (%)	30	**Herb cover (%)**	10

Site details			
Site	**AQU-49**	**Position (WGS84)**	115.3125, -34.2273
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Seasonally inundated Paperbark wetland. Dense vegetation consisting of Myrtaceae and Melaleuca (Paperbark) trees, over Acacia and other shrubs, over sedges and grasses. Aquatic plants present. Water shallow throughout.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, livestock tracks, large-scale clearing, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	180	**Litter distribution**	scattered
Tree cover (%)	50	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	5
Grass cover (%)	70	**Herb cover (%)**	20

Site details			
Site	**AQU-50**	**Position (WGS84)**	115.3050, -34.2276
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Seasonally inundated shrubland wetland. Large wetland, vegetation consists of Myrtaceae tall shrubs, over mixed mid-low shrubs and sedges. Water body shallow throughout.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	current operations, grazing-low, livestock tracks, large-scale clearing, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	80	**Litter distribution**	none
Tree cover (%)	10	**Litter depth (cm)**	0.0
Shrub cover (%)	60	**Litter cover (%)**	0
Grass cover (%)	5	**Herb cover (%)**	5

Site details			
Site	**AQU-51**	**Position (WGS84)**	115.3052, -34.2251
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Seasonally inundated sedgeland wetland. Vegetation consists of mixed sedges with the occasional Melaleuca spp. tall shrub or low tree. Water body shallow throughout. Lots of clicking frogs. White-faced heron foraging in grasses at periphery. Carnaby's Cockatoo coming in to drink.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, weed infestation, livestock tracks		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	102	**Litter distribution**	none
Tree cover (%)	2	**Litter depth (cm)**	0.0
Shrub cover (%)	30	**Litter cover (%)**	0
Grass cover (%)	60	**Herb cover (%)**	10

Site details			
Site	**AQU-52**	**Position (WGS84)**	115.3012, -34.2244
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Series of degraded, hydrologically connected sumplands. Vegetation consists of low, sparse sedges and paddock grasses.			
Habitat	Cleared - degraded sumpland		
Disturbance	current operations, grazing-low, large-scale clearing, vehicle tracks, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	112	**Litter distribution**	none
Tree cover (%)	2	**Litter depth (cm)**	0.0
Shrub cover (%)	0	**Litter cover (%)**	0
Grass cover (%)	90	**Herb cover (%)**	20

Site details			
Site	**AQU-53**	**Position (WGS84)**	115.3004, -34.2267
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Large seasonally inundated sedgeland wetland. Predominantly covered by sedges with some stands of taller mixed shrubs. Very shallow water throughout, drying out. Aquatic plants and several frog species present.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	122	**Litter distribution**	none
Tree cover (%)	2	**Litter depth (cm)**	0.0
Shrub cover (%)	20	**Litter cover (%)**	0
Grass cover (%)	80	**Herb cover (%)**	20

Site details			
Site	**AQU-54**	**Position (WGS84)**	115.3142, -34.2057
Slope	negligible	**Topography**	riparian
Soil colour	black	**Soil texture**	clay loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	31 Aug 2023	31 Aug 2023

Site description - visit 1 (31 Aug 2023)			
Seasonally inundated Paperbark wetland. Medium-sized sumpland, vegetation structure likely altered as a result of bluegum plantation to the south. Vegetation consists of few Melaleuca (Paperbarks), over sedges and grasses with some areas of shallow open water. Small area of exposed limestone.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	140	**Litter distribution**	under vegetation
Tree cover (%)	40	**Litter depth (cm)**	1.0
Shrub cover (%)	20	**Litter cover (%)**	5
Grass cover (%)	60	**Herb cover (%)**	20

Site details			
Site	**AQU-55**	**Position (WGS84)**	115.3006, -34.2070
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	31 Aug 2023	31 Aug 2023
1	Foraging - vertebrates	31 Aug 2023	31 Aug 2023

Site description - visit 1 (31 Aug 2023)			
Seasonally inundated Paperbark wetland. Medium-sized sumpland with vegetation structure altered. Vegetation consisting of Melaleuca (Paperbark), over mixed fringing sedges, and grasses. One section of wetland open and covered in sedges and low water. The other is a closed Melaleuca (Paperbark).			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, vehicle tracks, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	120	**Litter distribution**	even/continuous
Tree cover (%)	50	**Litter depth (cm)**	3.0
Shrub cover (%)	40	**Litter cover (%)**	10
Grass cover (%)	10	**Herb cover (%)**	20

Site details			
Site	**AQU-56**	**Position (WGS84)**	115.2955, -34.2011
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	31 Aug 2023	31 Aug 2023
1	Foraging - vertebrates	31 Aug 2023	31 Aug 2023

Site description - visit 1 (31 Aug 2023)			
Large complex aggregation of seasonally inundated shrublands. Vegetation consists of Melaleuca ssp. over mixed shrubs and sedges, over grasses and aquatic plants. Lots of frogs and waterbirds using wetland. An area of open water in the middle a result of fenceline clearing.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	current operations, firebreak, grazing-low, large-scale clearing, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	92	**Litter distribution**	none
Tree cover (%)	2	**Litter depth (cm)**	0.0
Shrub cover (%)	70	**Litter cover (%)**	0
Grass cover (%)	10	**Herb cover (%)**	10

Site details			
Site	**AQU-57**	**Position (WGS84)**	115.2935, -34.1984
Slope	negligible	**Topography**	floodplain
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	31 Aug 2023	31 Aug 2023
1	Foraging - vertebrates	31 Aug 2023	31 Aug 2023

Site description - visit 1 (31 Aug 2023)			
Sumpland with relatively intact vegetation consisting of a mosaic of shrubland and sedgeland with some taller Melaleucas throughout. Occasional grass trees around the drier parts of the wetland. Frogs and waterbirds present.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	current operations, grazing-low, large-scale clearing, livestock tracks, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	140	**Litter distribution**	none
Tree cover (%)	20	**Litter depth (cm)**	0.0
Shrub cover (%)	80	**Litter cover (%)**	0
Grass cover (%)	20	**Herb cover (%)**	20

Site details			
Site	**AQU-58**	**Position (WGS84)**	115.3081, -34.2198
Slope	negligible	**Topography**	riparian
Soil colour	black, grey	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Seasonally inundated Paperbark wetland, surrounded by good-quality bushland and set in middle of a Bluegum plantation. Surrounding land use likely degrading the habitat. Vegetation consists of Melaleuca (Paperbark) trees, over mixed shrubs and sedges. Frogs present.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, evidence of feral animals, firebreak, grazing-low, vehicle tracks, historic clearing		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	125	**Litter distribution**	even/continuous
Tree cover (%)	80	**Litter depth (cm)**	3.0
Shrub cover (%)	20	**Litter cover (%)**	80
Grass cover (%)	20	**Herb cover (%)**	5

Site details			
Site	**AQU-59**	**Position (WGS84)**	115.3074, -34.2187
Slope	negligible	**Topography**	depression
Soil colour	brown-grey, black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Small seasonally inundated Paperbark wetland. Vegetation predominantly head-high juvenile Melaleuca (Paperbark) but with clumps of taller dead Melaleuca (Paperbark) in the middle of the water body. Approximately 25% open water.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, firebreak, grazing-low, large-scale clearing, historic clearing, vehicle tracks, weed infestation, evidence of feral animals		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	88	**Litter distribution**	even/continuous
Tree cover (%)	80	**Litter depth (cm)**	3.0
Shrub cover (%)	5	**Litter cover (%)**	80
Grass cover (%)	2	**Herb cover (%)**	1

Site details			
Site	**AQU-60**	**Position (WGS84)**	115.3159, -34.2065
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	31 Aug 2023	31 Aug 2023
1	Foraging - vertebrates	31 Aug 2023	31 Aug 2023

Site description - visit 1 (31 Aug 2023)			
Seasonally inundated Paperbark woodland (dampland). Vegetation relatively intact, but midstorey limited. Vegetation consists of Melaleuca (Paperbark; some with hollows) over mixed herbs. Located in the middle of the large Bluegum plantation on eastern side of study area. Some water holding between bluegum rows. Identical to site AQU-61.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, firebreak, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	125	**Litter distribution**	even/continuous
Tree cover (%)	70	**Litter depth (cm)**	3.0
Shrub cover (%)	5	**Litter cover (%)**	80
Grass cover (%)	20	**Herb cover (%)**	30

Site details			
Site	**AQU-61**	**Position (WGS84)**	115.3120, -34.2067
Slope	negligible	**Topography**	depression
Soil colour	black	**Soil texture**	clay loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	31 Aug 2023	31 Aug 2023
1	Foraging - vertebrates	31 Aug 2023	31 Aug 2023

Site description - visit 1 (31 Aug 2023)			
Seasonally inundated Paperbark woodland (dampland). Vegetation relatively intact, but mid-storey limited. Vegetation consists of Melaleuca (some with hollows; Paperbark) over mixed herbs. Located in the middle of the large Bluegum plantation on eastern side of study area. Some water holding between bluegum rows. Identical to site AQU-60.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-low, firebreak, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	125	**Litter distribution**	even/continuous
Tree cover (%)	70	**Litter depth (cm)**	3.0
Shrub cover (%)	5	**Litter cover (%)**	80
Grass cover (%)	20	**Herb cover (%)**	30

Site details			
Site	**AQU-62**	**Position (WGS84)**	115.2983, -34.2120
Slope	negligible	**Topography**	depression
Soil colour	black, brown	**Soil texture**	clay loam, loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	30 Aug 2023	30 Aug 2023
1	Foraging - vertebrates	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)			
Seasonally inundated Paperbark wetland. Vegetation consists of Melaleuca (Paperbark), over mixed sedges. Large areas of shallow water. Several frogs present but no waterbirds observed. Located in the middle of the eastern bluegum plantation.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, evidence of feral animals, grazing-low, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	97	**Litter distribution**	even/continuous
Tree cover (%)	80	**Litter depth (cm)**	3.0
Shrub cover (%)	5	**Litter cover (%)**	80
Grass cover (%)	10	**Herb cover (%)**	2

Site details			
Site	**Mowl01**	**Position (WGS84)**	115.2702, -34.2597
Slope	gentle	**Topography**	creek
Soil colour	brown	**Soil texture**	sandy loam
Rock cover (%)		**Rock type**	

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Audio recording	25 May 2023	26 May 2023
1	Site description	25 May 2023	25 May 2023

Site description - visit 1 (25 May 2023)			
Scott River riparian woodland of Agonis flexuosa (peppermint) trees and Corymbia calophylla (Marri) over dense shrubs and introduced grasses.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	Weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	167	**Litter distribution**	even/continuous
Tree cover (%)	70	**Litter depth (cm)**	5.0
Shrub cover (%)	60	**Litter cover (%)**	35
Grass cover (%)	35	**Herb cover (%)**	2

Site details			
Site	**SM4-01**	**Position (WGS84)**	115.3143, -34.1998
Slope	negligible	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	sandy loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Audio recording	29 Nov 2024	01 Feb 2025
1	Site description	29 Nov 2024	29 Nov 2024

Site description - visit 1 (29 Nov 2024)			
Jarrah-marri-peppermint woodland, with old (but relatively short) trees containing hollows and many small trees coming through. Mid and understorey fairly sparse, but dense ground cover of Lomandra and other species. Plentiful log debris on the floor. Almost identical to site SM4-02, likely were both a single stand historically.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance			
Vegetation condition	Pristine	**Fire age**	moderate (5-10 years)
Total veg. cover (%)	91	**Litter distribution**	even/continuous
Tree cover (%)	80	**Litter depth (cm)**	2.0
Shrub cover (%)	5	**Litter cover (%)**	20
Grass cover (%)	5	**Herb cover (%)**	1

Site details			
Site	**SM4-02**	**Position (WGS84)**	115.3120, -34.1996
Slope	negligible	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	sandy loam
Rock cover (%)	2	**Rock type**	laterite

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Audio recording	29 Nov 2024	01 Feb 2025
1	Site description	29 Nov 2024	29 Nov 2024

Site description - visit 1 (29 Nov 2024)			
Jarrah-marri-peppermint woodland, with old (but relatively short) trees containing hollows and many small trees coming through. Mid and understorey fairly sparse, but dense ground cover of Lomandra and other species. Plentiful log debris on the floor. Almost identical to site SM4-01, likely were both a single stand historically.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance			
Vegetation condition	Pristine	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	96	**Litter distribution**	even/continuous
Tree cover (%)	65	**Litter depth (cm)**	0.0
Shrub cover (%)	20	**Litter cover (%)**	20
Grass cover (%)	10	**Herb cover (%)**	1

Site details			
Site	**SM4-03 (failed)**	**Position (WGS84)**	115.3203, -34.2375
Slope	negligible	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	sandy loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Audio recording	29 Nov 2024	29 Nov 2024
1	Site description	29 Nov 2024	29 Nov 2024

Site description - visit 1 (29 Nov 2024)			
See veg mapping			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	grazing-high		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	170	**Litter distribution**	even/continuous
Tree cover (%)	70	**Litter depth (cm)**	0.5
Shrub cover (%)	0	**Litter cover (%)**	5
Grass cover (%)	100	**Herb cover (%)**	0

Site details			
Site	**SM4-04**	**Position (WGS84)**	115.3215, -34.2455
Slope	negligible	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	sandy loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Audio recording	29 Nov 2024	03 Feb 2025
1	Site description	29 Nov 2024	29 Nov 2024

Site description - visit 1 (29 Nov 2024)			
Jarrah-marri-peppermint woodland, with old (but relatively short) trees, some with hollows. Relatively dense canopy, mid-storey of peppermint, Banksia and Persoonia. Plentiful log debris on the floor. Very similar to SM4-05.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	111	**Litter distribution**	even/continuous
Tree cover (%)	80	**Litter depth (cm)**	2.0
Shrub cover (%)	10	**Litter cover (%)**	35
Grass cover (%)	20	**Herb cover (%)**	1

Site details			
Site	**SM4-05**	**Position (WGS84)**	115.2828, -34.2510
Slope	negligible	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	sandy loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Audio recording	29 Nov 2024	24 Jan 2025
1	Site description	29 Nov 2024	29 Nov 2024

Site description - visit 1 (29 Nov 2024)			
Jarrah-marri-peppermint woodland, with old (but relatively short) trees, some with hollows. Relatively dense canopy, mid-storey of peppermint, Banksia and Persoonia. Plentiful log debris on the floor. Very similar to SM4-04.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance			
Vegetation condition	Pristine	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	131	**Litter distribution**	even/continuous
Tree cover (%)	85	**Litter depth (cm)**	2.0
Shrub cover (%)	15	**Litter cover (%)**	30
Grass cover (%)	30	**Herb cover (%)**	1

Site details			
Site	**SM4-06**	**Position (WGS84)**	115.2732, -34.1919
Slope	negligible	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	sandy loam
Rock cover (%)	1	**Rock type**	laterite

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Audio recording	29 Nov 2024	20 Dec 2024
1	Site description	29 Nov 2024	29 Nov 2024

Site description - visit 1 (29 Nov 2024)			
Jarrah-marri-peppermint woodland of variable condition. Closed canopy in areas, open elsewhere. Mid-storey of Banksia and Persoonia, with shrub layer present in best areas; no shrubs in degraded patches. Plentiful log debris on the floor, but paddock weeds encroaching.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	152	**Litter distribution**	even/continuous
Tree cover (%)	70	**Litter depth (cm)**	2.0
Shrub cover (%)	30	**Litter cover (%)**	25
Grass cover (%)	50	**Herb cover (%)**	2

Site details			
Site	**SM4-07**	**Position (WGS84)**	115.2695, -34.1920
Slope	negligible	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	sandy loam
Rock cover (%)	1	**Rock type**	laterite

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Audio recording	29 Nov 2024	01 Feb 2025
1	Site description	29 Nov 2024	29 Nov 2024

Site description - visit 1 (29 Nov 2024)			
Jarrah-marri-peppermint woodland, with older trees, but few with hollows. Canopy open. Mid-storey of Banksia, Persoonia and Agonis sp. Plentiful log debris on the floor. Weeds encroaching at margins throughout.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance			
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	96	**Litter distribution**	even/continuous
Tree cover (%)	30	**Litter depth (cm)**	0.5
Shrub cover (%)	15	**Litter cover (%)**	20
Grass cover (%)	50	**Herb cover (%)**	1

Site details			
Site	**VER-01**	**Position (WGS84)**	115.2730, -34.1741
Slope	negligible	**Topography**	undulating plain
Soil colour	light-brown	**Soil texture**	clay loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Opportunistic sighting	10 Dec 2023	10 Dec 2023
1	Site description	12 Dec 2023	12 Dec 2023

Site description - visit 1 (12 Dec 2023)			
Bluegum plantation surrounded by grazing paddocks.			
Habitat	Bluegum plantation		
Disturbance	current operations, evidence of feral animals, grazing-high, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	102	**Litter distribution**	under vegetation
Tree cover (%)	30	**Litter depth (cm)**	1.0
Shrub cover (%)	10	**Litter cover (%)**	30
Grass cover (%)	60	**Herb cover (%)**	2

Site details			
Site	**VER-02**	**Position (WGS84)**	115.2679, -34.1928
Slope	negligible	**Topography**	floodplain
Soil colour	light-brown	**Soil texture**	clay loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	12 Dec 2023	12 Dec 2023

Site description - visit 1 (12 Dec 2023)			
Marri-Jarrah-Peppermint woodland. Small patch of remnant vegetation surrounded by Bluegum plantations. Remnant vegetation consists of young Jarrah over mixed sedges, Tea Tree, Woolly Bush, and other shrubs, over grass.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, evidence of feral animals, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	92	**Litter distribution**	under vegetation
Tree cover (%)	50	**Litter depth (cm)**	3.0
Shrub cover (%)	30	**Litter cover (%)**	20
Grass cover (%)	10	**Herb cover (%)**	2

Site details			
Site	**VER-03**	**Position (WGS84)**	115.2671, -34.1964
Slope	negligible	**Topography**	floodplain
Soil colour	light-brown	**Soil texture**	clay loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	12 Dec 2023	12 Dec 2023

Site description - visit 1 (12 Dec 2023)			
Small remnant of open peppermint woodland degraded). Vegetation on eastern side of road with occasional Jarrah, over peppermint trees, Mid-storey of mixed Acacia, over sedges and mixed grasses. Bluegum plantation present on western side of road. Not suitable black cockatoo breeding habitat.			
Habitat	Open woodland of Peppermint trees (degraded)		
Disturbance	current operations, evidence of feral animals, firebreak, vehicle tracks, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	95	**Litter distribution**	under vegetation
Tree cover (%)	40	**Litter depth (cm)**	1.0
Shrub cover (%)	30	**Litter cover (%)**	30
Grass cover (%)	20	**Herb cover (%)**	5

Site details			
Site	**VER-04**	**Position (WGS84)**	115.3216, -34.2461
Slope	gentle	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	11 Dec 2023	11 Dec 2023
1	Foraging - nocturnal	11 Dec 2023	11 Dec 2023

Site description - visit 1 (11 Dec 2023)			
Marri-Jarrah-Peppermint woodland. Roadside remnant surrounded by paddocks. Peppermint and Jarrah, over mid-storey of Banksia, over Grass Trees, young Eucalypts, sedges and Tea Tree. Roadside weeds occur atop loam substrate.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	81	**Litter distribution**	under vegetation
Tree cover (%)	25	**Litter depth (cm)**	1.0
Shrub cover (%)	35	**Litter cover (%)**	20
Grass cover (%)	20	**Herb cover (%)**	1

Site details			
Site	**VER-05**	**Position (WGS84)**	115.3121, -34.2002
Slope	negligible	**Topography**	undulating plain
Soil colour	light-brown	**Soil texture**	loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	10 Dec 2023	10 Dec 2023

Site description - visit 1 (10 Dec 2023)			
Marri-Jarrah-Peppermint woodland. Jarrah, over mixed Acacia, Melaleuca, over Grass Trees and Tea Trees, over mixed sedges and grasses. Substrate is light brown loamy-sand.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	evidence of feral animals, erosion channels, grazing-high, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Very Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	155	**Litter distribution**	scattered
Tree cover (%)	40	**Litter depth (cm)**	1.0
Shrub cover (%)	50	**Litter cover (%)**	20
Grass cover (%)	60	**Herb cover (%)**	5

Site details			
Site	**VER-06**	**Position (WGS84)**	115.2894, -34.1974
Slope	negligible	**Topography**	seasonally wet area
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	10 Dec 2023	10 Dec 2023
1	Opportunistic sighting	10 Dec 2023	10 Dec 2023

Site description - visit 1 (10 Dec 2023)			
Seasonally inundated wetland surrounded by paddocks. Tea Tree and Melaleucas over younger Tea Tree, Grass Trees, and Acacias. Understorey of Lepidosperma and other sedges, over infestation of weeds.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	current operations, evidence of feral animals, livestock tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	110	**Litter distribution**	under vegetation
Tree cover (%)	15	**Litter depth (cm)**	1.0
Shrub cover (%)	65	**Litter cover (%)**	5
Grass cover (%)	20	**Herb cover (%)**	10

Site details			
Site	**VER-07**	**Position (WGS84)**	115.2956, -34.1979
Slope	negligible	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	10 Dec 2023	10 Dec 2023

Site description - visit 1 (10 Dec 2023)			
Marri-Jarrah-Peppermint woodland. Over storey of Jarrah, over Tea Trees, over Grass Trees, Lepidosperma and other sedges and Acacias. Grasses invading from edge.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, evidence of feral animals, historic clearing		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	125	**Litter distribution**	under vegetation
Tree cover (%)	55	**Litter depth (cm)**	1.0
Shrub cover (%)	50	**Litter cover (%)**	15
Grass cover (%)	10	**Herb cover (%)**	10

