Wind Farm in Scott River

Ecological Gap Survey

Synergy Renewable Energy Developments Pty Ltd

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Document Tracking

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Abbreviations

Abbreviation	Description
BAM	*Biosecurity and Agriculture Management Act 2007*
BC Act	*Biodiversity Conservation Act 2016*
Bureau of Meteorology	BoM
CD	Conservation Dependent
DBH	Diameter at Breast Height
DPIRD	Department of Primary Industries and Regional Development
ELA	Eco Logical Australia
EN	Endangered
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESAs	Environmentally Sensitive Areas
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
kV	kilovolt
MW	Megawatts
NVIS	National Vegetation Information System
OS	Other specially protected species
P	Priority
PECs	Priority Ecological Communities
Phoenix	Phoenix Environmental Sciences
RiWi Act	*Rights in Water and Irrigation Act 1914*
SPRAT	Species Profile and Threats Database
SWIS	South West Interconnected System
SynergyRED	Synergy Renewable Energy Developments Pty Ltd
TECs	Threatened Ecological Communities
VU	Vulnerable
WAR01	Warren subregion
WAH	Western Australian Herbarium
WAM	Western Australian Museum
WoNS	Weeds of National Significance

Executive Summary

Eco Logical Australia (ELA) was engaged by Synergy Renewable Energy Developments Pty Ltd (SynergyRED) to undertake a Reconnaissance flora and vegetation assessment, Basic fauna survey, Targeted Black Cockatoo habitat assessment and Targeted Western Ringtail Possum survey and habitat assessment for a Proposed Wind Farm in Scott River (the Project). The survey area for the Project is 1.7 ha and is located in the Scott River Region, approximately 15 km northeast of the town of Augusta, in the South West of Western Australia. The survey was undertaken to fill a gap in survey effort conducted by Phoenix Environmental Sciences (Phoenix 2025a; 2025b) for the Project.

A desktop review of the Phoenix flora report (2025a) and Phoenix fauna report (2025b) was undertaken to assess the potential presence of conservation-significant flora, fauna, and ecological communities listed under the Commonwealth *Environment Protection and Biodiversity Act 1999* (EPBC Act) and the WA *Biodiversity Conservation Act 2016* (BC Act); and as Priority by the WA Department of Biodiversity, Conservation, and Attractions (DBCA). Prior to the field survey, 66 conservation-significant flora were identified from the desktop review of the reports (Phoenix 2025a; Phoenix 2025b), with all of these considered as having Potential to occur in the survey area. In addition, 25 conservation-significant fauna species were identified during the desktop assessment with all of these considered as having Potential to occur in the survey area. Furthermore, the pre-survey desktop assessment identified nine conservation-significant ecological communities, with one of these considered as having Potential to occur in the survey area.

The field survey was conducted by Glenn Harris-Maslen (Senior Ecologist) and Liv Sinclair (Environmental Consultant) on the 26th of June 2025. The survey was conducted in accordance with the Environmental Protection Authority (EPA) *Technical Guidance: Flora and Vegetation surveys for Environmental Impact Assessment* (EPA 2016). Vegetation types were described from three relevés and sought to expand upon mapping completed by Phoenix (2025a). Vegetation types were assigned based on the closest matching description of vegetation by Phoenix (2025a). The Basic fauna, black cockatoo and Western Ringtail Possum habitat assessment were conducted concurrently with the Reconnaissance flora and vegetation assessment. The Basic fauna survey was conducted in accordance with the EPA *Technical Guidance: Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020), and the Targeted black cockatoo habitat assessment was conducted in accordance with the *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo, and the Forest Red-tailed Black cockatoo* (DAWE 2022), with consideration for the *Survey guidelines for Australia's threatened birds* (DEWHA 2010). The Targeted Western Ringtail Possum survey was conducted in accordance with the methodology outlined within the *Survey guidelines for Australia's threatened mammals* (DSEWPaC 2011).

In total, 24 species from 15 families and 23 genera were recorded within the survey area. No species listed as Threatened under the EPBC Act or BC act, or as Priority by DBCA were recorded during the survey. A total of five introduced (weed) species were recorded in the survey area. None of these species were listed as a Declared Pest – s22(2) under the *Biosecurity and Agriculture Management Act 2007* (BAM Act) or Weeds of National Significance (WoNS). Following the field survey, a total of nine flora species were listed as having Potential to occur, comprising two Threatened flora (*Darwinia ferricola;* listed as Vulnerable [VU] under the EPBC Act and Endangered [EN] under the BC Act, and *Conospermum quadripetalum*; listed as Critically Endangered [CR] under the BC Act) and seven species listed as Priority by DBCA.

Two vegetation types were described and mapped within the survey area. The most widespread of these was the CcTpCeOh vegetation type comprising 12% of the survey area. Meanwhile, the XpAs vegetation type covered 12% of the survey area, whilst the remainder of the survey area was cleared of vegetation.

None of the vegetation types mapped within the survey area are considered to represent any Threatened Ecological Communities (TECs) listed under the EPBC Act or BC Act or Priority Ecological Communities (PECs) listed by DBCA.

The condition of intact native vegetation ranged from Excellent to Degraded, based on the vegetation condition scale of Keighery (1994) provided in EPA (2016) for the South-west Botanical Province. The CcTpCeOh vegetation type was in Very Good to Excellent condition, whilst the XpAs vegetation type was in Degraded condition. Cleared areas accounted for 1.3 ha (76%) of the survey area.

In total, ten vertebrate fauna species (including one introduced species) were recorded within the survey area, comprising nine birds and one mammal. No direct (observations) or indirect (scats, tracks, diggings) evidence of Threatened fauna species listed under the EPBC Act or the BC Act, or Priority fauna species as listed by DBCA were recorded within the survey area. Following the field survey, three species were considered Likely to occur within the survey area, including three Threatened fauna, comprising Baudin's Cockatoo (*Zanda baudinii*; listed as EN under the EPBC Act and BC Act), Carnaby's Cockatoo, (*Zanda latirostris*, listed as EN under the EPBC Act and BC Act) and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*; listed as VU under the EPBC Act and BC Act). A further seven fauna species were considered with the Potential to occur, comprising two Threatened fauna (Western Ringtail Possum [*Pseudocheirus occidentalis]*; listed as CR under the EPBC Act and BC Act, and Chuditch [*Dasyurus geoffroii*] listed as VU under the EPBC Act and BC Act) and five species listed as Priority by DBCA.

One introduced fauna species was recorded in the survey area, namely Laughing Kookaburra (*Dacelo novaeguineae*). This species is listed as Permitted (s11) under the State BAM Act (DPIRD 2025).

A total of two fauna habitats were recorded within the survey area, namely Marri-Jarrah-Peppermint woodland and Cleared – Degraded Sumpland. The most widespread of these was the Marri-Jarrah-Peppermint woodland fauna habitat, comprising 12% of the survey area (0.2 ha). Meanwhile, the Cleared – Degraded Sumpland fauna habitat covered 12% of the survey area (0.2 ha), whilst the remainder of the survey area was mapped as Cleared (1.3 ha).

No primary or secondary evidence (i.e. foraging evidence) of Black Cockatoos was recorded in the survey area. An assessment of the fauna habitat types against the DAWE (2022) scoring tool found the Marri-Jarrah Peppermint woodland to represent High quality foraging habitat for Baudin's Cockatoo and Forest Red-tailed Black Cockatoo and Moderate quality habitat for Carnaby's Cockatoo. The Cleared-Degraded Sumpland fauna habitat was considered High quality for Baudin's Cockatoo and Moderate quality for Carnaby's Cockatoo, given the presence of foraging species *Xanthorrhoea preissii*; this habitat provides no value to Forest Red-tailed Black Cockatoo and was assigned a score of 0. Based on Bamford methodology (2021), most of the survey area was mapped as High quality foraging habitat for all three Black Cockatoo species due to the presence of foraging species within the Marri-Jarrah-Peppermint woodland habitat type. The Cleared-Degraded Sumpland fauna habitat was considered to have Moderate foraging value for Baudin's Cockatoo and Carnaby's Cockatoo, given the high density of foraging species *Xanthorrhoea preissii*. However, no suitable foraging species for Forest Red-tailed Black Cockatoo were present within the Cleared-Degraded Sumpland fauna habitat.