Site details			
Site	**VER-08**	**Position (WGS84)**	115.2946, -34.1975
Slope	negligible	**Topography**	seasonally wet area
Soil colour	brown	**Soil texture**	clay loam, loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	10 Dec 2023	10 Dec 2023
1	Opportunistic sighting	10 Dec 2023	10 Dec 2023
1	Foraging - nocturnal	11 Dec 2023	11 Dec 2023

Site description - visit 1 (10 Dec 2023)			
Seasonally inundated shrubland wetland. Occasional Melaleuca (Paperbark) over Tea Trees, Christmas trees and smaller Melaleuca thickets, over mixed shrubs, herbs and grasses. Aquatic plants present in places. Located in same remnant, NE of site AQU-57.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	evidence of feral animals, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	101	**Litter distribution**	even/continuous
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	90	**Litter cover (%)**	40
Grass cover (%)	5	**Herb cover (%)**	1

Site details			
Site	**VER-09**	**Position (WGS84)**	115.2949, -34.2002
Slope	gentle	**Topography**	seasonally wet area
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	10 Dec 2023	10 Dec 2023
1	Opportunistic sighting	10 Dec 2023	10 Dec 2023

Site description - visit 1 (10 Dec 2023)			
Seasonally inundated wetland surrounded by paddocks. Vegetation consists of occasional Melaleucas (Paperbark), over Tea Tree, Acacias and Myrtaceae shrubs, over Bracken fern, Lepidosperma and other sedges.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	current operations, grazing-high, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	140	**Litter distribution**	under vegetation
Tree cover (%)	50	**Litter depth (cm)**	1.0
Shrub cover (%)	60	**Litter cover (%)**	20
Grass cover (%)	20	**Herb cover (%)**	10

Site details			
Site	**VER-10**	**Position (WGS84)**	115.3035, -34.2100
Slope	negligible	**Topography**	undulating plain
Soil colour	whitish	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	09 Dec 2023	09 Dec 2023

Site description - visit 1 (09 Dec 2023)			
Degraded open woodland of Peppermint trees, no understorey. Located within eastern Bluegum plantation.			
Habitat	Open woodland of Peppermint trees (degraded)		
Disturbance	current operations, erosion channels, firebreak, historic clearing, vehicle tracks		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	40	**Litter distribution**	under vegetation
Tree cover (%)	25	**Litter depth (cm)**	1.0
Shrub cover (%)	0	**Litter cover (%)**	35
Grass cover (%)	5	**Herb cover (%)**	10

Site details			
Site	**VER-11**	**Position (WGS84)**	115.2977, -34.2208
Slope	negligible	**Topography**	undulating plain
Soil colour	whitish	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	09 Dec 2023	09 Dec 2023

Site description - visit 1 (09 Dec 2023)			
Degraded open woodland of Peppermint trees, with no understorey species present. Within the eastern Bluegum plantation.			
Habitat	Open woodland of Peppermint trees (degraded)		
Disturbance	current operations, firebreak, historic clearing, vehicle tracks		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	65	**Litter distribution**	under vegetation
Tree cover (%)	35	**Litter depth (cm)**	1.0
Shrub cover (%)	0	**Litter cover (%)**	30
Grass cover (%)	20	**Herb cover (%)**	10

Site details			
Site	**VER-12**	**Position (WGS84)**	115.3155, -34.2075
Slope	negligible	**Topography**	undulating plain
Soil colour	whitish	**Soil texture**	clay loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	09 Dec 2023	09 Dec 2023

Site description - visit 1 (09 Dec 2023)			
Seasonally inundated Paperbark wetland. Vegetation degraded, consists of Paperbarks, over grasses and weeds.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	erosion channels, firebreak, weed infestation, vehicle tracks		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	125	**Litter distribution**	under vegetation
Tree cover (%)	50	**Litter depth (cm)**	1.0
Shrub cover (%)	15	**Litter cover (%)**	5
Grass cover (%)	50	**Herb cover (%)**	10

Site details			
Site	**VER-13**	**Position (WGS84)**	115.3201, -34.2376
Slope	negligible	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	09 Dec 2023	09 Dec 2023
1	Opportunistic sighting	09 Dec 2023	09 Dec 2023
1	Foraging - nocturnal	11 Dec 2023	11 Dec 2023

Site description - visit 1 (09 Dec 2023)			
Marri-Jarrah-Peppermint woodland. Jarrah and Peppermint trees, over Eucalypt saplings, Acacia, and Conifers, over grass infestation.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, firebreak, grazing-high, historic clearing, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	100	**Litter distribution**	even/continuous
Tree cover (%)	35	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	30
Grass cover (%)	15	**Herb cover (%)**	10

Site details			
Site	**VER-14**	**Position (WGS84)**	115.2850, -34.2345
Slope	gentle	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	09 Dec 2023	09 Dec 2023

Site description - visit 1 (09 Dec 2023)			
Degraded open woodland of Peppermint trees with no understorey, just grass infestation.			
Habitat	Open woodland of Peppermint trees (degraded)		
Disturbance	current operations, grazing-high, firebreak, historic clearing, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Completely Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	96	**Litter distribution**	none
Tree cover (%)	10	**Litter depth (cm)**	1.0
Shrub cover (%)	0	**Litter cover (%)**	2
Grass cover (%)	85	**Herb cover (%)**	1

Site details			
Site	**VER-15**	**Position (WGS84)**	115.2965, -34.2374
Slope	negligible	**Topography**	seasonally wet area
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	09 Dec 2023	09 Dec 2023

Site description - visit 1 (09 Dec 2023)			
Seasonally inundated shrubland. Vegetation structure largely intact. Water mostly shallow puddles forming in low points between vegetation. Vegetation consists of Melaleuca over Acacia over sedges. Ticking Frogs present, no waterbirds. Area is legally protected (R 42377). Same remnant as AQU-27 and VER-15.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	erosion channels, current operations, firebreak, vehicle tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	110	**Litter distribution**	under vegetation
Tree cover (%)	10	**Litter depth (cm)**	1.0
Shrub cover (%)	75	**Litter cover (%)**	5
Grass cover (%)	15	**Herb cover (%)**	10

Site details			
Site	**VER-16**	**Position (WGS84)**	115.3064, -34.2399
Slope	negligible	**Topography**	drainage line
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	09 Dec 2023	09 Dec 2023
1	Birding	09 Dec 2023	09 Dec 2023
1	Opportunistic sighting	09 Dec 2023	09 Dec 2023
1	Foraging - vertebrates	09 Dec 2023	09 Dec 2023

Site description - visit 1 (09 Dec 2023)			
Seasonally inundated shrubland, surrounded by paddocks. Vegetation consists of Low Eucalypts, Agonis and Melaleuca, over Lepidosperma and other sedges, young Melaleucas and Acacias, over grasses invading from periphery.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	current operations, erosion channels, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	120	**Litter distribution**	under vegetation
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	60	**Litter cover (%)**	20
Grass cover (%)	30	**Herb cover (%)**	10

Site details			
Site	**VER-17**	**Position (WGS84)**	115.2697, -34.2602
Slope	negligible	**Topography**	creek
Soil colour	black, brown	**Soil texture**	clay loam
Rock cover (%)	5	**Rock type**	limestone

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	09 Dec 2023	09 Dec 2023
1	Audio recording	09 Dec 2023	12 Dec 2023
1	Ultrasonic recording	09 Dec 2023	12 Dec 2023
1	Opportunistic sighting	09 Dec 2023	09 Dec 2023

Site description - visit 1 (09 Dec 2023)			
Scott River (south bank) riparian zone. Vegetation consists of Eucalypts, over Peppermint trees and Melaleuca (Paperbarks) over Tea Trees, over Grass Trees and sedges on dark-brown loam soil.			
Habitat	Riparian zone (outside mapped extent)		
Disturbance	erosion channels, evidence of feral animals, firebreak, historic clearing, litter, weed infestation		
Vegetation condition	Good	**Fire age**	recent (1 year)
Total veg. cover (%)	155	**Litter distribution**	even/continuous
Tree cover (%)	40	**Litter depth (cm)**	1.0
Shrub cover (%)	50	**Litter cover (%)**	60
Grass cover (%)	60	**Herb cover (%)**	5

Site details			
Site	**VER-18**	**Position (WGS84)**	115.3217, -34.2064
Slope	negligible	**Topography**	undulating plain
Soil colour	whitish	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Bluegums and occasional Peppermint trees, over Grass Trees. Understorey is grass infestation only, on loamy substrate.			
Habitat	Bluegum plantation		
Disturbance	current operations, firebreak, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	77	**Litter distribution**	scattered
Tree cover (%)	2	**Litter depth (cm)**	1.0
Shrub cover (%)	5	**Litter cover (%)**	10
Grass cover (%)	70	**Herb cover (%)**	0

Site details			
Site	**VER-19**	**Position (WGS84)**	115.3228, -34.2286
Slope	negligible	**Topography**	undulating plain
Soil colour	whitish	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Roadside remnant of Marri-Jarrah-Peppermint woodland. Degraded understorey, with few species present.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, firebreak, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	100	**Litter distribution**	even/continuous
Tree cover (%)	40	**Litter depth (cm)**	1.0
Shrub cover (%)	10	**Litter cover (%)**	55
Grass cover (%)	50	**Herb cover (%)**	0

Site details			
Site	**VER-20**	**Position (WGS84)**	115.3238, -34.2402
Slope	gentle	**Topography**	undulating plain
Soil colour	brown-grey	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Remnant road vegetation and Bluegum plantation. Young Eucalypts, Allocasuarina and Peppermints over Bluegum saplings, Grass trees and Woolly Bush, over ground over of grass infestation, with some herbs, on loamy soils.			
Habitat	Bluegum plantation		
Disturbance	current operations, firebreak, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	110	**Litter distribution**	under vegetation
Tree cover (%)	40	**Litter depth (cm)**	1.0
Shrub cover (%)	30	**Litter cover (%)**	5
Grass cover (%)	30	**Herb cover (%)**	10

Site details			
Site	**VER-21**	**Position (WGS84)**	115.2830, -34.2518
Slope	negligible	**Topography**	undulating plain
Soil colour	brown-grey	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023
1	Birding	08 Dec 2023	08 Dec 2023
1	Foraging - nocturnal	10 Dec 2023	10 Dec 2023
1	Foraging - vertebrates	08 Dec 2023	08 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Marri-Jarrah-Peppermint woodland. Vegetation consists of Jarrah and Peppermint trees, over Tea Trees, over understorey of Grass Trees, Acacias, young Eucalypts and Australian Christmas tree, over ground cover of grass infestation, on loam substrate.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	155	**Litter distribution**	under vegetation
Tree cover (%)	30	**Litter depth (cm)**	1.0
Shrub cover (%)	80	**Litter cover (%)**	5
Grass cover (%)	35	**Herb cover (%)**	10

Site details			
Site	**VER-22**	**Position (WGS84)**	115.2698, -34.2505
Slope	negligible	**Topography**	undulating plain
Soil colour	red-brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023
1	Birding	08 Dec 2023	08 Dec 2023
1	Foraging - nocturnal	10 Dec 2023	10 Dec 2023
1	Foraging - vertebrates	08 Dec 2023	08 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Marri-Jarrah-Peppermint woodland. Vegetation consists of Peppermint trees, over midstorey of Tea Tree and Banksia and Acacias, over Kangaroo Paws, Eucalypt saplings and sedges, over ground cover of grasses and herbs.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	135	**Litter distribution**	under vegetation
Tree cover (%)	35	**Litter depth (cm)**	1.0
Shrub cover (%)	60	**Litter cover (%)**	30
Grass cover (%)	30	**Herb cover (%)**	10

Site details			
Site	**VER-23**	**Position (WGS84)**	115.2697, -34.2455
Slope	gentle	**Topography**	undulating plain
Soil colour	whitish	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Remnant roadside vegetation of Marri-Jarrah-Peppermint woodland, completely degraded.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, firebreak, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Completely Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	115	**Litter distribution**	under vegetation
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	10	**Litter cover (%)**	15
Grass cover (%)	90	**Herb cover (%)**	10

Site details			
Site	**VER-24**	**Position (WGS84)**	115.2695, -34.2395
Slope	negligible	**Topography**	undulating plain
Soil colour	whitish, yellow	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023
1	Foraging - nocturnal	10 Dec 2023	10 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Remnant roadside vegetation of Marri-Jarrah-Peppermint woodland. Vegetation consists of Jarrah and Marri over clusters of Peppermint, over understorey of young sedges, Kangaroo Paws and Acacias, over ground cover of grass, on yellowish loam substrate.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Completely Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	92	**Litter distribution**	under vegetation
Tree cover (%)	10	**Litter depth (cm)**	1.0
Shrub cover (%)	5	**Litter cover (%)**	5
Grass cover (%)	75	**Herb cover (%)**	2

Site details			
Site	**VER-25**	**Position (WGS84)**	115.2692, -34.2361
Slope	gentle	**Topography**	undulating plain
Soil colour	brown-grey, whitish	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023
1	Foraging - nocturnal	10 Dec 2023	10 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Pine plantation. Single row of planted Pinus sp. No understorey.			
Habitat	Pine plantation		
Disturbance	current operations, excavation, vehicle tracks, weed infestation		
Vegetation condition	Completely Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	102	**Litter distribution**	under vegetation
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	2	**Litter cover (%)**	15
Grass cover (%)	75	**Herb cover (%)**	20

Site details			
Site	**VER-26**	**Position (WGS84)**	115.2692, -34.2338
Slope	gentle	**Topography**	undulating plain
Soil colour	whitish, brown-grey	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023
1	Foraging - nocturnal	10 Dec 2023	10 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Pine plantation. Single row of planted Pinus sp. No understorey.			
Habitat	Pine plantation		
Disturbance	current operations, erosion channels, historic clearing, weed infestation		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	103	**Litter distribution**	under vegetation
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	3	**Litter cover (%)**	2
Grass cover (%)	85	**Herb cover (%)**	10

Site details			
Site	**VER-27**	**Position (WGS84)**	115.2690, -34.2290
Slope	gentle	**Topography**	undulating plain
Soil colour	whitish	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023
1	Foraging - nocturnal	10 Dec 2023	10 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Marri-Jarrah-Peppermint woodland. Jarrah and Marri trees, over midstorey of Allocasuarina and Peppermint trees, over understorey of Acacias, grass trees and younger Peppermint trees, over ground cover of grass.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, historic clearing, weed infestation, vehicle tracks		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	150	**Litter distribution**	even/continuous
Tree cover (%)	35	**Litter depth (cm)**	1.0
Shrub cover (%)	25	**Litter cover (%)**	25
Grass cover (%)	65	**Herb cover (%)**	25

Site details			
Site	**VER-28**	**Position (WGS84)**	115.2689, -34.2254
Slope	gentle	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023
1	Opportunistic sighting	08 Dec 2023	08 Dec 2023
1	Foraging - nocturnal	10 Dec 2023	10 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Remnant roadside Marri-Jarrah-Peppermint woodland, degraded. Jarrah and Marri trees, over midstorey of Peppermint trees, over Melaleucas and sedges, over grass ground cover.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, historic clearing, weed infestation, vehicle tracks		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	155	**Litter distribution**	even/continuous
Tree cover (%)	15	**Litter depth (cm)**	1.0
Shrub cover (%)	65	**Litter cover (%)**	10
Grass cover (%)	70	**Herb cover (%)**	5

Site details			
Site	**VER-29**	**Position (WGS84)**	115.2701, -34.1839
Slope	gentle	**Topography**	undulating plain
Soil colour	brown-grey	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023
1	Opportunistic sighting	08 Dec 2023	08 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Bluegum plantation with occasional Acacia sp. and sedges. Understorey is cleared with only grasses remaining.			
Habitat	Bluegum plantation		
Disturbance	current operations, erosion channels, evidence of feral animals, firebreak, historic clearing, weed infestation		
Vegetation condition	Completely Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	42	**Litter distribution**	under vegetation
Tree cover (%)	25	**Litter depth (cm)**	1.0
Shrub cover (%)	10	**Litter cover (%)**	15
Grass cover (%)	5	**Herb cover (%)**	2

Site details			
Site	**VER-30**	**Position (WGS84)**	115.2783, -34.1598
Slope	gentle	**Topography**	undulating plain
Soil colour	whitish	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023
1	Birding	08 Dec 2023	08 Dec 2023
1	Foraging - nocturnal	09 Dec 2023	09 Dec 2023
1	Opportunistic sighting	10 Dec 2023	10 Dec 2023
1	Foraging - vertebrates	08 Dec 2023	08 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Remnant roadside Marri-Jarrah-Peppermint woodland, degraded. Open Marri and Jarrah trees over Allocasuarina, Tea Tree, Acacia and sedges. Abundant leaf litter covers whitish loam substrate.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	vehicle tracks, weed infestation, erosion channels, historic clearing		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	85	**Litter distribution**	even/continuous
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	35	**Litter cover (%)**	80
Grass cover (%)	20	**Herb cover (%)**	10

Site details			
Site	**VER-31**	**Position (WGS84)**	115.3128, -34.1613
Slope	gentle	**Topography**	drainage line
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023
1	Birding	08 Dec 2023	08 Dec 2023
1	Foraging - nocturnal	09 Dec 2023	09 Dec 2023
1	Foraging - vertebrates	08 Dec 2023	08 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Remnant roadside Marri-Jarrah-Peppermint woodland, over road drain, but in good condition. Jarrah and Marri over dense shrubs of Melaleucas, Grass Trees, Hakeas and Acacias, over understorey is continuous of introduced grasses.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	190	**Litter distribution**	even/continuous
Tree cover (%)	20	**Litter depth (cm)**	2.0
Shrub cover (%)	70	**Litter cover (%)**	75
Grass cover (%)	80	**Herb cover (%)**	20

Site details			
Site	**VER-32**	**Position (WGS84)**	115.4017, -34.1569
Slope	gentle	**Topography**	undulating plain
Soil colour	whitish, grey	**Soil texture**	loam
Rock cover (%)	1	**Rock type**	granite - rocks

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023
1	Foraging - nocturnal	09 Dec 2023	09 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Marri-Jarrah-Peppermint woodland. Vegetation consists of Jarrah and Marri trees, over midstorey of Acacias, Grass Trees, Hakeas and Melaleucas, over grasses and herbs. Leaf litter continuous. At the intersection of 2 unsealed roads.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, historic clearing, litter, vehicle tracks, weed infestation		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	120	**Litter distribution**	even/continuous
Tree cover (%)	50	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	65
Grass cover (%)	20	**Herb cover (%)**	10

Site details			
Site	**VER-33**	**Position (WGS84)**	115.3028, -34.2296
Slope	negligible	**Topography**	drainage line
Soil colour	brown	**Soil texture**	loamy sand
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	08 Dec 2023	08 Dec 2023
1	Audio recording	08 Dec 2023	12 Dec 2023
1	Opportunistic sighting	08 Dec 2023	08 Dec 2023

Site description - visit 1 (08 Dec 2023)			
Seasonally inundated shrubland wetland. Large area of shallow, open water surrounded by relatively intact vegetation. Vegetation consists of occasional Eucalypt spp., over large Melaleucas (Paperbark), over large expanses of mixed sedges. Abundant frogs calling and few waterbirds present. Same vegetation complex as site AQU-47.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	current operations, historic clearing, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	95	**Litter distribution**	under vegetation
Tree cover (%)	25	**Litter depth (cm)**	0.0
Shrub cover (%)	55	**Litter cover (%)**	0
Grass cover (%)	10	**Herb cover (%)**	5

Site details			
Site	**VER-34**	**Position (WGS84)**	115.3057, -34.2472
Slope	negligible	**Topography**	drainage line
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	07 Dec 2023	07 Dec 2023
1	Opportunistic sighting	07 Dec 2023	07 Dec 2023

Site description - visit 1 (07 Dec 2023)			
Very good condition seasonally inundated Paperbark wetland. Paperbarks in the centre with sedges and isolated grass trees at the periphery. Aquatic plants present as well as a number of frog and breeding waterbird species. Same remnant as site AQU-07			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	67	**Litter distribution**	scattered
Tree cover (%)	35	**Litter depth (cm)**	1.0
Shrub cover (%)	15	**Litter cover (%)**	5
Grass cover (%)	15	**Herb cover (%)**	2

Site details			
Site	**VER-35**	**Position (WGS84)**	115.2975, -34.2308
Slope	negligible	**Topography**	drainage line
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	07 Dec 2023	07 Dec 2023
1	Birding	07 Dec 2023	07 Dec 2023
1	Foraging - vertebrates	07 Dec 2023	07 Dec 2023

Site description - visit 1 (07 Dec 2023)			
Large lake with limited midstorey that has been impacted by grazing. Remaining vegetation consists of Myrtaceae and Eucalypts trees, over occasional Melaleuca (Paperbark), over mixed sedges, and extensive paddock grasses almost continuous surrounding the lake. Same wetland as site AQU45.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-medium, historic clearing, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	110	**Litter distribution**	under vegetation
Tree cover (%)	25	**Litter depth (cm)**	1.0
Shrub cover (%)	30	**Litter cover (%)**	20
Grass cover (%)	50	**Herb cover (%)**	5

Site details			
Site	**VER-36**	**Position (WGS84)**	115.2886, -34.2170
Slope	negligible	**Topography**	drainage line
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	07 Dec 2023	07 Dec 2023
1	Birding	07 Dec 2023	07 Dec 2023
1	Foraging - vertebrates	07 Dec 2023	07 Dec 2023