The survey area contains ten potentially suitable breeding trees (>500 mm DBH). Five of these trees contained hollows, although all of these were considered unsuitable for breeding due to their insufficient size (< 10 cm) or orientation.

Given the presence of tall trees and the proximity to water sources nearby, the Marri-Jarrah Peppermint woodland fauna habitat was considered to represent potential night-roosting habitat in the survey area for Black Cockatoos.

No primary or secondary evidence (i.e dreys) of Western Ringtail Possums were made during the Targeted Western Ringtail Possum survey. A total of 0.2 ha (12% of the survey area) of Moderate quality habitat was recorded and comprised solely of the Marri-Jarrah Peppermint woodland fauna habitat type. The remainder of the survey area provides no habitat value to Western Ringtail Possum due to a lack of continuous canopy.

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1. Introduction

1.1. Project Background

Eco Logical Australia (ELA) was engaged by Synergy Renewable Energy Developments Pty Ltd (SynergyRED) to undertake a Reconnaissance flora and vegetation assessment, Basic fauna survey, Targeted Black Cockatoo habitat assessment and Targeted Western Ringtail Possum survey (the survey) for the Proposed Wind Farm in Scott River (the Project).

The Project proposes the development of an onshore wind farm in the Scott River region, approximately 15 km northeast of the town of Augusta, in the South West of Western Australia. The Project will involve the construction and operation of up to 20 wind turbines, generating up to 100 megawatts (MW), with associated infrastructure including monitoring and communication towers, operation and maintenance building, substation and transmission infrastructure and other supporting infrastructure. The substation will connect the Proposal to the South West Interconnected System (SWIS) via the existing 132 kilovolt (kV) Beenup to Manjimup transmission line. The Project is proposed to be developed within a 3,597 ha Development Envelope.

In support of connecting the Project to the SWIS, Western Power recently identified a need to run a new transmission line from an existing transmission pole to the existing Beenup substation which may require native vegetation clearing within this area (herein, referred to as the 'survey area'). Therefore, ecological surveys are required within this extent to support environmental and planning approvals. The survey area includes a 1.7 ha extent between the substation and existing transmission pole (Figure 1). This area was not included in previous ecological surveys conducted by Phoenix Environmental Sciences (Phoenix 2025a; 2025b). This survey serves to fill this gap in survey effort to ensure that the entire Development Envelope has been surveyed for flora and fauna values to an adequate extent, in accordance with relevant guidelines.

This technical report summarises the results of this survey and defines the flora, vegetation, Black Cockatoo and Western Ringtail Possum habitat, as well as the conservation significance of these values within the survey area. The habitat and vegetation assessments conducted have sought to align outcomes with those adjacent to the survey area by Phoenix (2025a; 2025b).

1.2. Scope of Works

The purpose of the survey was to provide an assessment of the environmental values of the survey area to support the environmental assessment, approvals and planning process. The scope of works specifically includes:

- Undertaking an initial desktop assessment to determine environmental values and conservation significant flora, fauna, habitat, vegetation or other environmental features (such as riparian areas or wetlands) relating to the survey area
- Undertaking a field survey of the survey area, including the following tasks:
    - A Reconnaissance flora and vegetation assessment
    - A Basic fauna survey
    - A Targeted Black Cockatoo habitat assessment
    - A Targeted Western Ringtail Possum survey and habitat assessment

- Preparing a technical report for the Project that describes the flora, vegetation, and fauna values within the survey area
- Providing all spatial mapping/data collected during the survey separately for the Project.

Figure 1: Survey area location

Survey area

Local distributor road

N

0 100 200 400

Metres

Datum/Projection:
GDA 1994 MGA Zone 50

24PER7886-KR Date: 8/08/2025

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2. Environmental Setting

2.1. Bioregion

The Interim Biogeographic Regionalisation for Australia (IBRA) currently classifies 89 bioregions across Australia, based on a range of biotic and abiotic factors such as climate, vegetation, fauna, geology and landform (Thackway and Cresswell 1995; DAWE 2012). These bioregions are further divided into 419 sub-regions representing more localised and homogenous geomorphological units in each bioregion. IBRA divides Western Australia into 26 biogeographic regions and 53 subregions based on dominant landscape characteristics of climate, lithology, geology, landform, and vegetation.

The survey area is located within the Warren bioregion and subregion of the same name (WAR01). The Warren bioregion is made up of 'Dissected undulating country of the Leeuwin Complex and Albany Orogen with loamy soils supporting Karri Forest, laterites supporting Jarrah-Marri forest, leached sandy soils in depressions and plains supporting paperbark/sedge swamps, and Holocene marine dunes with *Agonis flexuosa* woodlands.'

2.2. Climate

The Warren bioregion is described as a moderate mediterranean climate. Climate data was taken from the Bureau of Meteorology (BoM) Cape Leeuwin weather station (station number 9518, rainfall and temperature data 1897 – 2025), located 21 km south of the survey area (BoM 2025). Based on this data, the survey area receives an annual average rainfall of 948.6 mm, with most of the rainfall occurring during the winter months of June, July, and August (BoM 2025; Figure 2). Mean maximum air temperatures range from 23.4°C in February to 16.5°C in July and August and mean minimum air temperatures range from 18.6°C in February to 11.3°C in July.

In the 12 months preceding the field survey (June 2024 to May 2025), Cape Leeuwin weather station received a total of 781.0 mm of rainfall, which is below the long-term average for the area (948.6 mm). A total of 110.6 mm was recorded in the three months prior to the field survey (February, March and April 2025), which is also below the long-term average for the same period (221.5 mm; Figure 2).