Site description - visit 1 (07 Dec 2023)			
Seasonally inundated wetland. Vegetation consists of Melaleucas (Paperbarks) and Eucalypts, over Lepidosperma and other sedges, over grasses. Surrounded by paddocks. Remnant same as per site AQU-43.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, historic clearing, livestock tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	65	**Litter distribution**	none
Tree cover (%)	30	**Litter depth (cm)**	0.0
Shrub cover (%)	20	**Litter cover (%)**	0
Grass cover (%)	10	**Herb cover (%)**	5

Site details			
Site	**VER-37**	**Position (WGS84)**	115.2840, -34.2103
Slope	negligible	**Topography**	drainage line
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	07 Dec 2023	07 Dec 2023
1	Birding	07 Dec 2023	07 Dec 2023
1	Foraging - vertebrates	07 Dec 2023	07 Dec 2023

Site description - visit 1 (07 Dec 2023)			
Large sumpland. Vegetation largely intact in places, but also much disturbance and weed (grass) infestation, also disturbance from heavy waterbird roosting - highest density of waterbirds observed in a wetland to date. Vegetation consists of Myrtaceae trees over Melaleuca (Paperbarks), over grass and sedges at margin. Possibly perennially inundated. See also site AQU-34.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, historic clearing, weed infestation		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	112	**Litter distribution**	none
Tree cover (%)	20	**Litter depth (cm)**	0.0
Shrub cover (%)	2	**Litter cover (%)**	0
Grass cover (%)	90	**Herb cover (%)**	0

Site details			
Site	**VER-38**	**Position (WGS84)**	115.3038, -34.2511
Slope	gentle	**Topography**	drainage line
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	07 Dec 2023	07 Dec 2023
1	Opportunistic sighting	07 Dec 2023	07 Dec 2023

Site description - visit 1 (07 Dec 2023)			
Seasonally inundated Paperbark wetland, area surrounded by paddock. Large Melaleucas (Paperbark) and Peppermint trees, no midstorey, understorey of introduced grasses and weeds.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, livestock tracks, weed infestation		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	72	**Litter distribution**	under vegetation
Tree cover (%)	45	**Litter depth (cm)**	1.0
Shrub cover (%)	0	**Litter cover (%)**	0
Grass cover (%)	22	**Herb cover (%)**	5

Site details			
Site	**VER-39**	**Position (WGS84)**	115.3021, -34.2563
Slope	negligible	**Topography**	drainage line
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	07 Dec 2023	07 Dec 2023
1	Birding	07 Dec 2023	07 Dec 2023
1	Foraging - vertebrates	07 Dec 2023	07 Dec 2023

Site description - visit 1 (07 Dec 2023)			
Large lake. Vegetation consists of peppermint trees around the northern and western perimeter, a stand of Melaleuca (Paperbark) in the middle and sedges on the eastern side. Site highly impacted by grazing livestock with tracks under tree stands and at waters edge. Despite this impact, many different waterbirds present and ticking Frogs present. Possibly perennially inundated. See also site AQU-40.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	current operations, grazing-high, historic clearing, livestock tracks, weed infestation		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	95	**Litter distribution**	under vegetation
Tree cover (%)	40	**Litter depth (cm)**	1.0
Shrub cover (%)	0	**Litter cover (%)**	5
Grass cover (%)	50	**Herb cover (%)**	5

Site details			
Site	**VER-40**	**Position (WGS84)**	115.3051, -34.2757
Slope	gentle	**Topography**	drainage line
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	07 Dec 2023	07 Dec 2023
1	Audio recording	07 Dec 2023	11 Dec 2023
1	Birding	07 Dec 2023	07 Dec 2023
1	Foraging - vertebrates	07 Dec 2023	07 Dec 2023

Site description - visit 1 (07 Dec 2023)			
Scott River riparian zone. Melaleucas Paperbark trees, over younger Melaleucas, over Grass Trees and Lepidosperma and other sedges, over infestation of grasses and introduced weeds.			
Habitat	Riparian zone (outside mapped extent)		
Disturbance	erosion channels, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	117	**Litter distribution**	under vegetation
Tree cover (%)	35	**Litter depth (cm)**	1.0
Shrub cover (%)	60	**Litter cover (%)**	20
Grass cover (%)	20	**Herb cover (%)**	2

Site details			
Site	**VER-41**	**Position (WGS84)**	115.2922, -34.2756
Slope	gentle	**Topography**	drainage line
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Audio recording	07 Dec 2023	11 Dec 2023
1	Site description	07 Dec 2023	07 Dec 2023
1	Opportunistic sighting	07 Dec 2023	07 Dec 2023

Site description - visit 1 (07 Dec 2023)			
Scott River riparian zone. Large Jarrah and Marri trees, over Peppermint trees, open middle storey, over Lepidosperma and other sedges, over grasses, on loam substrate.			
Habitat	Riparian zone (outside mapped extent)		
Disturbance	erosion channels, grazing-low, historic clearing		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	120	**Litter distribution**	under vegetation
Tree cover (%)	30	**Litter depth (cm)**	1.0
Shrub cover (%)	15	**Litter cover (%)**	10
Grass cover (%)	70	**Herb cover (%)**	5

Site details			
Site	**VER-42**	**Position (WGS84)**	115.3021, -34.2769
Slope	moderate	**Topography**	drainage line
Soil colour	grey	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	07 Dec 2023	07 Dec 2023
1	Birding	07 Dec 2023	07 Dec 2023
1	Foraging - vertebrates	07 Dec 2023	07 Dec 2023
1	Audio recording	07 Dec 2023	11 Dec 2023

Site description - visit 1 (07 Dec 2023)			
Scott River riparian zone. Melaleucas Paperbark trees, over younger Melaleucas, over Grass Trees and Lepidosperma and other sedges, over infestation of grasses and introduced weeds.			
Habitat	Riparian zone (outside mapped extent)		
Disturbance	current operations, historic clearing, vehicle tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	75	**Litter distribution**	scattered
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	15	**Litter cover (%)**	30
Grass cover (%)	30	**Herb cover (%)**	10

Site details			
Site	**VER-43**	**Position (WGS84)**	115.3099, -34.2187
Slope	gentle	**Topography**	undulating plain
Soil colour	grey	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	none

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	06 Dec 2023	06 Dec 2023
1	Ultrasonic recording	06 Dec 2023	11 Dec 2023

Site description - visit 1 (06 Dec 2023)			
Seasonally inundated sedgeland. Occasional Melaleucas (Paperbarks) over stands of Tea Tree, over Lepidosperma and other sedges, over grasses, on loam substrate. Surrounded by plantation.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	weed infestation, vehicle tracks, historic clearing		
Vegetation condition	Degraded	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	140	**Litter distribution**	even/continuous
Tree cover (%)	15	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	60
Grass cover (%)	65	**Herb cover (%)**	20

Site details			
Site	**VER-44**	**Position (WGS84)**	115.2671, -34.2007
Slope	gentle	**Topography**	drainage line
Soil colour	brown-grey	**Soil texture**	loam
Rock cover (%)	1	**Rock type**	laterite

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	06 Dec 2023	06 Dec 2023
1	Ultrasonic recording	06 Dec 2023	11 Dec 2023
1	Opportunistic sighting	06 Dec 2023	06 Dec 2023

Site description - visit 1 (06 Dec 2023)			
Remnant roadside vegetation of Marri-Jarrah-Peppermint woodland, receiving drainage. Vegetation consists of Jarrah, Marri and Peppermint trees, over and Melaleucas species, over younger Melaleucas, Lepidosperma and other sedges, on moist loam soils.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	75	**Litter distribution**	even/continuous
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	40	**Litter cover (%)**	10
Grass cover (%)	10	**Herb cover (%)**	5

Site details			
Site	**VER-45**	**Position (WGS84)**	115.2838, -34.1754
Slope	gentle	**Topography**	undulating plain
Soil colour	grey	**Soil texture**	loam
Rock cover (%)	1	**Rock type**	laterite

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	06 Dec 2023	06 Dec 2023
1	Opportunistic sighting	06 Dec 2023	06 Dec 2023

Site description - visit 1 (06 Dec 2023)			
Seasonally inundated shrubland. Longitudinal sumpland surrounded by remnant vegetation. Vegetation consists of occasional Melaleuca (Paperbark) trees, over mixed shrubs and sedges. Site was burnt-off in Spring 2024 by owner. See also site AQU-25.			
Habitat	Seasonally inundated shrubland (wetland)		
Disturbance	current operations, grazing-low, livestock tracks		
Vegetation condition	Good	**Fire age**	recent (1 year)
Total veg. cover (%)	82	**Litter distribution**	none
Tree cover (%)	5	**Litter depth (cm)**	1.0
Shrub cover (%)	70	**Litter cover (%)**	5
Grass cover (%)	5	**Herb cover (%)**	2

Site details			
Site	**VER-46**	**Position (WGS84)**	115.2803, -34.1743
Slope	gentle	**Topography**	undulating plain
Soil colour	brown	**Soil texture**	sandy loam
Rock cover (%)	1	**Rock type**	laterite

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	06 Dec 2023	06 Dec 2023
1	Ultrasonic recording	06 Dec 2023	11 Dec 2023
1	Birding	10 Dec 2023	10 Dec 2023
1	Foraging - vertebrates	10 Dec 2023	10 Dec 2023

Site description - visit 1 (06 Dec 2023)			
Marri-Jarrah-Peppermint woodland. Overstorey of Jarrah and Allocasuarina and Jarrah trees, over Grass Trees, over sedges and Acacias. Continuous leaf litter atop sandy loam substrate. Site was burnt-off in Spring 2024 by owner.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	current operations, firebreak, grazing-medium, livestock tracks, vehicle tracks		
Vegetation condition	Good	**Fire age**	recent (1 year)
Total veg. cover (%)	90	**Litter distribution**	even/continuous
Tree cover (%)	40	**Litter depth (cm)**	1.0
Shrub cover (%)	35	**Litter cover (%)**	80
Grass cover (%)	10	**Herb cover (%)**	5

Site details			
Site	**VER-47**	**Position (WGS84)**	115.2900, -34.1783
Slope	gentle	**Topography**	undulating plain
Soil colour	brown-grey	**Soil texture**	loam
Rock cover (%)	1	**Rock type**	laterite

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	06 Dec 2023	06 Dec 2023
1	Opportunistic sighting	06 Dec 2023	06 Dec 2023

Site description - visit 1 (06 Dec 2023)			
Seasonally inundated sedgeland. Occasional, large Melaleucas (Paperbark) at margins. Dense cover of Lepidosperma and other sedges on loam substrate. Site was burnt-off in Spring 2024 by owner.			
Habitat	Seasonally inundated sedgeland (wetland)		
Disturbance	weed infestation		
Vegetation condition	Good	**Fire age**	recent (1 year)
Total veg. cover (%)	111	**Litter distribution**	even/continuous
Tree cover (%)	15	**Litter depth (cm)**	1.0
Shrub cover (%)	90	**Litter cover (%)**	80
Grass cover (%)	2	**Herb cover (%)**	4

Site details			
Site	**VER-48**	**Position (WGS84)**	115.2944, -34.1765
Slope	gentle	**Topography**	undulating plain
Soil colour	grey	**Soil texture**	sandy loam
Rock cover (%)	1	**Rock type**	laterite

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	06 Dec 2023	06 Dec 2023
1	Opportunistic sighting	06 Dec 2023	06 Dec 2023
1	Foraging - nocturnal	11 Dec 2023	11 Dec 2023

Site description - visit 1 (06 Dec 2023)			
Marri-Jarrah-Peppermint woodland. Overstorey of Jarrah and Allocasuarina and Jarrah trees, over Grass Trees, over sedges and Acacias. Continuous leaf litter atop sandy loam substrate. Site was burnt-off in Spring 2024 by owner.			
Habitat	Marri-Jarrah-Peppermint woodland		
Disturbance	erosion channels, firebreak, large-scale clearing, livestock tracks, vehicle tracks, weed infestation		
Vegetation condition	Good	**Fire age**	recent (1 year)
Total veg. cover (%)	97	**Litter distribution**	scattered
Tree cover (%)	20	**Litter depth (cm)**	1.0
Shrub cover (%)	70	**Litter cover (%)**	25
Grass cover (%)	5	**Herb cover (%)**	2

Site details			
Site	**VER-49**	**Position (WGS84)**	115.2848, -34.1832
Slope	negligible	**Topography**	undulating plain
Soil colour	grey	**Soil texture**	sandy loam
Rock cover (%)	1	**Rock type**	laterite

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Site description	06 Dec 2023	06 Dec 2023
1	Birding	06 Dec 2023	06 Dec 2023
1	Foraging - vertebrates	06 Dec 2023	06 Dec 2023

Site description - visit 1 (06 Dec 2023)			
Seasonally inundated Paperbark woodland. Large Melaleucas (Paperbark), over Melaleuca saplings, Lepidosperma and other sedges, on moist loamy substrate.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	grazing-medium, livestock tracks, large-scale clearing, vehicle tracks, weed infestation		
Vegetation condition	Good	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	87	**Litter distribution**	even/continuous
Tree cover (%)	15	**Litter depth (cm)**	2.0
Shrub cover (%)	60	**Litter cover (%)**	85
Grass cover (%)	10	**Herb cover (%)**	2

Site details			
Site	**Wetland01**	**Position (WGS84)**	115.3027, -34.2522
Slope	negligible	**Topography**	seasonally wet area
Soil colour	grey	**Soil texture**	sandy loam
Rock cover (%)	0	**Rock type**	laterite

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Birding	28 Nov 2024	28 Nov 2024
1	Site description	28 Nov 2024	28 Nov 2024

Site description - visit 1 (28 Nov 2024)			
Seasonally inundated Paperbark wetland. Vegetation consists of large Melaleucas (Paperbark) and scattered she-oak, over Melaleuca saplings and sedges. Many large logs and debris present, as well as perches for waterbirds. See also sites AQU-06 and VER-38.			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	grazing-medium, livestock tracks, large-scale clearing, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	107	**Litter distribution**	under vegetation
Tree cover (%)	95	**Litter depth (cm)**	1.0
Shrub cover (%)	2	**Litter cover (%)**	2
Grass cover (%)	10	**Herb cover (%)**	0

Site details			
Site	**Wetland03**	**Position (WGS84)**	115.2816, -34.1803
Slope	negligible	**Topography**	seasonally wet area
Soil colour	grey	**Soil texture**	sandy loam
Rock cover (%)	0	**Rock type**	laterite

Sample and effort summary			
Visit	**Sample method**	**Date start**	**Date stop**
1	Birding	05 Dec 2024	05 Dec 2024
1	Site description	05 Dec 2024	05 Dec 2024

Site description - visit 1 (05 Dec 2024)			
Seasonally inundated Paperbark and shrubland wetland, surrounded by paddock. Melaleuca fringing and shrubs and sedges internally. Condition varies, as stock are accessing it, particularly on western side. See also site AQU-015			
Habitat	Seasonally inundated paperbark woodland (wetland)		
Disturbance	grazing-medium, livestock tracks, large-scale clearing, weed infestation		
Vegetation condition	Excellent	**Fire age**	long-unburnt (>10 years)
Total veg. cover (%)	110	**Litter distribution**	under vegetation
Tree cover (%)	50	**Litter depth (cm)**	1.0
Shrub cover (%)	50	**Litter cover (%)**	2
Grass cover (%)	10	**Herb cover (%)**	0

Appendix 3 Survey site locations from BBRAS (Phoenix 2025a)

Site name	Sample method	Date start	Date stop	Latitude	Longitude
BUS001	Audio recording	14/08/2023 17:15	15/08/2023 7:15	-34.224836	115.269157
BUS001	Audio recording	18/11/2023 18:32	19/11/2023 5:36	-34.224587	115.269442
BUS001	Audio recording	11/01/2024 19:05	14/01/2024 5:40	-34.224666	115.269155
BUS001	Opportunistic sighting	24/05/2023 15:55	24/05/2023 15:55	-34.224656	115.269168
BUS001	Opportunistic sighting	24/05/2023 15:55	24/05/2023 15:55	-34.224656	115.269168
BUS001	Opportunistic sighting	25/05/2023 7:00	25/05/2023 7:00	-34.224656	115.269168
BUS001	Site description	24/05/2023 16:12	24/05/2023 16:12	-34.224656	115.269168
BUS001	Ultrasonic recording	24/05/2023 16:50	25/05/2023 7:34	-34.224656	115.269168
BUS001	Ultrasonic recording	14/08/2023 17:15	15/08/2023 7:15	-34.224836	115.269157
BUS001	Ultrasonic recording	18/11/2023 18:33	19/11/2023 5:36	-34.22459	115.269424
BUS001	Ultrasonic recording	11/01/2024 19:05	14/01/2024 5:40	-34.224669	115.269178
BUS001	Wind farm point count	24/05/2023 15:40	24/05/2023 16:10	-34.224657	115.269165
BUS001	Wind farm point count	25/05/2023 8:00	25/05/2023 8:30	-34.224657	115.269165
BUS001	Wind farm point count	14/08/2023 9:35	14/08/2023 10:05	-34.224657	115.269165
BUS001	Wind farm point count	15/08/2023 12:05	15/08/2023 12:35	-34.224657	115.269165
BUS001	Wind farm point count	17/11/2023 7:30	17/11/2023 8:00	-34.224657	115.269165
BUS001	Wind farm point count	18/11/2023 15:45	18/11/2023 16:15	-34.224657	115.269165
BUS001	Wind farm point count	10/01/2024 14:50	10/01/2024 15:20	-34.224657	115.269165
BUS001	Wind farm point count	11/01/2024 10:45	11/01/2024 11:15	-34.224657	115.269165
BUS002	Audio recording	14/08/2023 17:15	15/08/2023 7:15	-34.261064	115.300137
BUS002	Audio recording	17/11/2023 18:32	18/11/2023 5:36	-34.260641	115.300421
BUS002	Audio recording	11/01/2024 19:05	14/01/2024 5:40	-34.260677	115.300558
BUS002	Site description	25/05/2023 14:26	25/05/2023 14:26	-34.261125	115.300098
BUS002	Ultrasonic recording	25/05/2023 16:50	26/05/2023 7:34	-34.261317	115.300227
BUS002	Ultrasonic recording	14/08/2023 17:15	15/08/2023 7:15	-34.261053	115.300123
BUS002	Ultrasonic recording	17/11/2023 18:33	18/11/2023 5:36	-34.260651	115.300431
BUS002	Ultrasonic recording	11/01/2024 19:05	14/01/2024 5:40	-34.260661	115.300538
BUS002	Wind farm point count	25/05/2023 14:00	25/05/2023 14:30	-34.26111	115.300091
BUS002	Wind farm point count	26/05/2023 12:00	26/05/2023 12:30	-34.26111	115.300091
BUS002	Wind farm point count	14/08/2023 11:50	14/08/2023 12:20	-34.26111	115.300091
BUS002	Wind farm point count	15/08/2023 14:20	15/08/2023 14:50	-34.26111	115.300091
BUS002	Wind farm point count	17/11/2023 14:00	17/11/2023 14:30	-34.26111	115.300091
BUS002	Wind farm point count	18/11/2023 8:25	18/11/2023 8:55	-34.26111	115.300091
BUS002	Wind farm point count	10/01/2024 7:40	10/01/2024 8:10	-34.26111	115.300091
BUS002	Wind farm point count	11/01/2024 12:10	11/01/2024 12:40	-34.26111	115.300091
BUS003	Audio recording	15/08/2023 17:15	16/08/2023 7:15	-34.238023	115.278846
BUS003	Audio recording	18/11/2023 18:32	19/11/2023 5:36	-34.238376	115.279251
BUS003	Audio recording	10/01/2024 19:05	11/01/2024 5:40	-34.238144	115.279125
BUS003	Opportunistic sighting	19/11/2023 10:15	19/11/2023 10:15	-34.237911	115.278841
BUS003	Site description	25/05/2023 16:14	25/05/2023 16:14	-34.238051	115.278826
BUS003	Ultrasonic recording	25/05/2023 16:50	26/05/2023 7:34	-34.238051	115.278826
BUS003	Ultrasonic recording	15/08/2023 17:15	16/08/2023 7:15	-34.237992	115.278855

Site name	Sample method	Date start	Date stop	Latitude	Longitude
BUS003	Ultrasonic recording	18/11/2023 18:33	19/11/2023 5:36	-34.238392	115.279246
BUS003	Ultrasonic recording	10/01/2024 19:05	11/01/2024 5:40	-34.238142	115.279122
BUS003	Wind farm point count	25/05/2023 16:05	25/05/2023 16:35	-34.238051	115.278826
BUS003	Wind farm point count	26/05/2023 10:30	26/05/2023 11:00	-34.238051	115.278826
BUS003	Wind farm point count	15/08/2023 11:10	15/08/2023 11:40	-34.238051	115.278826
BUS003	Wind farm point count	16/08/2023 9:40	16/08/2023 10:10	-34.238051	115.278826
BUS003	Wind farm point count	17/11/2023 10:55	17/11/2023 11:25	-34.238051	115.278826
BUS003	Wind farm point count	18/11/2023 15:00	18/11/2023 15:30	-34.238051	115.278826
BUS003	Wind farm point count	10/01/2024 10:25	10/01/2024 10:55	-34.238051	115.278826
BUS003	Wind farm point count	11/01/2024 13:30	11/01/2024 14:00	-34.238051	115.278826
BUS004	Audio recording	18/11/2023 18:32	19/11/2023 5:36	-34.224579	115.307057
BUS004	Audio recording	10/01/2024 19:05	11/01/2024 5:40	-34.224284	115.306511
BUS004	Site description	26/05/2023 8:04	26/05/2023 8:04	-34.224312	115.306603
BUS004	Ultrasonic recording	25/05/2023 16:50	26/05/2023 7:34	-34.2243	115.306692
BUS004	Ultrasonic recording	18/11/2023 18:33	19/11/2023 5:36	-34.224582	115.307064
BUS004	Ultrasonic recording	10/01/2024 19:05	11/01/2024 5:40	-34.224256	115.306498
BUS004	Wind farm point count	26/05/2023 8:00	26/05/2023 8:30	-34.224281	115.306663
BUS004	Wind farm point count	26/05/2023 13:50	26/05/2023 14:20	-34.224281	115.306663
BUS004	Wind farm point count	16/08/2023 12:50	16/08/2023 13:20	-34.224281	115.306663
BUS004	Wind farm point count	17/11/2023 9:45	17/11/2023 10:15	-34.224281	115.306663
BUS004	Wind farm point count	18/11/2023 13:40	18/11/2023 14:10	-34.224281	115.306663
BUS004	Wind farm point count	10/01/2024 13:20	10/01/2024 13:50	-34.224281	115.306663
BUS004	Wind farm point count	11/01/2024 7:10	11/01/2024 7:40	-34.224281	115.306663
BUS005	Audio recording	18/11/2023 18:32	19/11/2023 5:36	-34.215572	115.293678
BUS005	Audio recording	10/01/2024 19:05	11/01/2024 5:40	-34.215309	115.294031
BUS005	Opportunistic sighting	26/05/2023 9:09	26/05/2023 9:09	-34.215565	115.293356
BUS005	Site description	26/05/2023 9:00	26/05/2023 9:00	-34.215623	115.293356
BUS005	Ultrasonic recording	25/05/2023 16:50	26/05/2023 7:34	-34.215471	115.293463
BUS005	Ultrasonic recording	18/11/2023 18:33	19/11/2023 5:36	-34.215547	115.293708
BUS005	Ultrasonic recording	10/01/2024 19:05	11/01/2024 5:40	-34.21531	115.294031
BUS005	Wind farm point count	26/05/2023 8:40	26/05/2023 9:10	-34.21547	115.293463
BUS005	Wind farm point count	26/05/2023 14:25	26/05/2023 14:55	-34.21547	115.293463
BUS005	Wind farm point count	16/08/2023 12:15	16/08/2023 12:45	-34.21547	115.293463
BUS005	Wind farm point count	17/11/2023 9:10	17/11/2023 9:40	-34.21547	115.293463
BUS005	Wind farm point count	18/11/2023 13:10	18/11/2023 13:40	-34.21547	115.293463
BUS005	Wind farm point count	10/01/2024 13:55	10/01/2024 14:25	-34.21547	115.293463
BUS005	Wind farm point count	11/01/2024 7:15	11/01/2024 7:45	-34.21547	115.293463
BUS006	Audio recording	14/08/2023 17:15	15/08/2023 7:15	-34.181645	115.278547
BUS006	Audio recording	18/11/2023 18:32	19/11/2023 5:36	-34.181654	115.278548
BUS006	Audio recording	11/01/2024 19:05	14/01/2024 5:40	-34.181989	115.278569
BUS006	Site description	25/05/2023 12:12	25/05/2023 12:12	-34.181184	115.278227
BUS006	Ultrasonic recording	25/05/2023 16:50	28/05/2023 7:34	-34.18134	115.278576
BUS006	Ultrasonic recording	14/08/2023 17:15	15/08/2023 7:15	-34.181645	115.278542

Site name	Sample method	Date start	Date stop	Latitude	Longitude
BUS006	Ultrasonic recording	18/11/2023 18:33	19/11/2023 5:36	-34.181647	115.278548
BUS006	Ultrasonic recording	11/01/2024 19:05	14/01/2024 5:40	-34.181994	115.278561
BUS006	Wind farm point count	25/05/2023 12:00	25/05/2023 12:30	-34.181171	115.278206
BUS006	Wind farm point count	26/05/2023 15:25	26/05/2023 15:55	-34.181171	115.278206
BUS006	Wind farm point count	14/08/2023 8:15	14/08/2023 8:45	-34.181171	115.278206
BUS006	Wind farm point count	15/08/2023 12:40	15/08/2023 13:10	-34.181171	115.278206
BUS006	Wind farm point count	17/11/2023 8:10	17/11/2023 8:40	-34.181171	115.278206
BUS006	Wind farm point count	18/11/2023 16:50	18/11/2023 17:20	-34.181171	115.278206
BUS006	Wind farm point count	11/01/2024 16:10	11/01/2024 16:40	-34.181171	115.278206
BUS006	Wind farm point count	12/01/2024 8:30	12/01/2024 9:00	-34.181171	115.278206
BUS007	Audio recording	15/08/2023 17:15	16/08/2023 7:15	-34.238732	115.294219
BUS007	Audio recording	18/11/2023 18:32	19/11/2023 5:36	-34.238226	115.289054
BUS007	Audio recording	10/01/2024 19:05	11/01/2024 5:40	-34.238533	115.289353
BUS007	Site description	25/05/2023 15:38	25/05/2023 15:38	-34.23795	115.289198
BUS007	Ultrasonic recording	25/05/2023 16:50	26/05/2023 7:34	-34.23795	115.289198
BUS007	Ultrasonic recording	15/08/2023 17:15	16/08/2023 7:15	-34.238732	115.294219
BUS007	Ultrasonic recording	18/11/2023 18:33	19/11/2023 5:36	-34.238197	115.289072
BUS007	Ultrasonic recording	10/01/2024 19:05	11/01/2024 5:40	-34.238493	115.289364
BUS007	Wind farm point count	25/05/2023 15:25	25/05/2023 15:55	-34.237961	115.289201
BUS007	Wind farm point count	26/05/2023 9:45	26/05/2023 10:15	-34.237961	115.289201
BUS007	Wind farm point count	15/08/2023 10:15	15/08/2023 10:45	-34.237961	115.289201
BUS007	Wind farm point count	16/08/2023 8:50	16/08/2023 9:20	-34.237961	115.289201
BUS007	Wind farm point count	17/11/2023 11:45	17/11/2023 12:15	-34.237961	115.289201
BUS007	Wind farm point count	18/11/2023 14:25	18/11/2023 14:55	-34.237961	115.289201
BUS007	Wind farm point count	10/01/2024 9:30	10/01/2024 10:00	-34.237961	115.289201
BUS007	Wind farm point count	11/01/2024 14:05	11/01/2024 14:35	-34.237961	115.289201
BUS008	Audio recording	15/08/2023 17:15	16/08/2023 7:15	-34.192899	115.319341
BUS008	Audio recording	17/11/2023 18:32	18/11/2023 5:36	-34.192701	115.30771
BUS008	Audio recording	10/01/2024 19:05	11/01/2024 5:40	-34.19271	115.307494
BUS008	Opportunistic sighting	24/05/2023 14:25	24/05/2023 14:25	-34.192733	115.308016
BUS008	Site description	24/05/2023 14:14	24/05/2023 14:14	-34.192733	115.308016
BUS008	Ultrasonic recording	24/05/2023 16:50	25/05/2023 7:34	-34.192839	115.308422
BUS008	Ultrasonic recording	15/08/2023 17:15	16/08/2023 7:15	-34.1929	115.319348
BUS008	Ultrasonic recording	17/11/2023 18:33	18/11/2023 17:36	-34.192705	115.307511
BUS008	Ultrasonic recording	10/01/2024 19:05	11/01/2024 5:40	-34.192707	115.307492
BUS008	Wind farm point count	24/05/2023 14:10	24/05/2023 14:40	-34.192733	115.308016
BUS008	Wind farm point count	25/05/2023 10:10	25/05/2023 10:40	-34.192733	115.308016
BUS008	Wind farm point count	14/08/2023 13:40	14/08/2023 14:10	-34.192733	115.308016
BUS008	Wind farm point count	15/08/2023 7:40	15/08/2023 8:10	-34.192733	115.308016
BUS008	Wind farm point count	10/01/2024 12:35	10/01/2024 13:05	-34.192733	115.308016
BUS008	Wind farm point count	11/01/2024 8:40	11/01/2024 9:10	-34.192733	115.308016
BUS009	Audio recording	17/11/2023 18:32	18/11/2023 5:36	-34.198813	115.300214
BUS009	Audio recording	10/01/2024 19:05	11/01/2024 5:40	-34.198872	115.300169

Site name	Sample method	Date start	Date stop	Latitude	Longitude
BUS009	Opportunistic sighting	25/05/2023 9:45	25/05/2023 9:45	-34.198939	115.300079
BUS009	Site description	24/05/2023 13:44	24/05/2023 13:44	-34.198943	115.300078
BUS009	Ultrasonic recording	24/05/2023 16:50	25/05/2023 7:34	-34.198706	115.299879
BUS009	Ultrasonic recording	17/11/2023 18:33	18/11/2023 5:35	-34.198988	115.300124
BUS009	Ultrasonic recording	10/01/2024 19:05	11/01/2024 5:40	-34.198881	115.300176
BUS009	Wind farm point count	24/05/2023 13:30	24/05/2023 14:00	-34.198943	115.300078
BUS009	Wind farm point count	25/05/2023 9:30	25/05/2023 10:00	-34.198943	115.300078
BUS009	Wind farm point count	17/11/2023 17:05	17/11/2023 17:35	-34.198943	115.300078
BUS009	Wind farm point count	18/11/2023 10:25	18/11/2023 10:55	-34.198943	115.300078
BUS009	Wind farm point count	10/01/2024 12:00	10/01/2024 12:30	-34.198943	115.300078
BUS009	Wind farm point count	11/01/2024 9:15	11/01/2024 9:45	-34.198943	115.300078
BUS010	Audio recording	15/08/2023 17:15	16/08/2023 7:15	-34.240178	115.301981
BUS010	Audio recording	17/11/2023 18:33	18/11/2023 5:36	-34.240181	115.302126
BUS010	Audio recording	10/01/2024 19:05	11/01/2024 5:40	-34.240207	115.302121
BUS010	Site description	25/05/2023 15:02	25/05/2023 15:02	-34.24018	115.301988
BUS010	Ultrasonic recording	25/05/2023 16:50	26/05/2023 7:34	-34.24018	115.301988
BUS010	Ultrasonic recording	15/08/2023 17:15	16/08/2023 7:15	-34.240178	115.301981
BUS010	Ultrasonic recording	17/11/2023 18:33	18/11/2023 5:36	-34.240166	115.302042
BUS010	Ultrasonic recording	10/01/2024 19:05	11/01/2024 5:40	-34.240207	115.302121
BUS010	Wind farm point count	25/05/2023 14:50	25/05/2023 15:20	-34.240181	115.301992
BUS010	Wind farm point count	26/05/2023 11:15	26/05/2023 11:45	-34.240181	115.301992
BUS010	Wind farm point count	14/08/2023 15:35	14/08/2023 16:05	-34.240181	115.301992
BUS010	Wind farm point count	15/08/2023 9:40	15/08/2023 10:10	-34.240181	115.301992
BUS010	Wind farm point count	17/11/2023 16:25	17/11/2023 16:55	-34.240181	115.301992
BUS010	Wind farm point count	18/11/2023 9:40	18/11/2023 10:10	-34.240181	115.301992
BUS010	Wind farm point count	10/01/2024 11:10	10/01/2024 11:40	-34.240181	115.301992
BUS010	Wind farm point count	11/01/2024 12:50	11/01/2024 13:20	-34.240181	115.301992
BUS011	Audio recording	14/08/2023 17:15	15/08/2023 7:15	-34.250675	115.295853
BUS011	Audio recording	17/11/2023 18:32	18/11/2023 17:36	-34.250865	115.295574
BUS011	Audio recording	11/01/2024 19:05	14/01/2024 5:40	-34.250282	115.296521
BUS011	Opportunistic sighting	24/05/2023 16:40	24/05/2023 16:40	-34.250737	115.295831
BUS011	Site description	24/05/2023 16:31	24/05/2023 16:31	-34.250737	115.295831
BUS011	Ultrasonic recording	24/05/2023 16:50	25/05/2023 7:34	-34.250867	115.29557
BUS011	Ultrasonic recording	14/08/2023 17:15	15/08/2023 7:15	-34.250675	115.295853
BUS011	Ultrasonic recording	17/11/2023 18:33	18/11/2023 5:36	-34.250832	115.295817
BUS011	Ultrasonic recording	11/01/2024 19:05	14/01/2024 5:40	-34.250309	115.296487
BUS011	Wind farm point count	24/05/2023 16:25	24/05/2023 16:55	-34.250741	115.29583
BUS011	Wind farm point count	25/05/2023 8:35	25/05/2023 9:05	-34.250741	115.29583
BUS011	Wind farm point count	14/08/2023 11:05	14/08/2023 11:35	-34.250741	115.29583
BUS011	Wind farm point count	15/08/2023 15:00	15/08/2023 15:30	-34.250741	115.29583
BUS011	Wind farm point count	17/11/2023 14:25	17/11/2023 14:55	-34.250741	115.29583
BUS011	Wind farm point count	10/01/2024 8:50	10/01/2024 9:20	-34.250741	115.29583
BUS011	Wind farm point count	11/01/2024 14:40	11/01/2024 15:10	-34.250741	115.29583

Site name	Sample method	Date start	Date stop	Latitude	Longitude
BUS012	Audio recording	15/08/2023 17:15	16/08/2023 7:15	-34.259845	115.325214
BUS012	Site description	14/08/2023 14:43	14/08/2023 14:43	-34.259875	115.325178
BUS012	Ultrasonic recording	15/08/2023 17:15	16/08/2023 7:15	-34.259845	115.325214
BUS012	Wind farm point count	14/08/2023 14:40	14/08/2023 15:10	-34.259822	115.325095
BUS012	Wind farm point count	15/08/2023 8:55	15/08/2023 9:25	-34.259822	115.325095
BUS013	Audio recording	14/08/2023 17:15	15/08/2023 7:15	-34.206563	115.255239
BUS013	Audio recording	18/11/2023 18:32	19/11/2023 5:36	-34.206755	115.255316
BUS013	Audio recording	11/01/2024 19:05	14/01/2024 5:40	-34.206563	115.255167
BUS013	Opportunistic sighting	24/05/2023 10:42	24/05/2023 10:42	-34.20639	115.255177
BUS013	Site description	24/05/2023 17:11	24/05/2023 17:11	-34.206384	115.255201
BUS013	Ultrasonic recording	24/05/2023 16:50	25/05/2023 7:34	-34.206385	115.255202
BUS013	Ultrasonic recording	14/08/2023 17:15	15/08/2023 7:15	-34.206563	115.255239
BUS013	Ultrasonic recording	18/11/2023 18:33	19/11/2023 5:36	-34.206756	115.255316
BUS013	Ultrasonic recording	11/01/2024 19:05	14/01/2024 5:40	-34.206546	115.255166
BUS013	Wind farm point count	24/05/2023 10:05	24/05/2023 10:35	-34.206389	115.255177
BUS013	Wind farm point count	25/05/2023 7:20	25/05/2023 7:50	-34.206389	115.255177
BUS013	Wind farm point count	14/08/2023 8:50	14/08/2023 9:20	-34.206389	115.255177
BUS013	Wind farm point count	15/08/2023 13:30	15/08/2023 14:00	-34.206389	115.255177
BUS013	Wind farm point count	17/11/2023 6:52	17/11/2023 7:22	-34.206389	115.255177
BUS013	Wind farm point count	18/11/2023 16:15	18/11/2023 16:45	-34.206389	115.255177
BUS013	Wind farm point count	10/01/2024 15:25	10/01/2024 15:55	-34.206389	115.255177
BUS013	Wind farm point count	11/01/2024 10:10	11/01/2024 10:40	-34.206389	115.255177
BUS014	Audio recording	14/08/2023 17:15	15/08/2023 7:15	-34.160859	115.312204
BUS014	Audio recording	19/11/2023 18:32	20/11/2023 5:36	-34.160572	115.312601
BUS014	Audio recording	11/01/2024 19:05	14/01/2024 5:40	-34.160746	115.312496
BUS014	Opportunistic sighting	24/05/2023 15:15	24/05/2023 15:15	-34.160783	115.312351
BUS014	Site description	24/05/2023 15:14	24/05/2023 15:14	-34.160783	115.312351
BUS014	Ultrasonic recording	24/05/2023 16:50	25/05/2023 7:34	-34.160783	115.312351
BUS014	Ultrasonic recording	14/08/2023 17:15	15/08/2023 7:15	-34.160827	115.312199
BUS014	Ultrasonic recording	19/11/2023 18:33	20/11/2023 5:36	-34.160572	115.312255
BUS014	Ultrasonic recording	11/01/2024 19:05	14/01/2024 5:40	-34.160746	115.312496
BUS014	Wind farm point count	24/05/2023 15:00	24/05/2023 15:30	-34.160777	115.312345
BUS014	Wind farm point count	25/05/2023 10:55	25/05/2023 11:25	-34.160777	115.312345
BUS014	Wind farm point count	14/08/2023 12:35	14/08/2023 13:05	-34.160777	115.312345
BUS014	Wind farm point count	15/08/2023 8:10	15/08/2023 8:40	-34.160777	115.312345
BUS014	Wind farm point count	18/11/2023 12:00	18/11/2023 12:30	-34.160777	115.312345
BUS014	Wind farm point count	19/11/2023 8:15	19/11/2023 8:45	-34.160777	115.312345
BUS014	Wind farm point count	11/01/2024 15:15	11/01/2024 15:45	-34.160777	115.312345
BUS014	Wind farm point count	12/01/2024 7:45	12/01/2024 8:15	-34.160777	115.312345
BUS015	Audio recording	14/08/2023 17:15	15/08/2023 7:15	-34.282869	115.288313
BUS015	Audio recording	17/11/2023 18:32	18/11/2023 5:36	-34.282672	115.288361
BUS015	Audio recording	11/01/2024 19:05	14/01/2024 5:40	-34.282871	115.288324
BUS015	Site description	25/05/2023 13:08	25/05/2023 13:08	-34.282836	115.288269

Site name	Sample method	Date start	Date stop	Latitude	Longitude
BUS015	Ultrasonic recording	25/05/2023 16:50	26/05/2023 7:34	-34.282838	115.288269
BUS015	Ultrasonic recording	14/08/2023 17:15	15/08/2023 7:15	-34.282879	115.288306
BUS015	Ultrasonic recording	17/11/2023 18:33	18/11/2023 5:36	-34.282751	115.288333
BUS015	Ultrasonic recording	11/01/2024 19:05	14/01/2024 5:40	-34.282879	115.288332
BUS015	Wind farm point count	25/05/2023 13:00	25/05/2023 13:30	-34.282841	115.288261
BUS015	Wind farm point count	26/05/2023 12:50	26/05/2023 13:20	-34.282841	115.288261
BUS015	Wind farm point count	14/08/2023 10:15	14/08/2023 10:45	-34.282841	115.288261
BUS015	Wind farm point count	16/08/2023 7:55	16/08/2023 8:25	-34.282841	115.288261
BUS015	Wind farm point count	17/11/2023 13:00	17/11/2023 13:30	-34.282841	115.288261
BUS015	Wind farm point count	18/11/2023 6:55	18/11/2023 7:25	-34.282841	115.288261
BUS015	Wind farm point count	10/01/2024 6:55	10/01/2024 7:25	-34.282841	115.288261
BUS015	Wind farm point count	11/01/2024 11:30	11/01/2024 12:00	-34.282841	115.288261
BUS016	Site description	7/03/2025 10:35	7/03/2025 10:35	-34.233438	115.271067
BUS016	Wind farm point count	27/09/2024 14:45	27/09/2024 15:15	-34.233378	115.271032
BUS016	Wind farm point count	30/09/2024 10:45	30/09/2024 11:15	-34.233378	115.271032
BUS016	Wind farm point count	18/10/2024 13:50	18/10/2024 14:20	-34.233378	115.271032
BUS016	Wind farm point count	21/10/2024 11:15	21/10/2024 11:45	-34.233378	115.271032
BUS016	Wind farm point count	13/11/2024 12:50	13/11/2024 13:20	-34.233378	115.271032
BUS016	Wind farm point count	14/11/2024 9:00	14/11/2024 9:30	-34.233378	115.271032
BUS016	Wind farm point count	12/12/2024 7:50	12/12/2024 8:20	-34.233378	115.271032
BUS016	Wind farm point count	12/12/2024 12:35	12/12/2024 13:05	-34.233378	115.271032
BUS016	Wind farm point count	16/01/2025 12:40	16/01/2025 13:10	-34.233378	115.271032
BUS016	Wind farm point count	17/01/2025 11:20	17/01/2025 11:50	-34.233378	115.271032
BUS016	Wind farm point count	14/02/2025 7:40	14/02/2025 8:10	-34.233378	115.271032
BUS016	Wind farm point count	14/02/2025 12:45	14/02/2025 13:15	-34.233378	115.271032
BUS016	Wind farm point count	7/03/2025 10:20	7/03/2025 10:50	-34.233378	115.271032
BUS016	Wind farm point count	7/03/2025 15:10	7/03/2025 15:40	-34.233378	115.271032
BUS017	Site description	7/03/2025 11:01	7/03/2025 11:01	-34.224688	115.269171
BUS017	Wind farm point count	27/09/2024 14:10	27/09/2024 14:40	-34.224649	115.269174
BUS017	Wind farm point count	30/09/2024 11:20	30/09/2024 11:50	-34.224649	115.269174
BUS017	Wind farm point count	18/10/2024 13:15	18/10/2024 13:45	-34.224649	115.269174
BUS017	Wind farm point count	21/10/2024 10:35	21/10/2024 11:05	-34.224649	115.269174
BUS017	Wind farm point count	13/11/2024 13:20	13/11/2024 13:50	-34.224649	115.269174
BUS017	Wind farm point count	14/11/2024 9:35	14/11/2024 10:05	-34.224649	115.269174
BUS017	Wind farm point count	12/12/2024 7:15	12/12/2024 7:45	-34.224649	115.269174
BUS017	Wind farm point count	12/12/2024 12:00	12/12/2024 12:30	-34.224649	115.269174
BUS017	Wind farm point count	16/01/2025 13:15	16/01/2025 13:45	-34.224649	115.269174
BUS017	Wind farm point count	17/01/2025 11:52	17/01/2025 12:22	-34.224649	115.269174
BUS017	Wind farm point count	14/02/2025 7:05	14/02/2025 7:35	-34.224649	115.269174
BUS017	Wind farm point count	14/02/2025 12:10	14/02/2025 12:40	-34.224649	115.269174
BUS017	Wind farm point count	7/03/2025 10:55	7/03/2025 11:25	-34.224649	115.269174
BUS017	Wind farm point count	7/03/2025 15:45	7/03/2025 16:15	-34.224649	115.269174
BUS018	Site description	6/03/2025 9:07	6/03/2025 9:07	-34.191585	115.284558