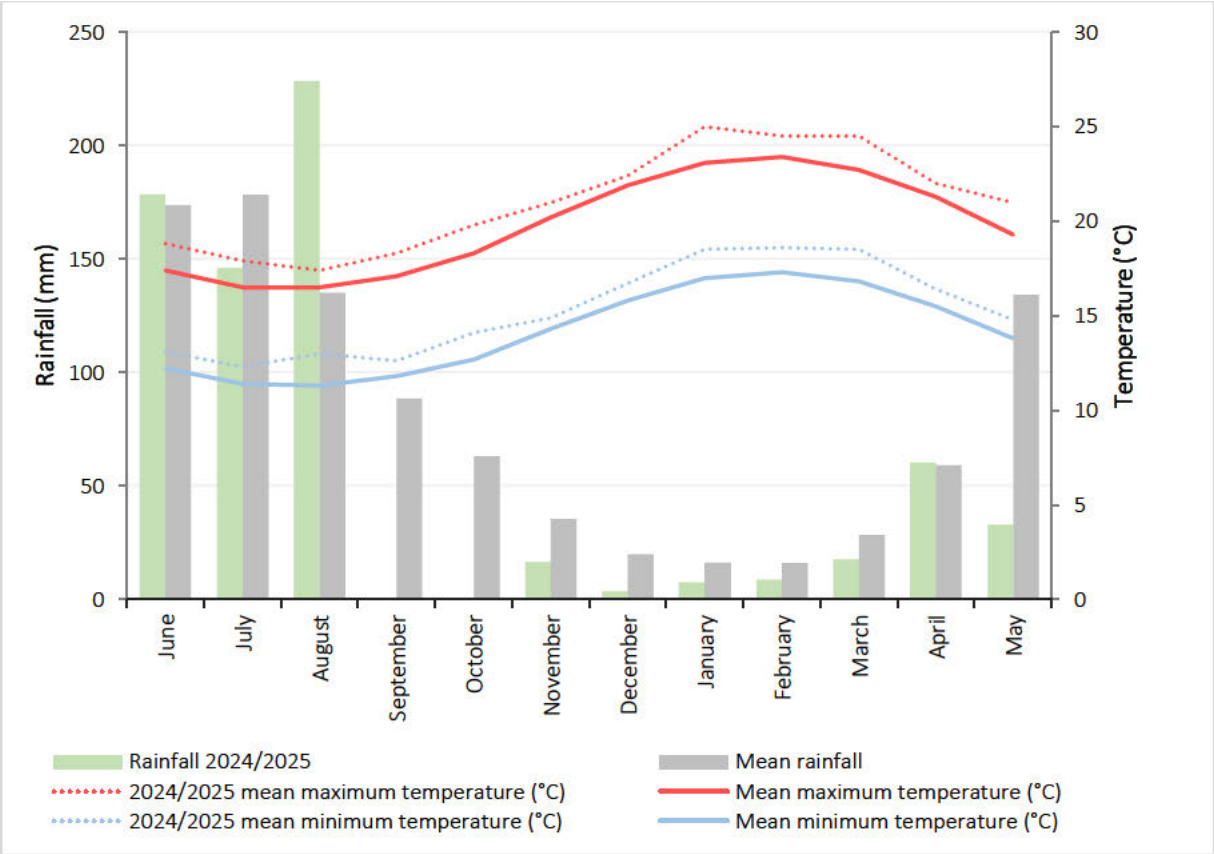

Figure 2: Climate data for the survey area

*Short term (2024-2025) and long term (1897-2025) average rainfall and temperature data from Cape Leeuwin Weather Station (station #9518). Rainfall and temperature data 2024/2025 are from June 2024 to May 2025.

2.3. Geology, Landform and Soils

Soil-landscape mapping prepared by the Department of Primary Industries and Regional Development (DPIRD) provides an inventory and condition survey of lands at a 1:250,000 scale (DPIRD 2022). The survey area is located entirely within the Scott River Plain System (Figure 3). The Scott River Plain System is described as a "poorly drained coastal plain, in the southern Donnybrook Sunkland. Non-saline wet soil and pale deep sand. Heaths, sedgelands and Jarrah-Marri-paperbark woodland."

According to the Surface Geology of Australia 1:1,000,000 scale, WA database (Stewart *et al.* 2008), the survey area intersects one geological formation, namely Estuarine, lagoonal and lacustrine deposits 74394 (Cze). This surface geology type is described as "Estuarine, lagoonal and lacustrine deposits. Numerous small lakes and swamps. Linear dunes common".

Figure 3: Land systems of the survey area

0 25 50 100
Metres

Datum/Projection:
GDA 1994 MGA Zone 50

24PER7886-KR Date: 18/07/2025

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2.4. Regional Vegetation

Vegetation type and extent have been mapped at a regional scale by Beard (1979) who categorised vegetation into broad vegetation associations. Based on this mapping at a scale of 1:250,000, DPIRD has compiled a list of vegetation extent ant types across Western Australia (DPIRD 2019; Shepherd *et al.* 2002). Two system-vegetation associations occur within the survey area, namely Scott River 3 and Scott River 27 (DPIRD 2019; Table 1; Figure 4). These vegetation associations have approximately 78% and 74% of their total Pre-European extents remaining within the Warren bioregion, respectively.

Table 1: Beard's (1979) vegetation associations of the survey area

Vegetation association	Vegetation description	Pre-European extent in Warren Bioregion (ha)	Current extent in Warren Bioregion (ha)	% Remaining in Warren Bioregion
3	Mainly jarrah and marri *Eucalyptus marginata, Corymbia calophylla*	250,262.10	195,318.18	78.05
27	Other acacia, banksia, peppermint, cypress pine, casuarina, York gum Acacia spp., *Banksia* spp., *Agonis flexuosa*, *Callitris* spp., *Allocasuarina spp.*, *Eucalyptus loxophleba*.	70,203.73	52,262.13	74.44

Source: DBCA Statewide Vegetation Statistics (DBCA 2019)

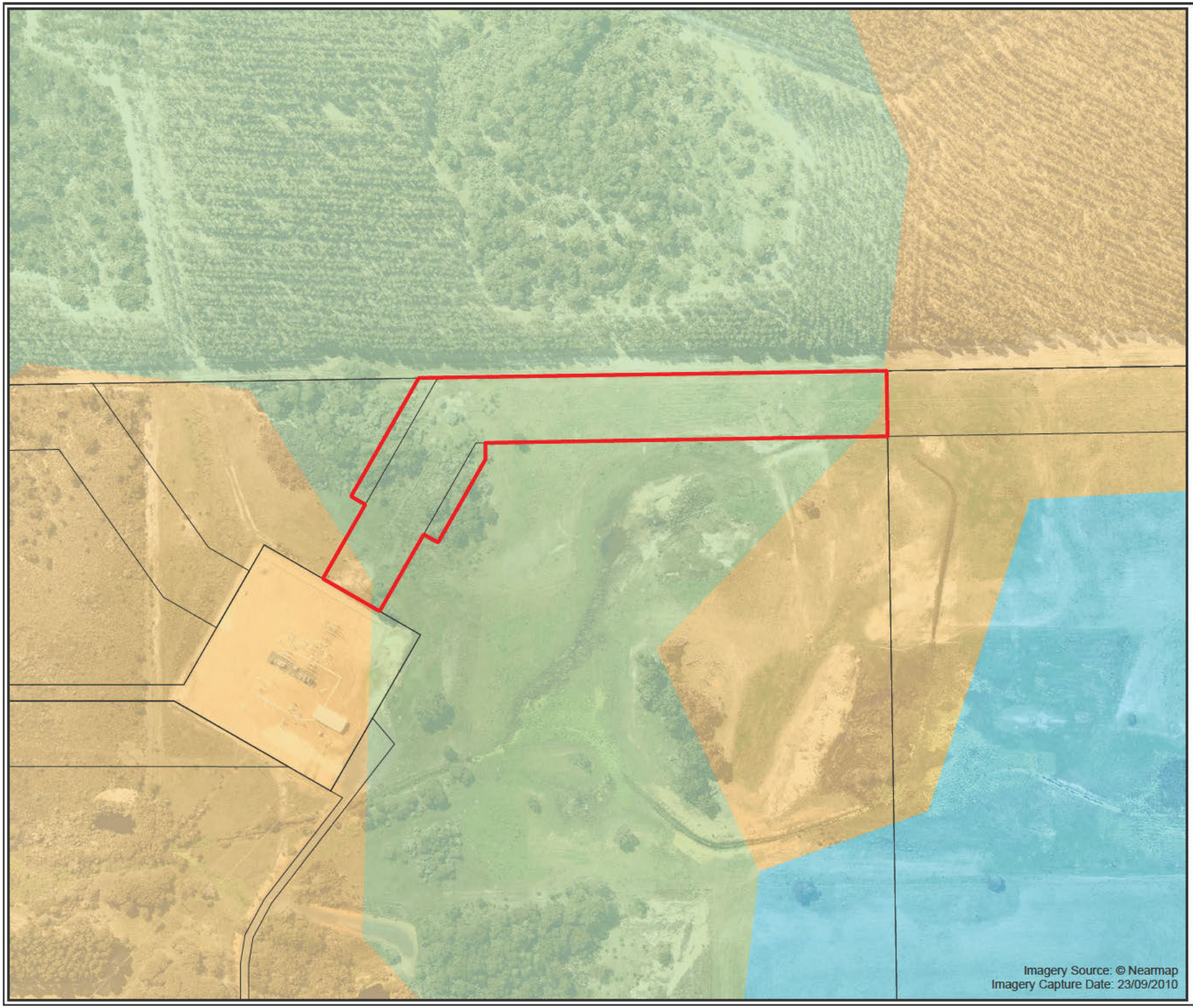

Figure 4: Beard vegetation associations of the survey area

0 25 50 100
Metres

Datum/Projection:
GDA 1994 MGA Zone 50

24PER7886-KR Date: 18/07/2025

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2.5. Hydrology

The survey area is located within the Lower Blackwood subcatchment and Blackwood River catchment. The Blackwood River catchment spans 22,594 km^2, extending 300 km inland from the river mouth of the Blackwood River at the Hardy Inlet, located approximately 10 km south of the survey area (DWER 2018). Key surface water features in the region consist of historically modified catchments, where artificial drains have been constructed to facilitate agricultural and plantation activities (Stantec 2025).