Site name	Sample method	Date start	Date stop	Latitude	Longitude
BUS018	Wind farm point count	27/09/2024 13:30	27/09/2024 14:00	-34.191476	115.284547
BUS018	Wind farm point count	30/09/2024 17:00	30/09/2024 17:30	-34.191476	115.284547
BUS018	Wind farm point count	18/10/2024 12:30	18/10/2024 13:00	-34.191476	115.284547
BUS018	Wind farm point count	21/10/2024 9:45	21/10/2024 10:15	-34.191476	115.284547
BUS018	Wind farm point count	13/11/2024 13:55	13/11/2024 14:25	-34.191476	115.284547
BUS018	Wind farm point count	14/11/2024 10:25	14/11/2024 10:55	-34.191476	115.284547
BUS018	Wind farm point count	11/12/2024 8:25	11/12/2024 8:55	-34.191476	115.284547
BUS018	Wind farm point count	11/12/2024 14:30	11/12/2024 15:00	-34.191476	115.284547
BUS018	Wind farm point count	16/01/2025 14:00	16/01/2025 14:30	-34.191476	115.284547
BUS018	Wind farm point count	17/01/2025 9:15	17/01/2025 9:45	-34.191476	115.284547
BUS018	Wind farm point count	13/02/2025 10:55	13/02/2025 11:25	-34.191476	115.284547
BUS018	Wind farm point count	13/02/2025 16:30	13/02/2025 17:00	-34.191476	115.284547
BUS018	Wind farm point count	6/03/2025 9:00	6/03/2025 9:30	-34.191476	115.284547
BUS018	Wind farm point count	6/03/2025 14:15	6/03/2025 14:45	-34.191476	115.284547
BUS019	Site description	7/03/2025 7:24	7/03/2025 7:24	-34.240158	115.321738
BUS019	Wind farm point count	27/09/2024 17:42	27/09/2024 18:12	-34.240122	115.321745
BUS019	Wind farm point count	30/09/2024 6:45	30/09/2024 7:15	-34.240122	115.321745
BUS019	Wind farm point count	17/10/2024 11:20	17/10/2024 11:50	-34.240122	115.321745
BUS019	Wind farm point count	18/10/2024 15:50	18/10/2024 16:20	-34.240122	115.321745
BUS019	Wind farm point count	13/11/2024 11:05	13/11/2024 11:35	-34.240122	115.321745
BUS019	Wind farm point count	13/11/2024 16:30	13/11/2024 17:00	-34.240122	115.321745
BUS019	Wind farm point count	11/12/2024 11:40	11/12/2024 12:10	-34.240122	115.321745
BUS019	Wind farm point count	11/12/2024 17:45	11/12/2024 18:15	-34.240122	115.321745
BUS019	Wind farm point count	16/01/2025 9:40	16/01/2025 10:10	-34.240122	115.321745
BUS019	Wind farm point count	17/01/2025 14:15	17/01/2025 14:45	-34.240122	115.321745
BUS019	Wind farm point count	14/02/2025 10:50	14/02/2025 11:20	-34.240122	115.321745
BUS019	Wind farm point count	14/02/2025 15:55	14/02/2025 16:25	-34.240122	115.321745
BUS019	Wind farm point count	7/03/2025 7:15	7/03/2025 7:45	-34.240122	115.321745
BUS019	Wind farm point count	7/03/2025 12:05	7/03/2025 12:35	-34.240122	115.321745
BUS020	Site description	7/03/2025 14:37	7/03/2025 14:37	-34.247166	115.279992
BUS020	Wind farm point count	27/09/2024 15:20	27/09/2024 15:50	-34.247119	115.279827
BUS020	Wind farm point count	30/09/2024 9:35	30/09/2024 10:05	-34.247119	115.279827
BUS020	Wind farm point count	18/10/2024 11:40	18/10/2024 12:10	-34.247119	115.279827
BUS020	Wind farm point count	18/10/2024 15:10	18/10/2024 15:40	-34.247119	115.279827
BUS020	Wind farm point count	13/11/2024 12:15	13/11/2024 12:45	-34.247119	115.279827
BUS020	Wind farm point count	14/11/2024 8:15	14/11/2024 8:45	-34.247119	115.279827
BUS020	Wind farm point count	12/12/2024 8:45	12/12/2024 9:15	-34.247119	115.279827
BUS020	Wind farm point count	12/12/2024 13:10	12/12/2024 13:40	-34.247119	115.279827
BUS020	Wind farm point count	16/01/2025 12:05	16/01/2025 12:35	-34.247119	115.279827
BUS020	Wind farm point count	17/01/2025 10:45	17/01/2025 11:15	-34.247119	115.279827
BUS020	Wind farm point count	14/02/2025 8:15	14/02/2025 8:45	-34.247119	115.279827
BUS020	Wind farm point count	14/02/2025 13:20	14/02/2025 13:50	-34.247119	115.279827
BUS020	Wind farm point count	7/03/2025 9:05	7/03/2025 9:35	-34.247119	115.279827

Site name	Sample method	Date start	Date stop	Latitude	Longitude
BUS020	Wind farm point count	7/03/2025 14:30	7/03/2025 15:00	-34.247119	115.279827
BUS021	Site description	7/03/2025 9:57	7/03/2025 9:57	-34.2611	115.300126
BUS021	Wind farm point count	27/09/2024 16:00	27/09/2024 16:30	-34.261091	115.300145
BUS021	Wind farm point count	30/09/2024 8:35	30/09/2024 9:05	-34.261091	115.300145
BUS021	Wind farm point count	18/10/2024 11:00	18/10/2024 11:30	-34.261091	115.300145
BUS021	Wind farm point count	18/10/2024 14:30	18/10/2024 15:00	-34.261091	115.300145
BUS021	Wind farm point count	13/11/2024 14:45	13/11/2024 15:15	-34.261091	115.300145
BUS021	Wind farm point count	14/11/2024 7:35	14/11/2024 8:05	-34.261091	115.300145
BUS021	Wind farm point count	12/12/2024 10:45	12/12/2024 11:15	-34.261091	115.300145
BUS021	Wind farm point count	12/12/2024 15:00	12/12/2024 15:30	-34.261091	115.300145
BUS021	Wind farm point count	16/01/2025 11:25	16/01/2025 11:55	-34.261091	115.300145
BUS021	Wind farm point count	17/01/2025 12:35	17/01/2025 13:05	-34.261091	115.300145
BUS021	Wind farm point count	14/02/2025 9:00	14/02/2025 9:30	-34.261091	115.300145
BUS021	Wind farm point count	14/02/2025 14:10	14/02/2025 14:40	-34.261091	115.300145
BUS021	Wind farm point count	7/03/2025 9:40	7/03/2025 10:10	-34.261091	115.300145
BUS021	Wind farm point count	7/03/2025 13:50	7/03/2025 14:20	-34.261091	115.300145
BUS022	Site description	7/03/2025 8:46	7/03/2025 8:46	-34.250815	115.2959
BUS022	Wind farm point count	27/09/2024 16:35	27/09/2024 17:05	-34.251063	115.295824
BUS022	Wind farm point count	30/09/2024 7:55	30/09/2024 8:25	-34.251063	115.295824
BUS022	Wind farm point count	17/10/2024 12:50	17/10/2024 13:20	-34.251063	115.295824
BUS022	Wind farm point count	18/10/2024 10:25	18/10/2024 10:55	-34.251063	115.295824
BUS022	Wind farm point count	13/11/2024 15:20	13/11/2024 15:50	-34.251063	115.295824
BUS022	Wind farm point count	14/11/2024 6:55	14/11/2024 7:25	-34.251063	115.295824
BUS022	Wind farm point count	12/12/2024 9:25	12/12/2024 9:55	-34.251063	115.295824
BUS022	Wind farm point count	12/12/2024 13:45	12/12/2024 14:15	-34.251063	115.295824
BUS022	Wind farm point count	16/01/2025 10:50	16/01/2025 11:20	-34.251063	115.295824
BUS022	Wind farm point count	17/01/2025 13:10	17/01/2025 13:40	-34.251063	115.295824
BUS022	Wind farm point count	14/02/2025 9:40	14/02/2025 10:10	-34.251063	115.295824
BUS022	Wind farm point count	14/02/2025 14:45	14/02/2025 15:15	-34.251063	115.295824
BUS022	Wind farm point count	7/03/2025 8:25	7/03/2025 8:55	-34.251063	115.295824
BUS022	Wind farm point count	7/03/2025 13:15	7/03/2025 13:45	-34.251063	115.295824
BUS023	Site description	7/03/2025 7:54	7/03/2025 7:54	-34.240175	115.302017
BUS023	Wind farm point count	27/09/2024 17:10	27/09/2024 17:40	-34.240173	115.302066
BUS023	Wind farm point count	30/09/2024 7:20	30/09/2024 7:50	-34.240173	115.302066
BUS023	Wind farm point count	17/10/2024 12:15	17/10/2024 12:45	-34.240173	115.302066
BUS023	Wind farm point count	18/10/2024 9:50	18/10/2024 10:20	-34.240173	115.302066
BUS023	Wind farm point count	13/11/2024 11:40	13/11/2024 12:10	-34.240173	115.302066
BUS023	Wind farm point count	13/11/2024 15:55	13/11/2024 16:25	-34.240173	115.302066
BUS023	Wind farm point count	12/12/2024 10:00	12/12/2024 10:30	-34.240173	115.302066
BUS023	Wind farm point count	12/12/2024 14:20	12/12/2024 14:50	-34.240173	115.302066
BUS023	Wind farm point count	16/01/2025 10:15	16/01/2025 10:45	-34.240173	115.302066
BUS023	Wind farm point count	17/01/2025 13:42	17/01/2025 14:12	-34.240173	115.302066
BUS023	Wind farm point count	14/02/2025 10:15	14/02/2025 10:45	-34.240173	115.302066

Site name	Sample method	Date start	Date stop	Latitude	Longitude
BUS023	Wind farm point count	14/02/2025 15:20	14/02/2025 15:50	-34.240173	115.302066
BUS023	Wind farm point count	7/03/2025 7:50	7/03/2025 8:20	-34.240173	115.302066
BUS023	Wind farm point count	7/03/2025 12:40	7/03/2025 13:10	-34.240173	115.302066
BUS024	Site description	6/03/2025 9:46	6/03/2025 9:46	-34.192968	115.308178
BUS024	Wind farm point count	27/09/2024 9:35	27/09/2024 10:05	-34.193125	115.308282
BUS024	Wind farm point count	30/09/2024 16:10	30/09/2024 16:40	-34.193125	115.308282
BUS024	Wind farm point count	17/10/2024 10:40	17/10/2024 11:10	-34.193125	115.308282
BUS024	Wind farm point count	17/10/2024 16:50	17/10/2024 17:20	-34.193125	115.308282
BUS024	Wind farm point count	13/11/2024 8:15	13/11/2024 8:45	-34.193125	115.308282
BUS024	Wind farm point count	14/11/2024 12:40	14/11/2024 13:10	-34.193125	115.308282
BUS024	Wind farm point count	11/12/2024 9:10	11/12/2024 9:40	-34.193125	115.308282
BUS024	Wind farm point count	11/12/2024 15:10	11/12/2024 15:40	-34.193125	115.308282
BUS024	Wind farm point count	17/01/2025 9:55	17/01/2025 10:25	-34.193125	115.308282
BUS024	Wind farm point count	17/01/2025 15:00	17/01/2025 15:30	-34.193125	115.308282
BUS024	Wind farm point count	13/02/2025 11:35	13/02/2025 12:05	-34.193125	115.308282
BUS024	Wind farm point count	13/02/2025 15:35	13/02/2025 16:05	-34.193125	115.308282
BUS024	Wind farm point count	6/03/2025 9:40	6/03/2025 10:10	-34.193125	115.308282
BUS024	Wind farm point count	6/03/2025 13:40	6/03/2025 14:10	-34.193125	115.308282
BUS025	Site description	6/03/2025 8:20	6/03/2025 8:20	-34.202631	115.298285
BUS025	Wind farm point count	27/09/2024 8:40	27/09/2024 9:10	-34.202664	115.298285
BUS025	Wind farm point count	30/09/2024 15:19	30/09/2024 15:49	-34.202664	115.298285
BUS025	Wind farm point count	17/10/2024 9:50	17/10/2024 10:20	-34.202664	115.298285
BUS025	Wind farm point count	17/10/2024 16:00	17/10/2024 16:30	-34.202664	115.298285
BUS025	Wind farm point count	13/11/2024 7:35	13/11/2024 8:05	-34.202664	115.298285
BUS025	Wind farm point count	14/11/2024 12:00	14/11/2024 12:30	-34.202664	115.298285
BUS025	Wind farm point count	11/12/2024 7:40	11/12/2024 8:10	-34.202664	115.298285
BUS025	Wind farm point count	11/12/2024 13:45	11/12/2024 14:15	-34.202664	115.298285
BUS025	Wind farm point count	17/01/2025 8:25	17/01/2025 8:55	-34.202664	115.298285
BUS025	Wind farm point count	17/01/2025 15:40	17/01/2025 16:10	-34.202664	115.298285
BUS025	Wind farm point count	13/02/2025 10:10	13/02/2025 10:40	-34.202664	115.298285
BUS025	Wind farm point count	13/02/2025 14:55	13/02/2025 15:25	-34.202664	115.298285
BUS025	Wind farm point count	6/03/2025 8:05	6/03/2025 8:35	-34.202664	115.298285
BUS025	Wind farm point count	6/03/2025 13:05	6/03/2025 13:35	-34.202664	115.298285
BUS026	Site description	6/03/2025 7:47	6/03/2025 7:47	-34.198106	115.317679
BUS026	Wind farm point count	27/09/2024 7:45	27/09/2024 8:15	-34.198169	115.317557
BUS026	Wind farm point count	30/09/2024 14:35	30/09/2024 15:05	-34.198169	115.317557
BUS026	Wind farm point count	17/10/2024 8:55	17/10/2024 9:25	-34.198169	115.317557
BUS026	Wind farm point count	17/10/2024 15:20	17/10/2024 15:50	-34.198169	115.317557
BUS026	Wind farm point count	13/11/2024 6:55	13/11/2024 7:25	-34.198169	115.317557
BUS026	Wind farm point count	14/11/2024 13:20	14/11/2024 13:50	-34.198169	115.317557
BUS026	Wind farm point count	11/12/2024 6:45	11/12/2024 7:15	-34.198169	115.317557
BUS026	Wind farm point count	11/12/2024 13:00	11/12/2024 13:30	-34.198169	115.317557
BUS026	Wind farm point count	16/01/2025 15:00	16/01/2025 15:30	-34.198169	115.317557

Site name	Sample method	Date start	Date stop	Latitude	Longitude
BUS026	Wind farm point count	17/01/2025 7:15	17/01/2025 7:45	-34.198169	115.317557
BUS026	Wind farm point count	13/02/2025 9:30	13/02/2025 10:00	-34.198169	115.317557
BUS026	Wind farm point count	13/02/2025 14:15	13/02/2025 14:45	-34.198169	115.317557
BUS026	Wind farm point count	6/03/2025 7:25	6/03/2025 7:55	-34.198169	115.317557
BUS026	Wind farm point count	6/03/2025 14:55	6/03/2025 15:25	-34.198169	115.317557
BUS027	Site description	6/03/2025 10:32	6/03/2025 10:32	-34.225683	115.318117
BUS027	Wind farm point count	27/09/2024 10:30	27/09/2024 11:00	-34.225691	115.317954
BUS027	Wind farm point count	30/09/2024 12:05	30/09/2024 12:35	-34.225691	115.317954
BUS027	Wind farm point count	17/10/2024 6:45	17/10/2024 7:15	-34.225691	115.317954
BUS027	Wind farm point count	17/10/2024 13:20	17/10/2024 13:50	-34.225691	115.317954
BUS027	Wind farm point count	13/11/2024 9:10	13/11/2024 9:40	-34.225691	115.317954
BUS027	Wind farm point count	14/11/2024 14:05	14/11/2024 14:35	-34.225691	115.317954
BUS027	Wind farm point count	11/12/2024 9:55	11/12/2024 10:25	-34.225691	115.317954
BUS027	Wind farm point count	11/12/2024 15:55	11/12/2024 16:25	-34.225691	115.317954
BUS027	Wind farm point count	16/01/2025 7:45	16/01/2025 8:15	-34.225691	115.317954
BUS027	Wind farm point count	16/01/2025 15:35	16/01/2025 16:05	-34.225691	115.317954
BUS027	Wind farm point count	13/02/2025 7:20	13/02/2025 7:50	-34.225691	115.317954
BUS027	Wind farm point count	13/02/2025 12:20	13/02/2025 12:50	-34.225691	115.317954
BUS027	Wind farm point count	6/03/2025 10:30	6/03/2025 11:00	-34.225691	115.317954
BUS027	Wind farm point count	6/03/2025 15:30	6/03/2025 16:00	-34.225691	115.317954
BUS028	Site description	6/03/2025 11:45	6/03/2025 11:45	-34.22418	115.306055
BUS028	Wind farm point count	27/09/2024 11:05	27/09/2024 11:35	-34.224268	115.306632
BUS028	Wind farm point count	30/09/2024 13:45	30/09/2024 14:15	-34.224268	115.306632
BUS028	Wind farm point count	17/10/2024 7:20	17/10/2024 7:50	-34.224268	115.306632
BUS028	Wind farm point count	17/10/2024 13:55	17/10/2024 14:25	-34.224268	115.306632
BUS028	Wind farm point count	13/11/2024 9:45	13/11/2024 10:15	-34.224268	115.306632
BUS028	Wind farm point count	14/11/2024 14:40	14/11/2024 15:10	-34.224268	115.306632
BUS028	Wind farm point count	11/12/2024 11:05	11/12/2024 11:35	-34.224268	115.306632
BUS028	Wind farm point count	11/12/2024 17:05	11/12/2024 17:35	-34.224268	115.306632
BUS028	Wind farm point count	16/01/2025 8:20	16/01/2025 8:50	-34.224268	115.306632
BUS028	Wind farm point count	16/01/2025 16:45	16/01/2025 17:15	-34.224268	115.306632
BUS028	Wind farm point count	13/02/2025 7:55	13/02/2025 8:25	-34.224268	115.306632
BUS028	Wind farm point count	13/02/2025 12:55	13/02/2025 13:25	-34.224268	115.306632
BUS028	Wind farm point count	6/03/2025 11:40	6/03/2025 12:10	-34.224268	115.306632
BUS028	Wind farm point count	6/03/2025 16:45	6/03/2025 17:15	-34.224268	115.306632
BUS029	Site description	6/03/2025 11:15	6/03/2025 11:15	-34.21545	115.293401
BUS029	Wind farm point count	27/09/2024 11:40	27/09/2024 12:10	-34.215585	115.293307
BUS029	Wind farm point count	30/09/2024 13:10	30/09/2024 13:40	-34.215585	115.293307
BUS029	Wind farm point count	17/10/2024 8:00	17/10/2024 8:30	-34.215585	115.293307
BUS029	Wind farm point count	17/10/2024 14:30	17/10/2024 15:00	-34.215585	115.293307
BUS029	Wind farm point count	13/11/2024 10:20	13/11/2024 10:50	-34.215585	115.293307
BUS029	Wind farm point count	14/11/2024 15:15	14/11/2024 15:45	-34.215585	115.293307
BUS029	Wind farm point count	11/12/2024 10:30	11/12/2024 11:00	-34.215585	115.293307

Site name	Sample method	Date start	Date stop	Latitude	Longitude
BUS029	Wind farm point count	11/12/2024 16:30	11/12/2024 17:00	-34.215585	115.293307
BUS029	Wind farm point count	16/01/2025 8:55	16/01/2025 9:25	-34.215585	115.293307
BUS029	Wind farm point count	16/01/2025 16:10	16/01/2025 16:40	-34.215585	115.293307
BUS029	Wind farm point count	13/02/2025 8:35	13/02/2025 9:05	-34.215585	115.293307
BUS029	Wind farm point count	13/02/2025 13:30	13/02/2025 14:00	-34.215585	115.293307
BUS029	Wind farm point count	6/03/2025 11:05	6/03/2025 11:35	-34.215585	115.293307
BUS029	Wind farm point count	6/03/2025 16:10	6/03/2025 16:40	-34.215585	115.293307
BUS030	Wind farm point count	29/09/2024 10:35	29/09/2024 11:05	-34.317331	115.179621
BUS030	Wind farm point count	2/12/2024 13:00	2/12/2024 13:30	-34.317331	115.179621
BUS031	Wind farm point count	29/09/2024 8:00	29/09/2024 8:30	-34.289223	115.176383
BUS031	Wind farm point count	2/12/2024 9:50	2/12/2024 10:20	-34.289223	115.176383
BUS032	Wind farm point count	29/09/2024 9:20	29/09/2024 9:50	-34.320039	115.166109
BUS032	Wind farm point count	2/12/2024 11:15	2/12/2024 11:45	-34.320039	115.166109
BUS033	Wind farm point count	29/09/2024 9:55	29/09/2024 10:25	-34.322382	115.171192
BUS034	Wind farm point count	29/09/2024 11:30	29/09/2024 12:00	-34.316551	115.185423
BUS034	Wind farm point count	2/12/2024 12:25	2/12/2024 12:55	-34.316551	115.185423
BUS035	Audio recording	17/11/2023 18:32	18/11/2023 5:36	-34.27018	115.297746
BUS035	Ultrasonic recording	17/11/2023 18:33	18/11/2023 5:36	-34.270178	115.297749
BUS035	Wind farm point count	17/11/2023 15:45	17/11/2023 16:15	-34.270165	115.297736
BUS035	Wind farm point count	18/11/2023 8:00	18/11/2023 8:30	-34.270165	115.297736

Appendix 4 DAWE (2022) black cockatoo foraging quality scoring tool

Table A1 Foraging quality scoring tool template

Starting score		Baudin's Cockatoo	Carnaby's Cockatoo	Forest Red-tailed Black-Cockatoo
10		**Start at a score of 10** if your site is native eucalypt woodlands and forest, and proteaceous woodland and heath, particularly Marri, within the range of the species, including along roadsides and parkland cleared areas. Can include planted vegetation. **This tool only applies to sites equal to or larger than 1 hectare in size.**	**Start at a score of 10** if your site is native shrubland, kwongan heathland or woodland, dominated by proteaceous plant species such as *Banksia* spp. (including *Dryandra* spp.), *Hakea* spp. and *Grevillea* spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. **This tool only applies to sites equal to or larger than 1 hectare in size.**	**Start at a score of 10** if your site is Jarrah or Marri woodland and/or forest, or if it is on the edge of Karri forest, or if Wandoo and Blackbutt occur on the site, within the range of the subspecies, including along roadsides and parkland cleared areas. **This tool only applies to sites equal to or larger than 1 hectare in size.**
Attribute	Sub-tractions	Context adjustor (attributes reducing functionality of foraging habitat)		
Foraging potential	**-2**	**Subtract 2** from your score if there is no evidence of feeding debris on your site.	**Subtract 2** from your score if there is no evidence of feeding debris on your site.	**Subtract 2** from your score if there is no evidence of feeding debris on your site.
Connectivity	**-2**	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.
Proximity to breeding	**-2**	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat.	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat.
Proximity to roosting	**-1**	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.
Impact from significant plant disease	**-1**	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.
Total score		*Enter score*	*Enter score*	*Enter score*
Appraisal		To support your habitat score, you should provide an overall appraisal of the habitat on the impact site and within 20km of the impact area to clearly explain and justify the score. It should include discussion on the foraging habitat's proximity to other resources (e.g. exact distance to proximate resources), frequency of use of proximate sites, the degree of evidence and description of vegetation type and condition.		

Appendix 5 Bamford (2021) black cockatoo foraging quality scoring tool

Scoring system for the assessment of foraging value of vegetation for Black-Cockatoos. Revised 4th April 2021

Bamford Consulting Ecologists

Introduction

Application of the Offset Assessment Guide (offsets guide) developed by the federal environment department for assessing Black-Cockatoo foraging habitat requires the calculation of a score out of 10. The following system has been developed by Bamford Consulting Ecologists (BCE) with assistance from Quessentia Consulting to provide an objective scoring system that is practical and can be used by trained field zoologists with experience in the environments frequented by the species.

The foraging value score provides a numerical value that reflects the significance of vegetation as foraging habitat for Black-Cockatoos, and this numerical value is designed to provide the information needed by the Federal Department of Agriculture, Water and the Environment (DAWE) to assess impact significance and offset requirements. The foraging value of the vegetation depends upon the type, density and condition of trees and shrubs in an area and can be influenced by the context such as the availability of foraging habitat nearby. The BCE scoring system for value of foraging habitat has 3 components as detailed above. These 3 components are drawn from the DAWE offsets guide but the scoring approach was developed by BCE and includes a fourth (moderation) component.

Note that the scoring system can only be applied within the range of the species or at least where the species could reasonably be expected to occur based upon existing information.

Calculating the total score (out of 10) requires the following steps:

A. Site condition. Determining a score out of 6 for the vegetation composition, condition and structure; plus
B. Site context. Determining a score out of 3 for the context of the site; plus
C. Species stocking rate. Determining a score out of one for species density.
D. Determining the total score out of 10, which may require moderation for context and species density with respect to the site condition (vegetation) score. Moderation also includes consideration of pine plantations as a special case for foraging value.

The BCE scoring system places the greatest weight on site condition (scale of 0 to 6) because this has the highest influence on the foraging values of a site, which in turn is the fundamental driver in meeting ecological requirements for continued survival.

Site context has a lower weight (scale of 0 to 3) in recognition of the mobility of the species, which means they can access good foraging habitat even in fragmented landscapes, but allowing for recognition of the extent of available habitat in a region and context in relation to activity (such as breeding and roosting). The application of scoring site context is further discussed below.

Species stocking rate is given a low weight (0 to 1) as it is a means only of recognising that a species may or may not be abundant at a site, but that abundance is dependent upon site condition and context and is thus not an independent variable. The abundance of a species is also sensitive to sampling effort, and to seasonal and annual variation, and is therefore an unreliable indicator of actual importance of a site to a species.

Calculation of scores and the moderation process are described in detail below.

A. Site condition. Vegetation composition, condition and structure scoring

Site Score	Description of Vegetation Values		
	Carnaby's Black-Cockatoo	Baudin's Black-Cockatoo	Forest Red-tailed Black-Cockatoo
0	No foraging value. No Proteaceae, eucalypts or other potential sources of food. Examples: • Water bodies (e.g., salt lakes, dams, rivers); • Bare ground; • Developed sites devoid of vegetation (e.g., infrastructure, roads, gravel pits) or with vegetation of no food value, such as some suburban landscapes. • Mown grass	No foraging value. No eucalypts or other potential sources of food. Examples: • Water bodies (e.g., dams, rivers); • Bare ground; • Developed sites devoid of vegetation (e.g., infrastructure, roads, gravel pits).	No foraging value. No eucalypts or other potential sources of food. Examples: • Water bodies (e.g., dams, rivers); • Bare ground; • Developed sites devoid of vegetation (e.g., infrastructure, roads, gravel pits).
1	Negligible to low foraging value. Examples: • Scattered specimens of known food plants but projected foliage cover of these is < 2%. This could include urban areas with scattered foraging trees; • Paddocks that are lightly vegetated with melons or other known food source weeds (e.g., *Erodium* spp.) that represent a short-term and/or seasonal food source; • Blue Gum plantations (foraging by Carnaby's Black-Cockatoos has been reported but appears to be unusual).	Negligible to low foraging value. Scattered specimens of known food plants but projected foliage cover of these < 1%. This could include urban areas with scattered foraging trees.	Negligible to low foraging value. Scattered specimens of known food plants but projected foliage cover of these < 1%. Could include urban areas with scattered foraging trees.

Site Score	Description of Vegetation Values		
	Carnaby's Black-Cockatoo	Baudin's Black-Cockatoo	Forest Red-tailed Black-Cockatoo
2	Low foraging value. Examples: • Shrubland in which species of foraging value, such as shrubby banksias, have < 10% projected foliage cover; • Woodland with tree banksias 2-5% projected foliage cover; • Woodland with tree banksias (of key species *B. attenuata* and *B. menziesii*) with <10% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Open eucalypt woodland/mallee of small-fruited species; • Paddocks that are densely vegetated with melons or other known food source weeds (e.g., *Erodium* spp.) that represent a short-term and/or seasonal food source.	Low foraging value. Examples: • Woodland with scattered specimens of known food plants (e.g., Marri and Jarrah) 1-5% projected foliage cover; • Marri-Jarrah Woodland with <10% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Parkland-cleared Eucalypt Woodland/Forest with known food plants <10% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants <10% projected foliage cover (establishing food sources with good long-term viability); • Urban areas with scattered foraging trees.	Low foraging value. Examples: • Woodland with scattered specimens of known food plants (e.g., Marri, Jarrah) 1-5% projected foliage cover; • Marri-Jarrah Woodland with <10% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Sheoak Woodland with <10% projected foliage cover; • Parkland-cleared Eucalypt Woodland/Forest with known food plants <10% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants <10% projected foliage cover (establishing food sources with good long-term viability); • Urban areas with scattered food plants such as Cape Lilac, *Eucalyptus caesia* and *E. erythrocorys*.

Site Score	Description of Vegetation Values		
	Carnaby's Black-Cockatoo	Baudin's Black-Cockatoo	Forest Red-tailed Black-Cockatoo
3	Low to Moderate foraging value. Examples: • Shrubland in which species of foraging value, such as shrubby banksias, have 10-20% projected foliage cover; • Woodland with tree banksias 5-20% projected foliage cover; • Woodland with tree banksias (of key species *B. attenuata* and *B. menziesii*) with 10-40% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Eucalypt Woodland/Mallee of small-fruited species; • Eucalypt Woodland with Marri < 10% projected foliage cover.	Low to Moderate foraging value. Examples: • Eucalypt Woodland with known food plants (especially Marri) 5-20% projected foliage cover; • Marri-Jarrah Woodland with 10-40% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Parkland-cleared Eucalypt Woodland/Forest with known food plants 10-40% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants 10-40% projected foliage cover (establishing food sources with good long-term viability).	Low to Moderate foraging value. Examples: • Eucalypt Woodland with known food plants (especially Marri and Jarrah; also Pricklybark (Coastal Blackbutt) where it occurs in Banksia Woodlands) 5-20% projected foliage cover; • Marri-Jarrah Woodland with 10-40% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Sheoak Forest with 10-40% projected foliage cover; • Parkland-cleared Eucalypt Woodland/Forest with known food plants 10-40% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants 10-40% projected foliage cover (establishing food sources with good long-term viability).

Site Score	Description of Vegetation Values		
	Carnaby's Black-Cockatoo	Baudin's Black-Cockatoo	Forest Red-tailed Black-Cockatoo
4	Moderate foraging value. Examples: • Woodland/low forest with tree banksias (of key species *B. attenuata* and *B. menziesii*) 20-40% projected foliage cover; • Woodland/low forest with tree banksias (of key species *B. attenuata* and *B. menziesii*) with 40-60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Kwongan/ Shrubland in which species of foraging value, such as shrubby banksias, have 20-40% projected foliage cover; • Eucalypt Woodland/Forest with Marri 20-40% projected foliage cover.	Moderate foraging value. Examples: • Marri-Jarrah Woodland/Forest with 20-40% projected foliage cover; • Marri-Jarrah Forest with 40-60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Parkland-cleared Eucalypt Woodland/Forest with known food plants 40-60% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants 40-60% projected foliage cover (establishing food sources with good long-term viability); • Orchards with highly desirable food sources (e.g., apples, pears, some stone fruits).	Moderate foraging value. Examples: • Marri-Jarrah Woodland/Forest with 20-40% projected foliage cover; • Marri-Jarrah Forest with 40-60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Sheoak Forest with 40-60% projected foliage cover; • Parkland-cleared Eucalypt Woodland/Forest with known food plants 40-60% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants 40-60% projected foliage cover (establishing food sources with good long-term viability).

Site Score	Description of Vegetation Values		
	Carnaby's Black-Cockatoo	Baudin's Black-Cockatoo	Forest Red-tailed Black-Cockatoo
5	Moderate to High foraging value. Examples: • Banksia Low Forest (of key species *B. attenuata* and *B. menziesii*) with 40-60% projected foliage cover; • Banksia Low Forest (of key species *B. attenuata* and *B. menziesii*) with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Kwongan/ Shrubland in which species of foraging value, such as shrubby banksias, have 40-60% projected foliage cover; • Marri-Jarrah Forest with 40-60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium-term). • Pine plantations with trees more than 10 years old (but see pine note below in moderation section).	Moderate to High foraging value. Examples: • Marri-Jarrah Forest with 40-60% projected foliage cover; • Marri-Jarrah Forest with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Parkland-cleared Eucalypt Woodland/Forest with known food plants >60% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants >60% projected foliage cover (establishing food sources with good long-term viability).	Moderate to High foraging value. Examples: • Marri-Jarrah Forest with 40-60% projected foliage cover; • Marri-Jarrah Forest with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Sheoak Forest with > 60% projected foliage cover; • Parkland-cleared Eucalypt Woodland/Forest with known food plants >60% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants >60% projected foliage cover (establishing food sources with good long-term viability).

Site Score	Description of Vegetation Values		
	Carnaby's Black-Cockatoo	Baudin's Black-Cockatoo	Forest Red-tailed Black-Cockatoo
6	High foraging value. Example: • Banksia Low Forest (of key species *B. attenuata* and *B. menziesii*) with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium-term). • Kwongan/ Shrubland in which species of foraging value, such as shrubby banksias, have >60% projected foliage cover; • Marri-Jarrah Forest with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium-term).	High foraging value. Example: • Marri-Jarrah Forest with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium-term).	High foraging value. Example: • Marri-Jarrah Forest with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium-term).

Vegetation structural class terminology follows Keighery (1994)

A. Site context.

Site Context is a function of site size, availability of nearby habitat and the availability of nearby breeding areas. Site context includes consideration of connectivity, although Black-Cockatoos are very mobile and will fly across paddocks to access foraging sites. Based on BCE observations, Black-Cockatoos are unlikely to regularly go over open ground for a distance of more than a few kilometres and prefer to follow tree-lines.

The maximum score for site context is 3, and because it is effectively a function of presence/absence of nearby breeding and the distribution of foraging habitat across the landscape, the following table, developed by Bamford Consulting in conjunction with the Department of the Environment and Energy (DEE), provides a *guide* to the assignation of site context scores. Note that 'local area' is defined as within a 15 km radius of the centre point of the study site. This is greater than the maximum distance of 12km known to be flown by Carnaby's Black-Cockatoo when feeding chicks in the nest.

Site Context Score	Percentage of the existing native vegetation within the 'local' area that the study site represents.	
	'Local' breeding known/likely	'Local' breeding unlikely
3	> 5%	> 10%
2	1 - 5%	5 - 10%
1	0.1 - 1%	1 - 5%
0	< 0.1%	< 1%

The table above provides weighting for where nearby breeding is known (or suspected) and for the proportion of foraging habitat within 15 km represented by the site being assessed. Some adjustments may be needed based on the judgement of the assessor and in relation to the likely function of the site. For example, a small area of foraging habitat (e.g. 0.5% of such habitat within 15 km) could be upgraded to a context of 2 if it formed part of a critical movement corridor. In contrast, the same sized area of habitat, of the same local proportion, could be downgraded if it were so isolated that birds could never access it.

B. Species density (stocking rate).

Species stocking rate is described as "the usage and/or density of a species at a particular site" in the offsets guide. The description also implies that a site supports a discrete population, which is unlikely in the case of very mobile black-cockatoos. Assignation of the species density score (0 or 1) is based upon the black-cockatoo species being either abundant or not abundant. A score of 1 is used where the species is seen or reported regularly and/or there is abundant foraging evidence. Regularly is when the species is seen at intervals of every few days or weeks for at least several months of the year. A score of 0 is used when the species is recorded or reported very infrequently and there is little or no foraging evidence. Where information on actual presence of birds is lacking, a species density score can be assigned by interpreting the landscape and the site context. For example, a site with a moderate condition score that is part of a network of such habitat where a black-cockatoo species is known would get a species density score of 1 even without clear presence data, while a species density score of 0 can be assigned to a site where the level of usage can confidently be predicted to be low.

C. Moderation of scores for the calculation of a value out of 10.

The calculation out of 10 requires the vegetation characteristics (out of 6) to be combined with the scores given for context and species density. It is considered that the context and density scores are not independent of vegetation characteristics; otherwise habitat of absolutely no value for black-cockatoo foraging (such as concrete or a wetland) could get a foraging score out of 10 as high as 4 if it occurred in an area where the species breed (context score of 3) and are abundant (species density score of 1). Similarly, vegetation of negligible or low characteristics which could not support black-cockatoos could be assigned a score as high as 6 out of 10. In that case, the score of 6 would be more a reflection of nearby vegetation of high characteristics than of the foraging value of the negligible to low scoring vegetation. The Black-Cockatoos would only be present because of vegetation of high characteristics, so applying the context and species density scores to vegetation of low characteristics would not give a true reflection of their foraging value.

For this reason, the context and species density scores need to be moderated for the vegetation characteristic score to prevent vegetation of little or no foraging value receiving an excessive score out of 10. A simple approach is to assign a context and species density score of zero to sites with a condition score of low (2), negligible (1) or none (0), on the basis that birds will not use such areas unless they are adjacent to at least low-moderate quality foraging habitat ($\geq$3). The approach to calculating a score out of 10 can be summarised as follows:

Vegetation composition, condition and structure score	Context score	Species density score
3-6 (low/moderate to high value)	Assessed as per B above	Assessed as per C above
0-2 (no to low value)	0	0

Note that this moderation approach may require interpretation depending on the context. For example, vegetation with a condition score of 2 could be given a context score of 1 under special circumstances. Such as when very close to a major breeding area or if strategically located along a movement corridor.

Pine plantations

Pine plantations are an important foraging resource for Carnaby's Black-Cockatoo (only) but are not directly comparable with native vegetation. In comparing native vegetation with pine plantations for the purpose of calculating offsets, the following should be noted:

- Pine plantations are a commercial crop established with the intention of being harvested and thus have short-term availability (30-50 years), whereas native vegetation is available indefinitely if protected. Due to the temporary nature of pines as a food source, site condition and context differs between pines and native vegetation.
- Although pines provide a high abundance of food in the form of seeds, they are a limited food resource compared with native vegetation which provides seeds, insect larvae, flowers and nectar. The value of insect larvae in the diet of Carnaby's Black-Cockatoo has not been quantified, but in the vicinity of Perth, the birds forage very heavily on insect larvae in young cones of *Banksia attenuata* in winter, ignoring the seeds in these cones and seeds in older cones on the same trees (Scott and Black 1981; M. Bamford pers. obs.). This suggests that insect larvae are of high nutritional importance immediately prior to the breeding season.

- Pine plantations have very little biodiversity value other than their importance as a food source for Carnaby's Black-Cockatoos. They inhibit growth of other flora. While this is not a factor for direct consideration with respect to Carnaby's Black-Cockatoo, it is a factor in regional conservation planning of which offsets for the cockatoos are a part.

Taking the above points into consideration, it is possible to assign pine plantations a foraging value as follows:

- Site condition. The actual foraging value of pines is high. Stock *et al.* (2013) report that it takes nearly twice as many seeds of *Pinus pinaster* to meet the daily energy requirements for Carnaby's Black-Cockatoo compared with Marri, and 3 times as many *P. pinaster* seeds compared with Slender Banksia. However, pines are planted at a high density so the food supply per hectare can be high. Taking account of the lack of variety of food from pines, this suggests a site condition score of 4 or 5 out of 6 (5 is used in Section A above). As a source of food, pines are thus comparable to the best banksia woodland. This site condition score then needs to be adjusted to take account of the short-term nature of the food supply (for pine plantations to be harvested. Where pines are 'ornamental', such as in some urban contexts, they can be treated as with other trees in urban landscapes). The foraging value of a site after pines are harvested will effectively be 0, or possibly 1 if there is some retention. It is proposed that this should approximately halve the site condition score; young pine plantations could be redacted slightly less than old plantations on the basis that a young plantation provides a slightly longer term food supply. If a maximum site condition score of 5 is given, then a young plantation (>10 but <30 years old) could be assigned a score of 3, and an old plantation (>30 years old) could be assigned a score of 2. Plantations <10 years old and thus not producing large quantities of cones could also get a score of 2, but recognising they may increase in value.
- Site context. Although a temporary food source, pines can be very important for Carnaby's Black-Cockatoo in some contexts; they could be said to carry populations in areas where there is little native vegetation. The system for assigning a context score as outlined above (Section B) also applies to pines. Thus, a context score of 3 can be given where pines are a significant proportion of foraging habitat (>5% if breeding occurs; >10% if no breeding), but where pines are a small part of the foraging landscape they will receive a context score of less than this.
- Species density. As outlined above (Section C), pines will receive a species density score of 1 where Carnaby's Black-Cockatoo are regular visitors. This is irrespective of an old plantation having a moderated condition score of 2.

Based on the above, pine plantations that represent a substantial part of the foraging landscape, such as in the region immediately north of Perth, would receive a total score (out of 10) of 6; young plantations in this area would receive a score of 7. In contrast, isolated and small plantations in rural landscapes could receive a score of just 2 if they are only a small proportion of foraging habitat and Carnaby's Black-Cockatoos are not regularly present.