The Scott River and Blackwood River are the main surface water drainages in the region. The Scott River acts as a tributary to the Blackwood River and the confluence of the rivers is located approximately 10.5 km southwest. A minor perennial watercourse that drains to the Blackwood River occurs approximately 200 m south of the survey area.

Wetlands have been mapped by the Department of Biodiversity, Conservation and Attractions (DBCA) across the south west to be used for the purposes of land-use, planning, and management (DBCA 2017). This dataset, namely the Geomorphic Wetlands, Augusta to Walpole, does not have assigned management categories; however, it does categorise wetlands into types based on physical characteristics. The survey area intersects one wetland mapped under the Geomorphic Wetlands, Augusta to Walpole dataset (DBCA 2017). This wetland is classified as Palusplain (seasonally waterlogged flat).

The survey area occurs within the Blackwood Groundwater Area, which is proclaimed under the *Rights in Water and Irrigation Act 1914* (RiWi Act) and does not occur in close proximity to any drinking water source protection areas (DWER 2024; DWER 2025).

2.6. Areas of Conservation Significance

Environmentally Sensitive Areas (ESAs) are defined in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005* under s51b of the *Environmental Protection Act 1986* (EP Act). ESAs include areas declared as World Heritage areas, areas included on the Register of the National Estate, defined wetlands, Bush Forever sites, vegetation containing rare (Threatened) flora and/or Threatened Ecological Communities (TECs).

The survey area overlaps one ESA (Figure 6). This is likely to be associated with buffers of TECs and geomorphic wetlands. Therefore, the extent of the actual ESA may not actually intersect the survey area. The DBCA Threatened and Priority Communities database search conducted by Phoenix (2025a) identified a series of occurrences of Scott River Ironstone Association TEC that were buffered by 500 – 2000 m.

The survey area does not intersect any conservation reserves. However, several conservation reserves, national parks and state forest (Figure 6) occur in proximity to the survey area, including:

- Scott National Park (4.4 km)
- Chapman Brook National Park (11.2 km)
- South Blackwood State Forest (4.0 km)
- Pagett Nature Reserve (4.4 km)
- Chester Nature Reserve (7.3 km)
- Unnamed Nature Reserve (WA42377) (5.0 km).