Appendix 6 Habitat Scoring System for Western Ringtail Possum (DCCEEW 2024c)

Indicator/s	Score	Description
Site condition (habitat quality)		
Vegetation condition and structure Diversity of habitat species present Habitat features	3	**Very High** – High (90-100%) canopy[1] continuity[2] for movement, ground cover for shelter, fire age >20 years, evidence of many nests/dreys/hollows, limited evidence of predators.
	2.5	**High** – High (70-89%) canopy continuity for movement, ground cover, fire age >15 years, evidence of many nests/dreys/hollows, limited evidence of predators.
	2	**Medium** – High (70-89%) canopy continuity for movement, some ground cover, fire age >10 years, evidence of some nests/dreys/hollows, some evidence of predators.
	1.5	**Low** – Some canopy (50-69%) continuity for movement, some ground cover, fire age <10 years, evidence of few nests/dreys/hollows, substantial evidence of predators.
	1.0	**Very Low** – Little canopy (30-49%) continuity for movement, little ground cover, fire age <5 years, little evidence of nests/dreys/hollows, substantial evidence of predators.
	0.5	**Marginal** – Less than 30% canopy continuity for movement, no ground cover, fire within last 5 years, no evidence of nests/dreys/hollows.
	0	**Absent** – no vegetation and/or suitable habitat on site.
Site context		
Movement patterns Proximity of the site in relation to other areas of suitable habitat Overall population or extent of a species	3	Site is connected by vegetation, including continuous canopy cover, to more than one area of contiguous[3] suitable habitat. Site is within a key management zone.
	2.5	Site is connected by vegetation, including high canopy cover (70-89%), to at least one area of contiguous suitable habitat. Site is within a key management zone.
	2	Site is connected by vegetation, including some level of canopy cover (50-69%), to more than one patch[4] of suitable habitat. Site is within a key management zone.
	1.5	Site is connected by vegetation, including limited canopy cover (30-49%), to at least one patch of suitable habitat. Records on or immediately adjacent (<500 m) to site within last 2 years. Site is located within known species distribution.
	1	Site is separated from other known suitable habitat by cleared areas or linear barrier of up to 25 m. Records on site or immediately adjacent (within 500 m) within last 3 years. Site is located within known distribution of species.
	0.5	Site is separated from other suitable habitat by cleared areas or linear barrier of up to 50 m. Records on site or adjacent (within 1 km) within last 10 years. Site is not located within known distribution of species.
	0	Site is separated from other suitable habitat by cleared areas of more than 50 m. No records on site or adjacent (within 1 km) within last 10 years. Site is not located within known distribution of species.
Species stocking rate		
Usage and/or density of a species Role of the site population regarding overall species population viability	4	Record of species presence on site in last 12 months (WRP observed on site in last 12 months and scats; evidence of nests/dreys/hollows being used; evidence of breeding); site is within 50-100 m of verified/published records in last 12 months.
	3	Record of species presence on site in last 2 years (WRP observed on site in last 2 years and scats; evidence of nests/dreys/hollows being used); site is within 100-150 m of verified/published records in last 12 months.
	2	Record of species presence on site in last 2 years (WRP observed on site in last 2 years and scats; evidence of nests/dreys/hollows being used); site is within 150-200 m of verified/published records in last 2 years.
	1	Record of species presence on site in last 2 years (WRP observed on site in last 2 years and scats; evidence of nests/dreys/hollows being used); site is within 150-200 m of verified/published records in last 2 years.
	0	No record of species presence on site, or within 500 m in last 3 years.

1 - canopy refers to upper and/or mid storey.

[2]continuity means canopy where tree or shrub branches are touching allowing for WRP to move from one tree to another while staying under cover. High canopy continuity means a high percentage of trees or shrubs connect; low canopy continuity means few or no trees or shrubs connect.

[3]Contiguous suitable habitat means multiple patches of native vegetation sharing borders, next to each other in sequence, comprising a larger, continuous area.

[4]A patch of suitable habitat may or may not be connected to other patches of native vegetation. Patch size is not defined and should be considered in relation to site condition and species stocking rate as indicators of patch viability for WRP.

Appendix 7 Vertebrate fauna desktop and field survey results

Family	Species	Vernacular	Status	Biota (2009)	Birdata (Birdlife Australia 2023)	NatureMap (DBCA 2023b)	ELM (2017)	PM[1] (DCCEEW 2023a)	Harewood (2018)	LEC (1990)	Litoria Ecoservices (2017)	Ninox (2011)	TPFA[2] (DBCA 2023c)	BBRAS (Phoenix 2025a)	This survey
Amphibians (14)															
Hylidae	*Litoria adelaidensis*	Slender Tree Frog													•
Hylidae	*Litoria moorei*	Motorbike Frog		•		•						•			•
Limnodynastidae	*Heleioporus eyrei*	Moaning Frog		•		•						•			
Limnodynastidae	*Heleioporus psammophilus*	Sand Frog													•
Limnodynastidae	*Limnodynastes dorsalis*	Western Banjo Frog		•											•
Limnodynastidae	*Neobatrachus albipes*	White-footed Trilling Frog				•									
Myobatrachidae	*Anstisia alba*	White-bellied Frog	CR (EPBC & BC Acts)			•		•					•		
Myobatrachidae	*Anstisia vitellina*	Orange-bellied Frog	VU (EPBC & BC Acts)			•		•					•		
Myobatrachidae	*Crinia georgiana*	Quacking Frog		•		•						•			•
Myobatrachidae	*Crinia glauerti*	Clicking Frog				•									•
Myobatrachidae	*Crinia pseudinsignifera*	Bleating Froglet				•									•
Myobatrachidae	*Geocrinia leai*	Ticking Frog				•									•
Myobatrachidae	*Metacrinia nichollsi*	Forest Toadlet				•									
Myobatrachidae	*Pseudophryne guentheri*	Crawling Toadlet				•									•
Birds (207)															
Accipitridae	*Aquila audax*	Wedge-tailed Eagle			•	•				•		•		•	•
Accipitridae	*Circus approximans*	Swamp Harrier		•	•					•		•		•	•
Accipitridae	*Elanus axillaris*	Black-shouldered Kite			•	•						•		•	•
Accipitridae	*Haliaeetus leucogaster*	White-bellied Sea-eagle			•	•		•		•		•		•	
Accipitridae	*Haliastur sphenurus*	Whistling Kite			•	•						•		•	•
Accipitridae	*Hamirostra isura*	Square-tailed Kite			•										
Accipitridae	*Hieraaetus morphnoides*	Little Eagle			•	•								•	•
Accipitridae	*Milvus migrans*	Black Kite			•	•									
Accipitridae	*Tachyspiza cirrocephala*	Collared Sparrowhawk			•	•						•		•	
Accipitridae	*Tachyspiza fasciata*	Brown Goshawk			•	•						•		•	•
Pandionidae	*Pandion haliaetus*	Osprey	Mig. (EPBC & BC Acts)		•	•		•				•	•	•	•
Anatidae	*Anas castanea*	Chestnut Teal										•			•
Anatidae	*Anas gracilis*	Grey Teal			•	•						•		•	•
Anatidae	*Anas superciliosa*	Pacific Black Duck			•	•				•		•		•	•
Anatidae	*Aythya australis*	Hardhead			•	•						•			
Anatidae	*Biziura lobata*	Musk Duck			•	•						•		•	•

Family	Species	Vernacular	Status	Biota (2009)	Birdata (Birdlife Australia 2023)	NatureMap (DBCA 2023b)	ELM (2017)	PM[1] (DCCEEW 2023a)	Harewood (2018)	LEC (1990)	Litoria Ecoservices (2017)	Ninox (2011)	TPFA[2] (DBCA 2023c)	BBRAS (Phoenix 2025a)	This survey
Anatidae	*Chenonetta jubata*	Australian Wood Duck			•	•				•		•		•	•
Anatidae	*Cygnus atratus*	Black Swan		•	•	•						•		•	•
Anatidae	*Malacorhynchus membranaceus*	Pink-eared Duck										•			•
Anatidae	*Oxyura australis*	Blue-billed Duck	P4 (DBCA list)		•	•						•	•		
Anatidae	*Spatula rhynchotis*	Australasian Shoveler			•	•						•			•
Anatidae	*Tadorna tadornoides*	Australian Shelduck		•	•	•				•		•		•	•
Apodidae	*Apus pacificus*	Fork-tailed Swift	Mig. (EPBC & BC Acts)					•							
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar			•	•				•					
Podargidae	*Podargus strigoides*	Tawny Frogmouth			•	•				•					•
Charadriidae	*Anarhynchus bicinctus*	Double-banded Plover	Mig. (EPBC & BC Acts)										•		
Charadriidae	*Anarhynchus leschenaultii*	Greater Sand Plover	VU/Mig. (EPBC Act); VU (BC Act)		•			•					•		
Charadriidae	*Anarhynchus mongolus*	Siberian Sand Plover	EN/Mig. (EPBC Act); EN (BC Act)										•		
Charadriidae	*Anarhynchus ruficapillus*	Red-capped Plover		•	•	•		•				•		•	
Charadriidae	*Charadrius cucullatus*	Hooded Plover/Dotterel	P4 (DBCA list)		•	•		•					•		
Charadriidae	*Charadrius melanops*	Black-fronted Dotterel			•							•			•
Charadriidae	*Pluvialis fulva*	Pacific Golden Plover	Mig. (EPBC & BC Acts)		•			•					•		
Charadriidae	*Pluvialis squatarola*	Grey Plover	VU/Mig. (EPBC Act); Mig. (BC Act)		•										
Charadriidae	*Vanellus tricolor*	Banded Lapwing			•	•						•		•	•
Haematopodidae	*Haematopus fuliginosus*	Sooty Oystercatcher			•										
Haematopodidae	*Haematopus longirostris*	Pied Oystercatcher		•	•	•								•	
Laridae	*Anous tenuirostris melanops*	Australian Lesser Noddy	VU (EPBC Act); EN (BC Act)					•							
Laridae	*Chlidonias hybrida*	Whiskered Tern			•										
Laridae	*Chroicocephalus novaehollandiae*	Silver Gull		•	•	•						•		•	
Laridae	*Hydroprogne caspia*	Caspian Tern	Mig. (EPBC & BC Acts)		•	•		•				•	•	•	
Laridae	*Larus dominicanus*	Kelp Gull			•										
Laridae	*Larus pacificus*	Pacific Gull		•	•	•		•						•	
Laridae	*Onychoprion anaethetus*	Bridled Tern	Mig. (EPBC & BC Acts)		•			•					•		
Laridae	*Stercorarius pomarinus*	Pomarine Skua (Pomarine Jaeger)	Mig. (EPBC & BC Acts)		•										
Laridae	*Sternula nereis nereis*	Fairy Tern	VU (EPBC & BC Acts)		•	•		•						•	
Laridae	*Thalasseus bergii*	Greater Crested Tern	Mig. (EPBC & BC Acts)		•	•							•	•	
Recurvirostridae	*Cladorhynchus leucocephalus*	Banded Stilt			•										
Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt			•							•			
Recurvirostridae	*Recurvirostra novaehollandiae*	Red-necked Avocet			•	•									
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	Mig. (EPBC & BC Acts)		•			•				•	•		

Family	Species	Vernacular	Status	Biota (2009)	Birdata (Birdlife Australia 2023)	NatureMap (DBCA 2023b)	ELM (2017)	PM[1] (DCCEEW 2023a)	Harewood (2018)	LEC (1990)	Litoria Ecoservices (2017)	Ninox (2011)	TPFA[2] (DBCA 2023c)	BBRAS (Phoenix 2025a)	This survey
Scolopacidae	*Arenaria interpres*	Ruddy Turnstone	VU/Mig. (EPBC Act); Mig. (BC Act)		•								•		
Scolopacidae	*Calidris acuminata*	Sharp-tailed Sandpiper	VU/Mig. (EPBC Act); Mig. (BC Act)					•				•	•	•	
Scolopacidae	*Calidris alba*	Sanderling	Mig. (EPBC & BC Acts)		•	•		•					•	•	
Scolopacidae	*Calidris canutus*	Red Knot	VU/Mig. (EPBC Act); EN (BC Act)		•			•					•		
Scolopacidae	*Calidris falcinellus*	Broad-billed Sandpiper	Mig. (EPBC & BC Acts)		•								•		
Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	CR/Mig. (EPBC Act); CR (BC Act)		•			•					•		
Scolopacidae	*Calidris melanotos*	Pectoral Sandpiper	Mig. (EPBC & BC Acts)		•			•							
Scolopacidae	*Calidris ruficollis*	Red-necked Stint	Mig. (EPBC & BC Acts)		•			•					•	•	
Scolopacidae	*Calidris tenuirostris*	Great Knot	CR/Mig. (EPBC Act); CR (BC Act)		•			•					•		
Scolopacidae	*Limosa lapponica*	Bar-tailed Godwit	Mig. (EPBC & BC Acts)		•			•					•	•	
Scolopacidae	*Limosa limosa*	Black-tailed Godwit	EN/Mig. (EPBC Act); Mig. (BC Act)		•								•		
Scolopacidae	*Numenius madagascariensis*	Eastern Curlew	CR/Mig./CR (EPBC Act; BC Act)					•					•		
Scolopacidae	*Numenius phaeopus*	Whimbrel	Mig. (EPBC & BC Acts)		•								•		
Scolopacidae	*Tringa brevipes*	Grey-tailed Tattler	Mig. (EPBC & BC Acts) P4 (DBCA list)										•		
Scolopacidae	*Tringa glareola*	Wood Sandpiper	Mig. (EPBC & BC Acts)		•										•
Scolopacidae	*Tringa nebularia*	Common Greenshank	EN/Mig. (EPBC Act); Mig. (BC Act)		•	•		•				•	•		
Scolopacidae	*Tringa stagnatilis*	Marsh Sandpiper	Mig. (EPBC & BC Acts)		•										
Ardeidae	*Ardea alba*	Great Egret (Eastern Great Egret)			•	•						•			
Ardeidae	*Ardea pacifica*	White-necked Heron			•	•				•		•		•	•
Ardeidae	*Botaurus poiciloptilus*	Australasian Bittern	EN (EPBC & BC Acts)					•							
Ardeidae	*Bubulcus coromandus*	Cattle Egret			•			•							•
Ardeidae	*Egretta garzetta*	Little Egret			•									•	
Ardeidae	*Egretta novaehollandiae*	White-faced Heron			•	•				•		•		•	•
Ardeidae	*Egretta sacra*	Eastern Reef Egret			•										
Ardeidae	*Ixobrychus flavicollis*	Black Bittern			•	•									
Ardeidae	*Nycticorax caledonicus*	Rufous Night Heron			•	•									
Threskiornithidae	*Platalea flavipes*	Yellow-billed Spoonbill			•	•						•		•	•
Threskiornithidae	*Platalea regia*	Royal Spoonbill			•	•				•				•	
Threskiornithidae	*Threskiornis molucca*	Australian White Ibis		•	•	•						•		•	•
Threskiornithidae	*Threskiornis spinicollis*	Straw-necked Ibis		•	•	•				•		•		•	•
Columbidae	*Ocyphaps lophotes*	Crested Pigeon			•	•						•		•	•
Columbidae	*Phaps chalcoptera*	Common Bronzewing		•	•	•			•	•		•		•	•
Columbidae	*Phaps elegans*	Brush Bronzewing			•	•									
Halcyonidae	*Dacelo novaeguineae*	Laughing Kookaburra	Introduced	•	•	•			•	•		•		•	•

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Halcyonidae	*Todiramphus sanctus*	Sacred Kingfisher			•	•				•					•
Meropidae	*Merops ornatus*	Rainbow Bee-eater		•	•	•		•							•
Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo			•	•				•		•		•	
Cuculidae	*Chalcites basalis*	Horsfield's Bronze Cuckoo		•	•					•		•		•	•
Cuculidae	*Chalcites lucidus*	Shining Bronze Cuckoo		•	•					•		•		•	•
Cuculidae	*Heteroscenes pallidus*	Pallid Cuckoo			•	•				•		•			
Falconidae	*Falco berigora*	Brown Falcon			•	•				•		•		•	•
Falconidae	*Falco cenchroides*	Australian Kestrel		•	•	•				•		•		•	•
Falconidae	*Falco longipennis*	Australian Hobby		•	•	•				•		•		•	
Falconidae	*Falco peregrinus*	Peregrine Falcon	OS (BC Act)		•	•				•		•	•	•	
Megapodiidae	*Leipoa ocellata*	Malleefowl	VU (EPBC & BC Acts)			•							•		
Phasianidae	*Coturnix pectoralis*	Stubble Quail			•	•						•		•	•
Phasianidae	*Synoicus ypsilophorus*	Brown Quail			•	•				•					
Rallidae	*Fulica atra*	Eurasian Coot			•	•						•			•
Rallidae	*Gallinula tenebrosa*	Dusky Moorhen			•	•									
Rallidae	*Porphyrio melanotus*	Australasian Swamphen			•	•						•			•
Rallidae	*Zapornia pusilla*	Baillon's Crake			•	•									
Rallidae	*Zapornia tabuensis*	Spotless Crake			•	•						•			
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill		•	•	•				•		•		•	•
Acanthizidae	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill		•	•	•				•		•		•	•
Acanthizidae	*Acanthiza inornata*	Western Thornbill			•	•				•		•			
Acanthizidae	*Gerygone fusca*	Western Gerygone		•	•	•				•				•	•
Acanthizidae	*Sericornis maculatus*	Spotted Scrubwren		•	•	•			•	•		•		•	•
Acanthizidae	*Smicrornis brevirostris*	Weebill			•	•									•
Artamidae	*Artamus cinereus*	Black-faced Woodswallow			•	•				•		•		•	•
Artamidae	*Artamus cyanopterus*	Dusky Woodswallow			•	•				•		•		•	
Artamidae	*Cracticus nigrogularis*	Pied Butcherbird													•
Artamidae	*Cracticus torquatus*	Grey Butcherbird		•	•	•				•		•		•	•
Artamidae	*Gymnorhina tibicen*	Australian Magpie		•	•	•				•		•		•	•
Artamidae	*Strepera versicolor*	Grey Currawong		•	•	•				•					
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike		•	•	•				•		•		•	•
Campephagidae	*Lalage tricolor*	White-winged Triller			•					•		•		•	•
Climacteridae	*Climacteris rufus*	Rufous Treecreeper			•	•									•
Corvidae	*Corvus coronoides*	Australian Raven		•	•	•				•		•		•	•

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Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird													•
Dicruridae	*Grallina cyanoleuca*	Magpie-lark			•	•				•		•		•	•
Dicruridae	*Rhipidura albiscapa*	Grey Fantail		•	•	•			•	•		•		•	•
Dicruridae	*Rhipidura leucophrys*	Willie Wagtail		•	•	•				•		•		•	•
Estrildidae	*Stagonopleura oculata*	Red-eared Firetail			•	•				•					
Hirundinidae	*Hirundo neoxena*	Welcome Swallow		•	•	•				•		•		•	•
Hirundinidae	*Petrochelidon ariel*	Fairy Martin			•	•									
Hirundinidae	*Petrochelidon nigricans*	Tree Martin		•	•	•				•		•		•	•
Locustellidae	*Cincloramphus cruralis*	Brown Songlark								•				•	•
Locustellidae	*Cincloramphus mathewsi*	Rufous Songlark								•				•	
Locustellidae	*Poodytes gramineus*	Little Grassbird			•	•				•		•			
Maluridae	*Malurus elegans*	Red-winged Fairy-wren		•	•	•			•	•				•	•
Maluridae	*Malurus splendens*	Splendid Fairy-wren		•	•	•				•		•		•	•
Maluridae	*Stipiturus malachurus*	Southern Emu-wren			•	•				•		•		•	
Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill			•	•				•		•		•	•
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird		•	•	•			•	•		•		•	•
Meliphagidae	*Anthochaera lunulata*	Western Little Wattlebird		•	•	•				•		•			
Meliphagidae	*Epthianura albifrons*	White-fronted Chat			•	•				•		•		•	•
Meliphagidae	*Gavicalis virescens*	Singing Honeyeater		•	•	•									•
Meliphagidae	*Gliciphila melanops*	Tawny-crowned honeyeater			•	•				•					
Meliphagidae	*Lichmera indistincta*	Brown Honeyeater			•	•				•				•	•
Meliphagidae	*Manorina flavigula*	Yellow-throated Miner													•
Meliphagidae	*Melithreptus chloropsis*	Western White-naped Honeyeater			•	•				•		•			
Meliphagidae	*Phylidonyris niger*	White-cheeked Honeyeater			•	•				•					
Meliphagidae	*Phylidonyris novaehollandiae*	New Holland Honeyeater		•	•	•				•		•		•	•
Motacillidae	*Anthus australis*	Australian Pipit		•	•					•		•		•	•
Motacillidae	*Motacilla cinerea*	Grey Wagtail	Mig. (EPBC & BC Acts)					•							
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella			•	•				•					
Pachycephalidae	*Colluricincla harmonica*	Grey Shrike-thrush		•	•	•				•				•	•
Pachycephalidae	*Pachycephala fuliginosa*	Western Whistler		•	•	•				•		•		•	•
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler			•	•				•		•			•
Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote		•	•	•				•					•
Pardalotidae	*Pardalotus striatus*	Striated Pardalote		•	•	•				•				•	•
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin		•	•	•									

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Petroicidae	*Microeca fascinans*	Jacky Winter												•	
Petroicidae	*Petroica boodang*	Scarlet Robin		•	•	•				•		•		•	
Petroicidae	*Petroica goodenovii*	Red-capped Robin			•										
Petroicidae	*Quoyornis georgianus*	White-breasted Robin		•	•	•				•		•			•
Sylviidae	*Acrocephalus australis*	Australian Reed Warbler			•	•						•			
Zosteropidae	*Zosterops lateralis*	Silvereye		•	•	•			•	•		•		•	•
Anhingidae	*Anhinga novaehollandiae*	Australasian Darter			•	•						•		•	
Pelecanidae	*Pelecanus conspicillatus*	Australian Pelican			•	•						•		•	
Phalacrocoracidae	*Microcarbo melanoleucos*	Little Pied Cormorant			•	•				•				•	•
Phalacrocoracidae	*Phalacrocorax carbo*	Great Cormorant			•	•						•		•	
Phalacrocoracidae	*Phalacrocorax sulcirostris*	Little Black Cormorant			•	•						•		•	•
Phalacrocoracidae	*Phalacrocorax varius*	Pied Cormorant			•	•						•		•	
Sulidae	*Morus serrator*	Australasian Gannet			•	•									
Podicipedidae	*Podiceps cristatus*	Great Crested Grebe										•			
Podicipedidae	*Poliocephalus poliocephalus*	Hoary-headed Grebe			•	•						•			
Podicipedidae	*Tachybaptus novaehollandiae*	Australasian Grebe			•	•						•			•
Diomedeidae	*Diomedea amsterdamensis*	Amsterdam Albatross	EN/Mig. (EPBC Act); CR/Mig. (BC Act)					•							
Diomedeidae	*Diomedea dabbenena*	Tristan Albatross	EN/Mig. (EPBC Act); CR/Mig. (BC Act)					•							
Diomedeidae	*Diomedea epomophora*	Southern Royal Albatross	VU/Mig. (EPBC & BC Acts)					•							
Diomedeidae	*Diomedea exulans*	Wandering Albatross	VU/Mig. (EPBC & BC Acts)					•					•		
Diomedeidae	*Diomedea sanfordi*	Northern Royal Albatross	EN/Mig. (EPBC Act; BC Act)					•							
Diomedeidae	*Phoebetria fusca*	Sooty Albatross	VU/Mig. (EPBC Act); EN/Mig. (BC Act)					•							
Diomedeidae	*Thalassarche carteri*	Indian Yellow-nosed Albatross	VU/Mig. (EPBC Act); EN/Mig. (BC Act)		•			•							
Diomedeidae	*Thalassarche cauta*	Shy Albatross	VU/Mig. (EPBC & BC Acts)					•							
Diomedeidae	*Thalassarche chlororhynchos*	Atlantic Yellow-nosed Albatross	VU/Mig. (BC Act)			•							•		
Diomedeidae	*Thalassarche impavida*	Campbell Albatross	VU/Mig. (EPBC & BC Acts)					•							
Diomedeidae	*Thalassarche melanophris*	Black-browed Albatross	VU/Mig. (EPBC Act); EN/Mig. (BC Act)					•					•		
Oceanitidae	*Pelagodroma marina*	White-faced Storm Petrel			•										
Procellariidae	*Ardenna carneipes*	Flesh-footed Shearwater	VU/Mig. (BC Act)					•							
Procellariidae	*Ardenna grisea*	Sooty Shearwater	Mig. (BC Act)					•							
Procellariidae	*Halobaena caerulea*	Blue Petrel	VU (EPBC Act)					•							
Procellariidae	*Macronectes giganteus*	Southern Giant Petrel	EN/Mig. (EPBC Act); Mig. (BC Act)					•							
Procellariidae	*Macronectes halli*	Northern Giant Petrel	VU/Mig. (EPBC Act); Mig. (BC Act)					•							
Procellariidae	*Pachyptila turtur*	Fairy Prion						•							

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Procellariidae	*Pterodroma mollis*	Soft-plumaged Petrel	VU (EPBC Act)					•							
Procellariidae	*Puffinus assimilis*	Little Shearwater						•							
Cacatuidae	*Cacatua sanguinea*	Little Corella													•
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo/Karrak	VU (EPBC & BC Acts)		•	•		•		•		•	•	•	•
Cacatuidae	*Calyptorhynchus* sp.	black cockatoo species	EN-VU (EPBC & BC Acts)		•										
Cacatuidae	*Calyptorhynchus/Zanda* sp.	black cockatoo species	EN-VU (EPBC & BC Acts)											•	•
Cacatuidae	*Eolophus roseicapilla*	Galah			•									•	•
Cacatuidae	*Zanda baudinii*	Baudin's Cockatoo	EN (EPBC & BC Acts)	•	•	•		•				•	•	•	•
Cacatuidae	*Zanda latirostris*	Carnaby's Cockatoo	EN (EPBC & BC Acts)	•	•	•		•					•	•	•
Cacatuidae	*Zanda* sp.	white-tailed black cockatoo species	EN (EPBC & BC Acts)	•		•				•			•	•	•
Psittaculidae	*Barnardius zonarius*	Australian Ringneck		•	•	•				•		•		•	•
Psittaculidae	*Neophema elegans*	Elegant Parrot			•	•				•		•		•	•
Psittaculidae	*Neophema petrophila*	Rock Parrot			•	•									
Psittaculidae	*Parvipsitta porphyrocephala*	Purple-crowned Lorikeet		•	•	•				•				•	•
Psittaculidae	*Platycercus icterotis*	Western Rosella		•	•	•				•		•		•	
Psittaculidae	*Purpureicephalus spurius*	Red-capped Parrot		•	•	•						•		•	
Strigidae	*Ninox boobook*	Boobook Owl			•	•								•	
Tytonidae	*Tyto javanica*	Eastern barn owl										•			•
Tytonidae	*Tyto novaehollandiae novaehollandiae*	Masked Owl (southwest)	P3 (DBCA list)		•									•	•
Dromaiidae	*Dromaius novaehollandiae*	Emu		•	•	•				•		•		•	•
Turnicidae	*Turnix varius*	Painted Button-quail										•			
Mammals (34)															
Bovidae	*Bos taurus*	European Cattle	Introduced	•											•
Suidae	*Sus scrofa*	Pig	Introduced												•
Canidae	*Canis familiaris*	Dog	Introduced												•
Canidae	*Vulpes vulpes*	Red Fox	Introduced	•		•			•			•			•
Felidae	*Felis catus*	Cat	Introduced												•
Molossidae	*Austronomus australis*	White-striped Free-tailed Bat										•		•	•
Molossidae	*Mormopterus kitcheneri*	South-western Free-tailed Bat										•			
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat		•								•		•	•
Vespertilionidae	*Chalinolobus morio*	Chocolate Wattled Bat		•		•						•		•	•
Vespertilionidae	*Falsistrellus mackenziei*	Western False Pipistrelle	P4 (DBCA list)	•		•						•	•	•	•
Vespertilionidae	*Nyctophilus geoffroyi*	Lesser Long-eared Bat												•	•
Vespertilionidae	*Nyctophilus gouldi*	Gould's Long-eared Bat				•									

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Vespertilionidae	*Nyctophilus holtorum*	Holt's Long-eared Bat												•	•
Vespertilionidae	*Nyctophilus major*	Greater Long-eared Bat												•	
Vespertilionidae	*Vespadelus regulus*	Southern Forest Bat		•		•						•		•	•
Dasyuridae	*Antechinus flavipes*	Yellow-footed Antechinus							•						
Dasyuridae	*Dasyurus geoffroii*	Chuditch	VU (EPBC & BC Acts)			•		•					•		
Dasyuridae	*Phascogale tapoatafa wambenger*	South-western Brush-tailed Phascogale	CD (BC Act)			•			•				•		
Dasyuridae	*Sminthopsis gilberti*	Gilbert's Dunnart				•									
Dasyuridae	*Sminthopsis griseoventer*	Grey-bellied Dunnart		•		•									
Myrmecobiidae	*Myrmecobius fasciatus*	Numbat	EN (EPBC & BC Acts)					•							
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo		•		•			•			•			•
Macropodidae	*Notamacropus irma*	Western Brush Wallaby	P4 (DBCA list)			•							•		
Macropodidae	*Setonix brachyurus*	Quokka	VU (EPBC & BC Acts)			•		•					•		
Phalangeridae	*Trichosurus vulpecula*	Common Brushtail Possum				•			•						
Potoroidae	*Bettongia penicillata ogilbyi*	Woylie	EN/CR (EPBC Act; BC Act)			•							•		
Pseudocheiridae	*Pseudocheirus occidentalis*	Western Ringtail Possum	CR (EPBC & BC Acts)	•		•	•	•	•		•		•		•
Tarsipedidae	*Tarsipes rostratus*	Honey Possum				•									
Leporidae	*Oryctolagus cuniculus*	Rabbit	Introduced	•											•
Peramelidae	*Isoodon fusciventer*	Quenda	P4 (DBCA list)			•			•			•	•		•
Muridae	*Hydromys chrysogaster*	Water-rat	P4 (DBCA list)			•							•		
Muridae	*Mus musculus*	House Mouse	Introduced	•		•			•			•			
Muridae	*Rattus fuscipes*	Western Bush Rat		•		•			•						
Muridae	*Rattus rattus*	Black Rat	Introduced	•		•			•			•			
Reptiles (25)															
Elapidae	*Echiopsis curta*	Bardick		•											
Elapidae	*Elapognathus coronatus*	Crowned Snake		•		•						•			
Elapidae	*Elapognathus minor*	Short-nosed Snake	P2 (DBCA list)			•							•		
Elapidae	*Notechis scutatus*	Tiger Snake		•		•						•			•
Elapidae	*Pseudonaja affinis*	Dugite		•		•						•			•
Elapidae	*Suta nigriceps*	Black-backed Hooded Snake				•									
Gekkonidae	*Christinus marmoratus*	Marbled Gecko		•		•						•			
Pygopodidae	*Aprasia pulchella*	Granite Worm-lizard				•									
Pygopodidae	*Pygopus lepidopodus*	Common Scaly-foot				•									
Scincidae	*Acritoscincus trilineatus*	Western Three-lined Skink		•		•						•			
Scincidae	*Ctenotus catenifer*	Chain-striped South-west Ctenotus				•									

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Scincidae	*Ctenotus labillardieri*	Red-legged Ctenotus		•		•									
Scincidae	*Egernia kingii*	King's Skink				•			•						•
Scincidae	*Egernia napoleonis*	Southwestern Crevice-skink		•		•									
Scincidae	*Hemiergis gracilipes*	South-western Mulch-skink				•									
Scincidae	*Hemiergis peronii*	Peron's Earless Skink		•		•									
Scincidae	*Lerista elegans*	Elegant Slider		•		•									
Scincidae	*Lerista microtis*	South Coast Five-toed Slider		•											
Scincidae	*Liopholis pulchra*	South-western Rock Skink				•									
Scincidae	*Morethia lineoocellata*	West Coast Pale-flecked Morethia		•		•									
Scincidae	*Morethia obscura*	Shrubland Pale-flecked Morethia		•											
Scincidae	*Tiliqua rugosa*	Bobtail		•		•						•			•
Typhlopidae	*Anilios australis*	Southern Blind Snake		•		•									
Varanidae	*Varanus rosenbergi*	Heath Monitor		•								•			•
Chelidae	*Chelodina oblonga*	South-western Long-necked Turtle													•

[1]PM – Protected Matters Database. [2]TPFA – Threatened and Priority Fauna Database. [3]Species only recorded at regional BBRAS sites and not in study area. [4]Could represent red- or white-tailed black cockatoo as some desktop records predate taxonomic revision of Carnaby's and Baudins into *Zanda* genus.

Appendix 8 Detailed black cockatoo records

Audio recording data summary

Site name	Record type	Forest Red-tailed Black Cockatoo		White-tailed black cockatoo		Total	
		Aggregate minutes	# detects.	Aggregate minutes	# detects.	Aggregate mins. / hrs.	# detects.
SM4-01	Flyover	0	4	0	7	**300 mins. 5 hrs.**	**19**
	Foraging	18	1	282	12		
SM4-02	Flyover	0	3	0	9	**225 mins. 3.75 hrs.**	**17**
	Foraging	24	2	201	8		
SM4-04	Flyover	0	0	1	16	**56 mins. 0.93 hrs.**	**19**
	Foraging	0	0	55	3		
SM4-05	Flyover	0	0	1	11	**19 mins. 0.32 hrs.**	**13**
	Foraging	0	0	18	2		
SM4-06	Flyover	0	1	0	1	**13 mins. 0.22 hrs.**	**2**
	Foraging	0	0	13	1		
SM4-07	Flyover	0	1	1	12	**1 min.**	**12**
Total		**42**	**12**	**572**	**82**	**614 mins. 10.2 hrs.**	**94**

Black cockatoo species records per season and phase

Name	Vernacular	Season	Date	Abundance
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Autumn	2023-05-25	53
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Autumn	2023-05-26	3
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Winter	2023-08-14	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Winter	2023-08-15	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Winter	2023-08-15	7
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Winter	2023-08-16	8
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Winter	2023-08-16	6
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Winter	2023-08-28	3
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Winter	2023-08-28	10
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Winter	2023-08-30	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Winter	2023-08-30	2
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Winter	2023-08-31	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Winter	2023-08-31	17
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Spring	2023-10-27	4
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Spring	2023-11-18	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2023-12-06	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2023-12-08	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2023-12-08	1

Name	Vernacular	Season	Date	Abundance
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2023-12-09	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2023-12-10	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2023-12-10	2
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2023-12-11	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2023-12-11	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Spring	2024-11-27	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Spring	2024-11-27	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Spring	2024-11-28	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Spring	2024-11-29	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Spring	2024-11-29	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2024-12-04	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2024-12-04	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2024-12-04	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2024-12-09	2
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2024-12-09	2
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2024-12-12	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2024-12-13	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2024-12-23	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2024-12-25	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2024-12-28	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2024-12-31	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2024-12-31	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2025-01-04	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2025-01-04	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2025-01-10	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2025-01-14	1
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo/Karrak	Summer	2025-01-15	1
Calyptorhynchus/Zanda sp.	black cockatoo species	Spring	2024-09-27	38
Calyptorhynchus/Zanda sp.	black cockatoo species	Spring	2024-09-29	2
Calyptorhynchus/Zanda sp.	black cockatoo species	Spring	2024-09-29	4
Calyptorhynchus/Zanda sp.	black cockatoo species	Spring	2024-09-29	2
Calyptorhynchus/Zanda sp.	black cockatoo species	Spring	2024-09-29	7
Calyptorhynchus/Zanda sp.	black cockatoo species	Spring	2024-09-30	6
Calyptorhynchus/Zanda sp.	black cockatoo species	Spring	2024-10-21	1
Calyptorhynchus/Zanda sp.	black cockatoo species	Spring	2024-10-28	4
Calyptorhynchus/Zanda sp.	black cockatoo species	Spring	2024-11-14	2
Calyptorhynchus/Zanda sp.	black cockatoo species	Spring	2024-11-14	10
Calyptorhynchus/Zanda sp.	black cockatoo species	Spring	2024-11-18	2

Name	Vernacular	Season	Date	Abundance
Calyptorhynchus/Zanda sp.	black cockatoo species	Spring	2024-11-25	1
Calyptorhynchus/Zanda sp.	black cockatoo species	Summer	2024-12-02	4
Calyptorhynchus/Zanda sp.	black cockatoo species	Summer	2024-12-04	1
Calyptorhynchus/Zanda sp.	black cockatoo species	Summer	2024-12-04	1
Calyptorhynchus/Zanda sp.	black cockatoo species	Summer	2024-12-11	2
Calyptorhynchus/Zanda sp.	black cockatoo species	Summer	2025-01-13	6
Calyptorhynchus/Zanda sp.	black cockatoo species	Summer	2025-01-17	6
Zanda baudinii	Baudin's Cockatoo	Autumn	2023-05-26	1
Zanda baudinii	Baudin's Cockatoo	Winter	2023-08-15	26
Zanda baudinii	Baudin's Cockatoo	Spring	2023-10-25	10
Zanda baudinii	Baudin's Cockatoo	Spring	2023-11-19	8
Zanda baudinii	Baudin's Cockatoo	Summer	2023-12-07	9
Zanda baudinii	Baudin's Cockatoo	Summer	2023-12-07	1
Zanda baudinii	Baudin's Cockatoo	Spring	2024-09-30	2
Zanda latirostris	Carnaby's Cockatoo	Winter	2023-08-29	12
Zanda latirostris	Carnaby's Cockatoo	Winter	2023-08-30	1
Zanda latirostris	Carnaby's Cockatoo	Winter	2023-08-30	12
Zanda latirostris	Carnaby's Cockatoo	Winter	2023-08-30	4
Zanda latirostris	Carnaby's Cockatoo	Winter	2023-08-31	1
Zanda latirostris	Carnaby's Cockatoo	Summer	2023-12-07	1
Zanda latirostris	Carnaby's Cockatoo	Summer	2023-12-07	1
Zanda latirostris	Carnaby's Cockatoo	Summer	2023-12-07	1
Zanda latirostris	Carnaby's Cockatoo	Summer	2023-12-08	4
Zanda latirostris	Carnaby's Cockatoo	Summer	2023-12-09	3
Zanda latirostris	Carnaby's Cockatoo	Summer	2023-12-11	1
Zanda latirostris	Carnaby's Cockatoo	Summer	2024-01-11	10
Zanda latirostris	Carnaby's Cockatoo	Summer	2024-01-12	5
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-09-30	1
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-09-30	2
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-10-17	6
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-10-17	12
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-10-17	6
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-10-17	1
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-10-17	1
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-10-17	2
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-10-18	2
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-10-18	2
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-10-18	9

Name	Vernacular	Season	Date	Abundance
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-10-18	2
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-11-13	1
Zanda latirostris	Carnaby's Cockatoo	Spring	2024-11-14	3
Zanda latirostris	Carnaby's Cockatoo	Summer	2024-12-09	2
Zanda latirostris	Carnaby's Cockatoo	Summer	2024-12-09	2
Zanda latirostris	Carnaby's Cockatoo	Summer	2025-01-16	20
Zanda latirostris	Carnaby's Cockatoo	Summer	2025-01-17	2
Zanda latirostris	Carnaby's Cockatoo	Summer	2025-01-17	4
Zanda latirostris	Carnaby's Cockatoo	Summer	2025-01-17	2
Zanda latirostris	Carnaby's Cockatoo	Summer	2025-01-17	2
Zanda latirostris	Carnaby's Cockatoo	Autumn	2025-03-07	6
Zanda latirostris	Carnaby's Cockatoo	Autumn	2025-03-07	4
Zanda sp.	white-tailed black cockatoo species	Winter	2023-08-15	6
Zanda sp.	white-tailed black cockatoo species	Winter	2023-08-15	26
Zanda sp.	white-tailed black cockatoo species	Winter	2023-08-30	2
Zanda sp.	white-tailed black cockatoo species	Summer	2024-01-11	3
Zanda sp.	white-tailed black cockatoo species	Spring	2024-11-29	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-11-29	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-01	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-01	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-01	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-01	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-01	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-01	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-01	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-03	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-04	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-04	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-04	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-04	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-06	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-06	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-08	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-08	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-09	1

Name	Vernacular	Season	Date	Abundance
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-10	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-10	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-10	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-10	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-10	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-11	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-13	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-14	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-16	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-16	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-17	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-19	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-21	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-21	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-26	1
Zanda sp.	white-tailed black cockatoo species	Summer	2024-12-31	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-02	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-05	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-05	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-05	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-05	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-09	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-11	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-11	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-12	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-12	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-12	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-12	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-12	1

Name	Vernacular	Season	Date	Abundance
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-12	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-12	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-12	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-13	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-13	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-14	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-14	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-14	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-16	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-17	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-17	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-18	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-19	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-22	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-23	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-24	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-27	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-01-29	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-02-01	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-02-01	1
Zanda sp.	white-tailed black cockatoo species	Summer	2025-02-01	1

Appendix 9 Black cockatoo potential nesting trees

The PNT dataset is too large to include here and is provided as separate digital dataset.

Appendix 10 Western Ringtail Possum habitat detailed quality scores per habitat

Fauna habitat	None	Low										Moderate							High						Total
	0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	Total	5	5.5	6	6.5	7	7.5	Total	8	8.5	9	9.5	10	Total	
Bluegum plantation			415.4								**415.4**							**0**						**0**	**415.4**
Cleared	2,666.00										**0**							**0**						**0**	**2666**
Cleared - degraded sumpland	8.1										**0**							**0**						**0**	**8.1**
Dam	1.7										**0**							**0**						**0**	**1.7**
Marri-Jarrah-Peppermint woodland	32.5	2.9	3.7	10.9	27.9	20.1		5.1	4.2	13.6	**88.4**	9.6	21.7	4.7	36.9	28.1	2	**103**	1.7	27.2	2.6	0.3	66.2	**98.00**	**321.9**
Open woodland of Peppermint trees (degraded)	50.7		6.3	26	3.5	8.8				3.5	**48.1**							**0**						**0**	**98.8**
Pine plantation	1.6										**0**							**0**						**0**	**1.6**
Seasonally inundated paperbark woodland (wetland)		113.8	10.5	8.5	5.2		7				**145**							**0**						**0**	**145**
Seasonally inundated sedgeland (wetland)		40.3		16.2	0.2		50.3				**107**							**0**						**0**	**107**
Seasonally inundated shrubland (wetland)	5.1	51.8	9.5	10.2	2.7		46.8				**121**							**0**						**0**	**126.1**
Total area (ha)	**2,765.7**	**208.8**	**445.4**	**71.8**	**39.5**	**28.9**	**104.1**	**5.1**	**4.2**	**17.1**	**924.9**	**9.6**	**21.7**	**4.7**	**36.9**	**28.1**	**2.0**	**103.0**	**1.7**	**27.2**	**2.6**	**0.3**	**66.2**	**98.0**	**3,891.6**
% of study area per score	**71.1%**	**5.4%**	**11.4%**	**1.8%**	**1.0%**	**0.7%**	**2.7%**	**0.1%**	**0.1%**	**0.4%**	**23.8%**	**0.2%**	**0.6%**	**0.1%**	**0.9%**	**0.7%**	**0.1%**	**2.6%**	**0.0%**	**0.7%**	**0.1%**	**0.0%**	**1.7%**	**2.5%**	**100.0%**