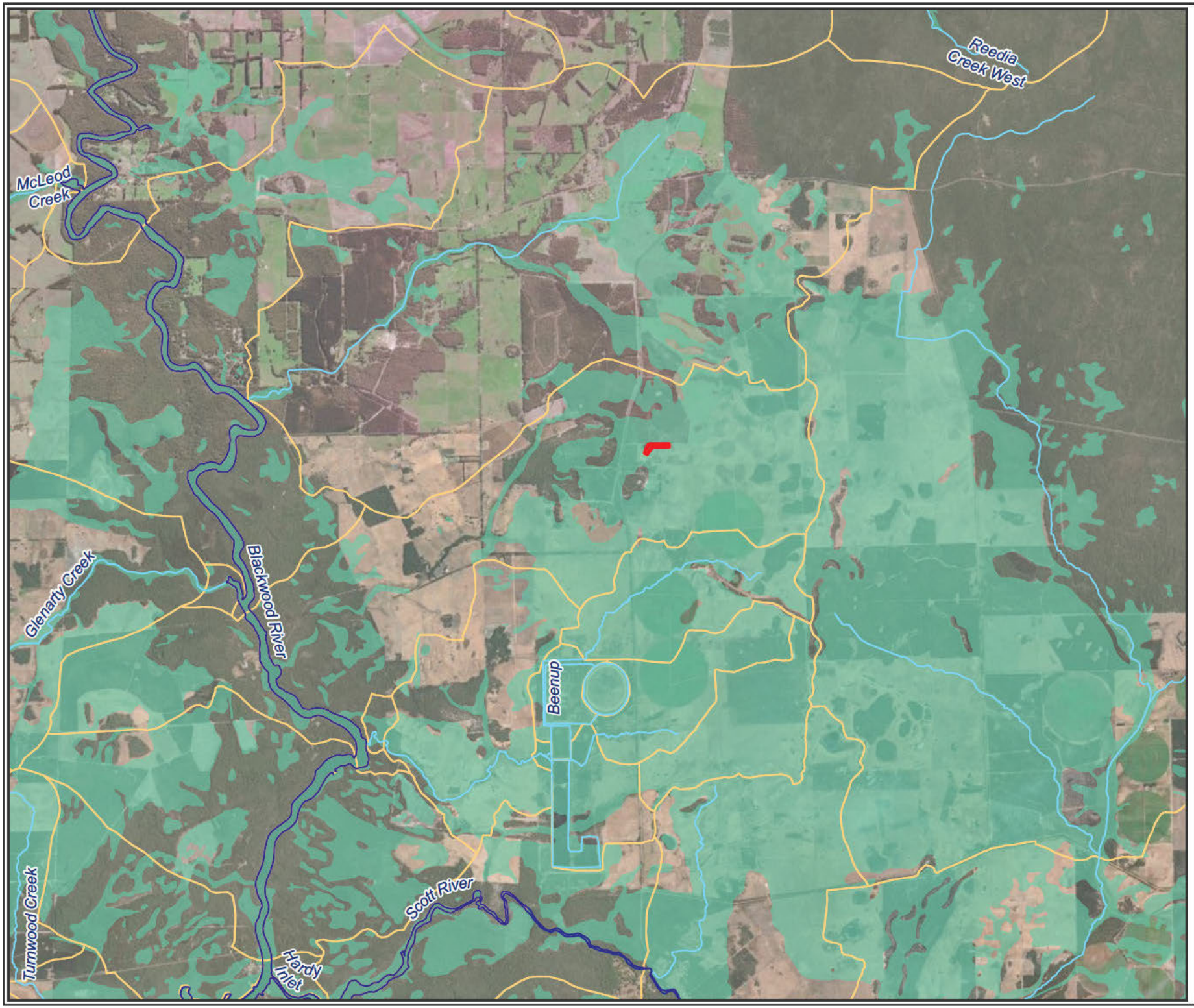

Figure 5: Hydrology of the survey area

0 0.5 1 2
Kilometres

Datum/Projection:
GDA 1994 MGA Zone 50

24PER7886-KR Date: 18/07/2025

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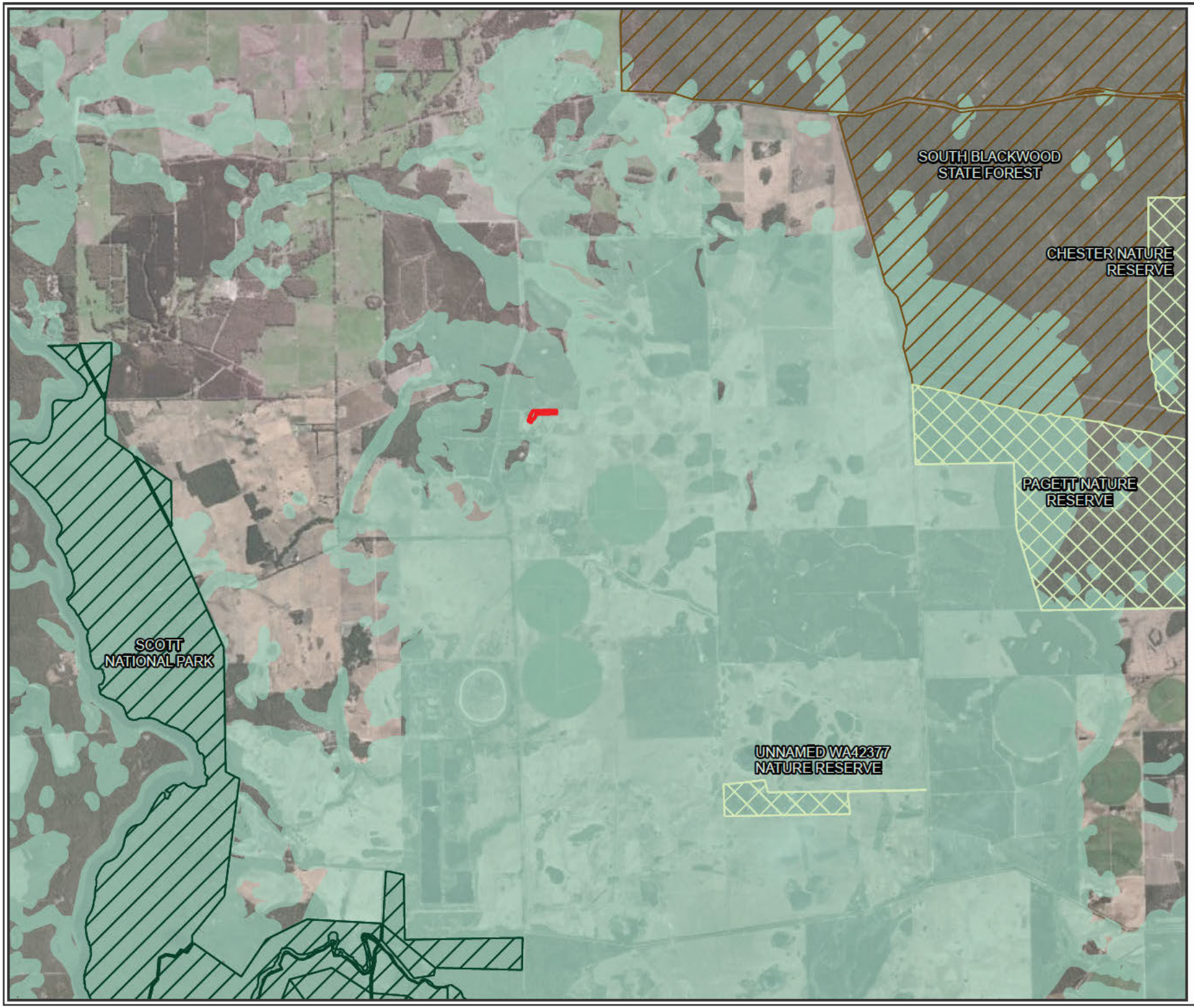

Figure 6: Areas of conservation significance within and in proximity to the survey area

3. Methodology

3.1. Desktop Review

An initial desktop assessment was undertaken by ELA personnel prior to the field survey to determine environmental values and conservation significant flora, fauna, habitat, vegetation, and other environmental features (such as Black Cockatoo and Western Ringtail Possum habitat) relating to the survey area.

The Phoenix flora report (2025a) and Phoenix fauna report (2025b), as well as aerial imagery were reviewed to obtain information relating to conservation significant flora, fauna and ecological communities to inform the field survey. Phoenix (2025a; 2025b) undertook searches of several biological databases and literature to identify and prepare lists of significant flora and vegetation that may occur within the area. Databases interrogated included the Protected Matters Search Tool (DCCEEW 2023), DBCA Threatened and Priority Flora Database (DBCA 2023a), DBCA Threatened and Priority Fauna Database (DBCA 2023b), DBCA Threatened and Ecological Communities Database (DBCA 2023c). Applied search buffers were considered suitable based on flora and fauna assemblages expected to occur within the survey area.

3.1.1. Likelihood of Occurrence Assessment

An assessment of the likelihood of potential conservation significance species (including Threatened and Priority flora and fauna species) and communities being present within the survey area (where relevant) was undertaken. The assessment is based on specific likelihood of occurrence criteria. The criteria include factors such as location of previous records in relation to the survey area, vegetation community, structure and condition, landforms, soils, signs of species presence and the extent and connectivity of bushland for fauna and habitat that appears to be present based on the desktop review and aerial imagery.

Conservation codes, categories, and criteria for flora and fauna protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the State *Biodiversity Conservation Act 2016* (BC Act) are provided in Appendix A (DBCA 2023d, DBCA 2023e). Criteria used for this assessment are presented in Appendix B.

3.2. Field Survey

3.2.1. Survey Team and Timing

The field survey was conducted by Glenn Harris-Maslen (Senior Ecologist) and Liv Sinclair (Environmental Consultant) on the 26th of June 2025. Lead field staff had valid scientific licenses to conduct flora and vegetation surveys and to take Threatened and Priority flora in Western Australia at the time of the survey (Table 2). The survey timing was out of season for undertaking Detailed and Targeted flora and vegetation surveys in the Southern climatic region, therefore only a Reconnaissance survey was conducted. No licenses were required for the Basic fauna survey, Targeted Black Cockatoo habitat survey or Targeted Western Ringtail Possum survey. Survey timing was consistent with the DCCEEW recommendations for undertaking surveys for Black Cockatoos on the Swan Coastal Plain (i.e., foraging habitat and night roosts – any time of the year; DAWE 2022).

Table 2: Survey team

Staff	Role	Flora license/s
Glenn Harris-Maslen	Senior Ecologist, Field lead, Field survey	Flora taking license: FB62000376-2 Threatened Flora License: 2324-0100
Liv Sinclair	Environmental Consultant, Field survey	N/A

3.2.2. Reconnaissance Survey

The Reconnaissance flora and vegetation survey was conducted in accordance with the Environmental Protection Authority (EPA) *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016). A total of three relevés were established within the survey area to describe and map vegetation types, including a vegetation condition assessment. The location of the relevés is shown in Figure 7.

At each relevé, the following information was recorded:

- A colour photograph of representative vegetation
- Location of vegetation type
- Description of vegetation associations in accordance with Level V of the National Vegetation Information System (NVIS) and Aplin's (1979) modification of vegetation classification adapted from Specht (1970). For each stratum, this included:
  - Dominant growth form
  - Height
  - Cover
  - Three dominant genera
- Description of vegetation condition classification according to Keighery (1994; EPA 2016)
- Average % cover of leaf litter and bare ground
- Disturbance details including:
  - Fire history (time since last fire)
  - Physical disturbance including evidence of erosion
  - Evidence of grazing
  - Weed invasion.

Mapping of vegetation sought to expand upon mapping completed by Phoenix (2025a) within the survey area by comparing flora species assemblages recorded within the survey area and characterising vegetation types based on existing mapped vegetation communities. Vegetation types were assigned based on the closest matching description of vegetation by Phoenix (2025a).

Flora specimen identification following the field survey was undertaken by taxonomic specialists at the Western Australian Herbarium (WAH). Suitable material that meets WAH specimen lodgement requirements, such as flowering material and range extensions, was submitted along with Threatened and Priority Report forms to DBCA, as required by conditions of collection licences issued under the BC Act.

Nomenclature used for the flora species within this report follows the WA Plant Census as available on FloraBase (WAH 1998-).

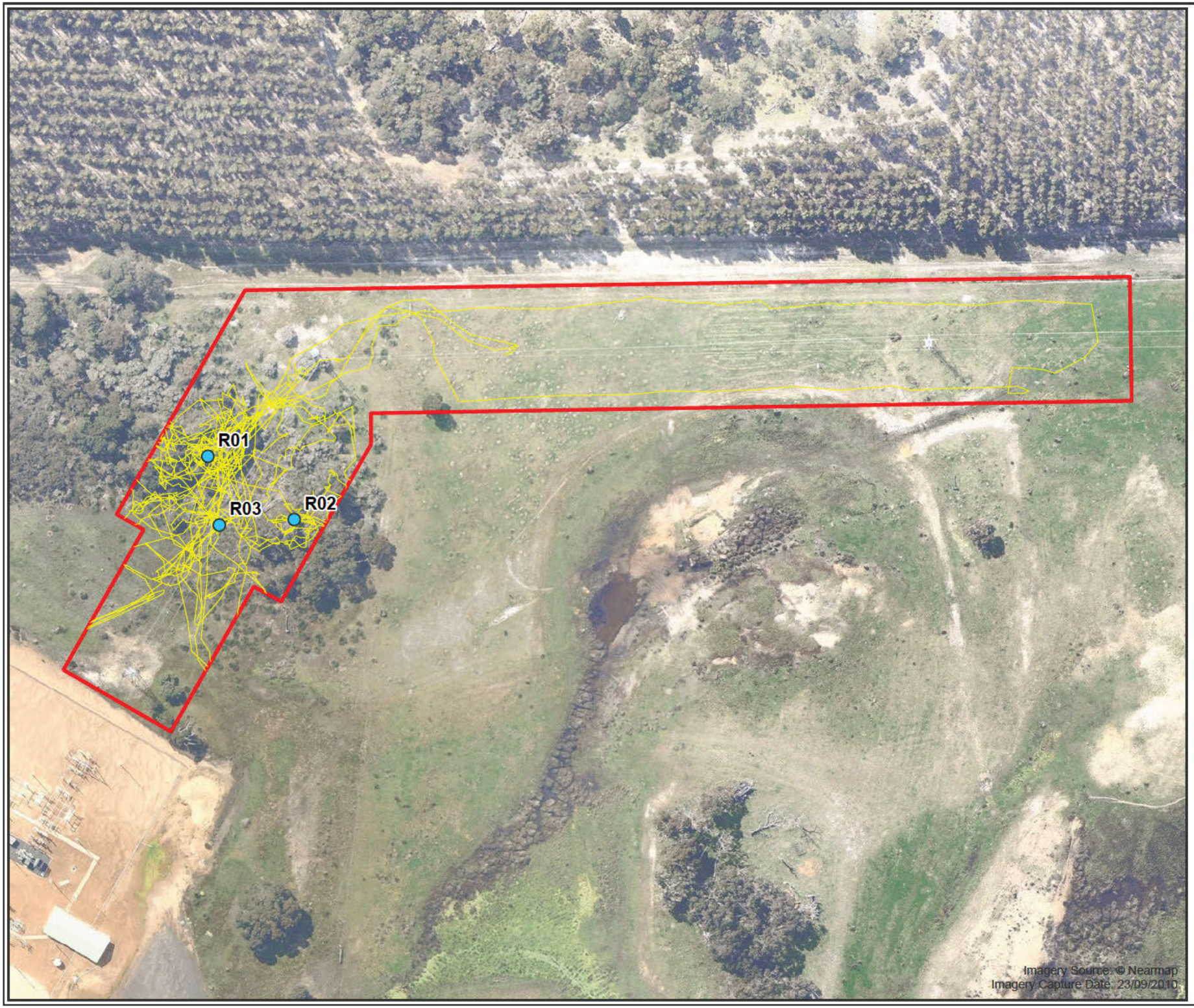

Figure 7: Survey effort

0 12.5 25 50
Metres

Datum/Projection:
GDA 1994 MGA Zone 50

24PER7886-KR Date: 8/08/2025

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3.2.3. Basic Fauna Survey

The Basic fauna survey was conducted in accordance with the EPA *Technical Guidance: Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020). The survey involved personnel walking traverses through the survey area, describing and mapping fauna habitats and recording opportunistic sightings of fauna. Fauna habitats were assessed for their ability to support and sustain populations of fauna, along with an assessment of the likelihood of occurrence of conservation significant fauna species.

Opportunistic recordings of fauna species were made at all times during the field survey. These included visual sightings of active fauna such as reptiles and birds; records of bird calls; and signs of species presence such as tracks, diggings, burrows, scats, and any other signs of fauna activity. Nomenclature used for the vertebrate fauna species within this report follows the Western Australian Museum (WAM) Checklist of the Vertebrates of Western Australia (WAM 2024).

3.2.4. Targeted Black Cockatoo Habitat Assessment

A Targeted black cockatoo habitat assessment was conducted in accordance with the *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo, and the Forest Red-tailed Black cockatoo* (DAWE 2022). Consideration was also given to the *Survey guidelines for Australia's threatened birds* (DEWHA 2010) when designing the survey methodology.

Three species of black cockatoo occur in the south-west of Western Australia:

- Baudin's Cockatoo (*Zanda baudinii*; listed as Endangered [EN] under the EPBC Act and BC Act)
- Carnaby's Cockatoo (*Zanda latirostris*; listed as Endangered [EN] under the EPBC Act and BC Act)
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*; listed as Vulnerable [VU] under the EPBC Act and BC Act).

Broad scale maps are available for the modelled distribution of all three species of black cockatoo (DAWE 2022). The survey area occurs within the Likely to occur range of the Forest Red-tailed Black Cockatoo and Carnaby's Cockatoo, as well as the predicted breeding range of Baudin's Cockatoo. The survey therefore focused on assessing the habitat values for all three species. Any individuals of Carnaby's Cockatoo, Baudin's Cockatoo, and/or Forest Red-tailed Black Cockatoo observed in the survey area were recorded, including the number of individuals.

The Targeted survey involved personnel walking transects across the survey area and mapping black cockatoo habitat. Black cockatoo habitat is conventionally separated into foraging, potential breeding, and potential night roosting categories, as defined in Appendix C. Foraging, potential breeding and potential roosting habitat was assessed within the survey area. The field methodology for each of these is defined below.

3.2.4.1. Foraging Habitat

Foraging habitat is defined for each species of black cockatoo in Appendix C. The foraging value (i.e. quality) of vegetation to black cockatoos depends upon several factors including the foraging plant species present, the extent and density (including projected foliage cover) of those foraging species, and the overall structure and condition of foraging species present. In addition, connectivity, proximity to known breeding and roosting sites, and the presence of weeds and/or tree deaths (i.e. disease or drought) is also to be considered.

In accordance with Phoenix (2025b), the assessment of foraging habitat quality for each black cockatoo species was undertaken based on two scoring methods; The DAWE (2022) foraging quality scoring tool

and Bamford (2021) scoring tool. The DAWE (2022) scoring tool starts at a score of 10 and subtracts points for the following attributes: foraging potential, connectivity, proximity to breeding and/or roosting, and impact from plant disease. Meanwhile, the Bamford (2021) method provides a more detailed and accurate analysis of foraging quality by calculating quality based on the following functional aspects:

- Site condition
- Site context
- Species stocking rate.

Fauna habitat described and mapped within the survey area was assigned a foraging quality (i.e. None, Low, Moderate, or High) in accordance with the Bamford (2021) method criteria outlined in Appendix D. The DAWE (2022) foraging quality scoring template is provided in Appendix E.

Evidence of black cockatoo foraging (i.e. branch clippings and/or chewed fruit) was also searched for to identify if the vegetation within the survey area has previously been or is currently being used by black cockatoos for feeding.

3.2.4.2. Potential Breeding Habitat

Potential breeding habitat is defined in Appendix C. Potential breeding trees 'diameter at breast height' (DBH) were recorded in the following ranges:

- Small; approximately 500-600 mm
- Medium; between 600 and 1000 mm
- Large; over 1000 mm.

All potential breeding trees encountered within the black cockatoo survey area were recorded with a Global Positioning System (GPS). Each potential breeding tree was also visually assessed from the ground for the presence of suitable nest hollows (defined in Appendix C) and allocated a breeding and/or hollow rank (Table 3).

Table 3: Potential breeding tree and/or hollow ranking

Rank	Description of potential breeding tree and/or hollows
1	Active nest observed (adult bird seen entering or emerging from hollow, their eggs, fledglings or other evidence of recent breeding activity present); known active nest (as described by Birdlife 2022).
2	Hollow of suitable size and angle (i.e., near-vertical) observed with chew marks around entrance.
3	Potentially suitable hollow observed but no chew marks present.
4	Tree lacking suitable hollows or broken branches that might have large hollows, a tree with mainly intact branches and a spreading crown.

[1]ELA takes a precautionary approach and identifies potentially suitable hollows as those with an entrance diameter over 10 cm that could potentially accommodate Forest Red-tailed Black Cockatoo, which requires a diameter opening range of 12 – 41 cm.

3.2.4.3. Potential roosting habitat

Potential night roosting habitat is defined in Appendix C. Potential night roosting habitat was described by mapping tall trees in proximity to water (i.e., within 12 km). A 5 m buffer was applied around each of these trees to depict projected foliage cover to estimate potential roosting habitat as hectares.

3.2.5. Targeted Western Ringtail Possum Survey and Assessment

The Western Ringtail Possum (*Pseudocheirus occidentalis*) is listed as Critically Endangered (CR) under the EPBC Act and BC Act. Broad scale mapping of the modelled distribution of Western Ringtail Possum is available on the Commonwealth Species Profile and Threats Database (SPRAT) and in the Recovery Plan for the species (DCCEEW 2025; DPaW 2017). The Recovery Plan for the Western Ringtail Possum lists three key management zones known to support large numbers of Western Ringtail Possums, with these zones considered the most important extant populations at present. The survey area is located directly adjacent to the Swan Coastal Plain management zone. Therefore, given the close proximity and in accordance with the Recovery Plan, it is assumed that the characteristics of this management zone are applicable to the survey area. The Swan Coastal Plain zone consists of peppermint woodlands and peppermint/tuart forests on the southern extremity of the Swan Coastal Plain, extending from north of Bunbury to Augusta, but principally around Busselton.

Given Phoenix (2025b) identified a substantial amount of Western Ringtail Possum habitat in proximity to the survey area, it assumed to be Likely to contain Western Ringtail Possums prior to the assessment. A Targeted Western Ringtail Possum survey was conducted across one night on 26 June 2024. Nocturnal searching (spotlighting) was conducted throughout the survey area to identify Western Ringtail Possum individuals. The Targeted survey was conducted in accordance with the methodology outlined within the *Survey guidelines for Australia's threatened mammals* (DSEWPaC 2011).

In accordance with Phoenix (2025b), the Western Ringtail Possum habitat assessment was undertaken in using the DCCEEW scoring tool (2024), which is provided in Appendix F. The scoring tool considers the following three elements:

- Habitat quality: 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: connectivity of habitat in the study area and surrounding landscape, management tenure of site
- Species stocking rate: records of species on site.

The scores were categorised into High (8 or above), Moderate (5 – 7.5) and Low (0.5 – 4.5) quality ratings to indicate where the higher value habitat was present in the survey area.

3.2.6. Limitations

The EPA Technical Guidance documents (EPA 2016, 2020) recommend including a discussion of the constraints and limitations of the survey methods used. An assessment of potential limitations of this survey are summarised in Table 5 below. One potential survey constraint was identified.

Table 4: Survey limitations

Constraint	Limitations
Sources of information and availability of contextual information (i.e. pre-existing background versus new material).	**Not a constraint.** Broad-scale vegetation mapping (Beard 1979) at a scale of 1:1,000,000 was available. Land system mapping at a scale of 1:2,000,000 and soil and landform mapping was also available. Available information was sufficient to provide context at varying scales and therefore were not considered a limitation.
Scope (i.e. what life forms, etc., were sampled).	**Not a constraint.** As per the requirements of the scope, a Reconnaissance flora and vegetation survey Targeted Black Cockatoo habitat assessment, Targeted Western Ringtail Possum habitat assessment and a Basic fauna survey were conducted in accordance with

Constraint	Limitations
	relevant State and Federal legislation and EPA guidance documents and was adequately met.
Proportion of flora collected and identified (based on sampling, timing and intensity).	**Not a constraint**. Proportion of flora species collected was adequate to meet the requirements of the level of survey undertaken (Reconnaissance level). Foot traverses were undertaken across the survey area to compile a species list in order to meet the objectives of the survey.
Completeness and further work which might be needed (i.e. was the relevant survey area fully surveyed).	**Not a constraint**. The survey area was fully covered to meet requirements outlined in the scope of works. Relevé locations were selected using high resolution aerial photography, and ground-truthed in the field, to ensure all apparent vegetation types identified were sampled. Site selection was considered adequate to accurately analyse and discriminate sites based on species composition and subsequently delineate vegetation type boundaries.
Mapping reliability.	**Not a constraint**. Delineation and mapping of vegetation types was adequate based on requirements of a Reconnaissance level survey.
Timing, weather, season, cycle.	**Potential constraint**. The survey area is located within the Southwest botanical province of Western Australia. Recommended survey timing for this region is during spring (September – November). The flora and vegetation survey was undertaken out of season (June). Detectability of species for the requirement of a Reconnaissance flora and vegetation survey and a Basic fauna survey was not considered to be a constraint; a post survey flora and fauna likelihood assessment was undertaken in view of survey timing. Rainy conditions encountered during the targeted Western Ringtail Possum survey may have impacted the ability to detect Western Ringtail Possum individuals, representing a potential constraint.
Disturbances (fire, flood, accidental human intervention, etc.).	**Not a constraint**. Disturbances recorded within the survey area included the presence of weeds, clearing and grazing.
Intensity (in retrospect, was the intensity adequate).	**Not a constraint**. The survey effort was adequately met. The number of relevés established was sufficient to determine the vegetation types present and to identify any vegetation of conservation significance.
Resources (i.e. were there adequate resources to complete the survey to the required standard).	**Not a constraint**. The number of personnel conducting this field survey in the given time was adequate to undertake the required level of survey. Additional resources, including equipment available, additional support and personnel were adequate.
Access problems (i.e. ability to access survey area).	**Not a constraint**. All relevant areas within the survey area were able to be accessed and surveyed.
Experience levels (e.g. degree of expertise in plant identification to taxon level).	**Not a constraint**. The personnel conducting this field survey were both suitably qualified to undertake the ecological surveys.

4. Results

4.1. Desktop Assessment

4.1.1. Conservation Significant Flora Species

Conservation significant flora species previously recorded within and in proximity to the survey area by Phoenix (2025a) are presented in Figure 8. The pre-survey flora likelihood of occurrence assessment is provided in Appendix G. No previous records of conservation significant flora were identified within the survey area. Prior to the field survey, all 66 conservation significant flora species identified from the desktop review of the Phoenix (2025a) report were considered as having Potential to occur, due to the proximity of the nearby records and possible presence of suitable supporting habitat.

4.1.2. Conservation Significant Fauna Species

Conservation significant fauna species previously recorded within and in proximity to the survey area by Phoenix (2025b) are presented in Figure 9. The pre-survey fauna likelihood of occurrence is provided in Appendix H. Prior to the field survey, all 25 conservation significant fauna species identified from the desktop review of the Phoenix (2025b) report were considered as having Potential to occur, due to the proximity of the nearby records and possible presence of suitable supporting habitat.

4.1.3. Conservation Significant Ecological Communities

Conservation significant ecological communities previously recorded within and in proximity to the survey area by Phoenix (2025a) are presented in Figure 10. The pre-survey ecological communities' likelihood of occurrence assessment is provided in Appendix I. Prior to the field survey one of the eight conservation significant ecological communities' identified from the desktop assessment were considered as having Potential to occur in the survey area, namely the Scott River Ironstone Association (listed as EN under the EPBC Act and BC Act).

The seven remaining conservation significant ecological communities identified from the pre-survey desktop assessment were considered Unlikely to occur in the survey area.

4.1.4. Black Cockatoo Habitat

A total of 96 records of Black Cockatoos were identified during the Phoenix (2025b) survey comprising 36 records of Carnaby's Cockatoo, 7 records of Baudin's Cockatoo and 53 records of Forest Red-tailed Black Cockatoo.

According to Phoenix (2025b), no known breeding sites are located within 14 km of the survey area. In total 756 potential breeding trees were identified during the survey. Potential breeding trees were defined by Phoenix (2025b) as any tree with a DBH >500 mm that do not currently contain a suitable breeding hollow. In addition, four suitable breeding trees were identified (Phoenix 2025b; Figure 12; Figure 13). Suitable breeding trees were defined as having a suitable DBH >500 mm and a suitable hollow, but with no evidence of usage (Phoenix 2025b).

No evidence of roosting by Black Cockatoos was recorded by Phoenix (2025b). However, known roosting sites are present within 15 km, and tree species that are known to provide roosting habitat (*Eucalyptus* spp., *Corymbia calophylla* and *Pinus* sp.) were present within the study area (Phoenix 2025b).

Phoenix (2025b) assessed the foraging values for Carnaby's Cockatoo, Baudin's Cockatoo and Forest Red-tailed Black Cockatoo (collectively referred to as Black Cockatoos) using the Bamford (2021) method. The extent of each foraging habitat quality within the Phoenix (2025b) study area is presented in Table 5 and presented in Figure 11, Figure 12 and Figure 13.

Table 5: Quality and Extent of Black Cockatoo foraging habitat in proximity to the survey area (Phoenix 2025b)

Habitat quality score	Extent identified by Phoenix (2025b) (ha)		
	Carnaby's	Baudin's	Forest Red-tailed
None (0)	1.7	3,191.6	3,443.6
Low (1-4)	3190.0	261.8	15.9
Moderate (5-7)	620.6	392.1	261.6
High (8-10)	79.3	46.1	170.5
Total	3,891.6	3,891.6	3,891.6

4.1.5. Western Ringtail Possum Habitat

Nine records of Western Ringtail Possum were identified during the Phoenix (2025b) survey. The closest records are located approximately 1.8 km northwest of the survey area within Marri-Jarrah-Peppermint woodlands. The habitat quality for Western Ringtail Possum habitat was assessed based on habitat suitability, site context and species stocking rate and aligned with the methodologies used in this survey (Phoenix 2025b). A total of 201 ha of Moderate to High value Western Ringtail Possum habitat was identified within the Phoenix (2025b) study area (Figure 14). Higher value habitat in the area was generally associated with Marri-Jarrah Peppermint woodlands with high canopy continuity (Phoenix 2025b).

Figure 8: Conservation significant flora recorded in the vicinity of the survey area (Phoenix 2025a)

Survey area
Phoenix (2025a) Study Area

Conservation significant flora

- *Adenanthos detmoldii* — P4
- *Adenanthos x pamela* — P4
- *Aotus carinata* — P4
- *Banksia meisneri subsp. ascendens* — P4
- *Banksia nivea subsp. uliginosa* — EN (EPBC and BC Acts)
- *Boronia anceps* — P3
- *Calothamnus lateralis var. crassus* — P3
- *Chorizema carinatum* — P3
- *Conospermum quadripetalum* — CR (BC Act)
- *Dampiera heteroptera* — P3
- *Darwinia ferricola* — EN (EPBC and BC Acts)
- *Drosera fimbriata* — P4
- *Gastrolobium formosum* — P3
- *Grevillea brachystylis subsp. australis* — VU/EN (EPBC and BC Acts)
- *Grevillea manglesioides subsp. ferricola* — P3
- *Grevillea papillosa* — P3
- *Isopogon formosus subsp. dasylepis* — P3
- *Lambertia orbifolia subsp. vespera* — EN (EPBC andBC Acts)
- *Leucopogon alternifolius* — P3
- *Leucopogon wheelerae* — P3
- *Loxocarya magna* — P3
- *Melaleuca basicephala* — P4
- *Netrostylis sp. Blackwood River (A.R. Annels 3043)* — P3
- *Stylidium leeuwinense* — P4
- *Synaphea nexosa* — P1
- *Verticordia plumosa var. vassensis* — EN (EPBC and BC Acts)

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Kilometres

Datum/Projection:
GDA 1994 MGA Zone 50

24PER7886-KR Date: 24/07/2025

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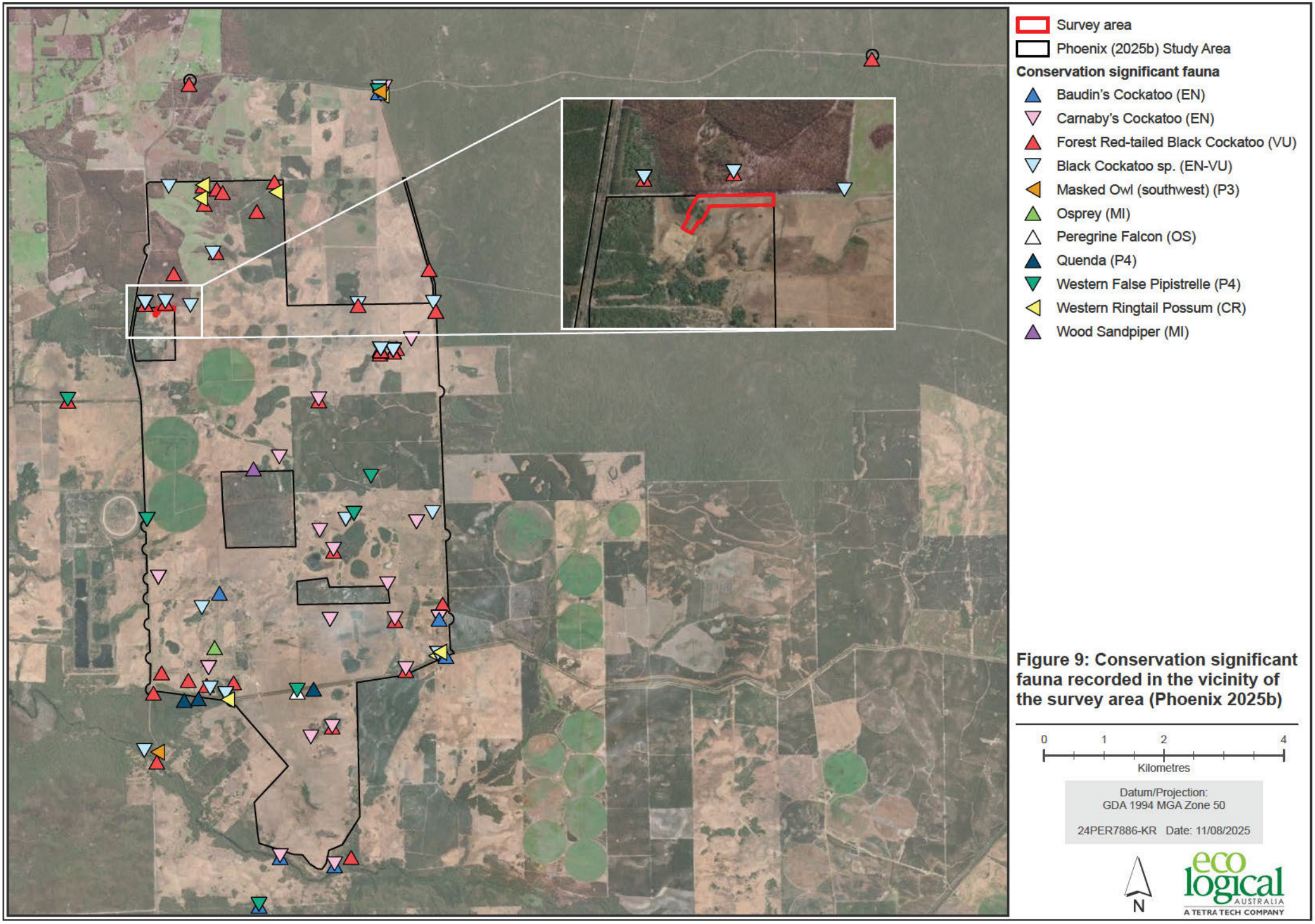

Figure 9: Conservation significant fauna recorded in the vicinity of the survey area (Phoenix 2025b)

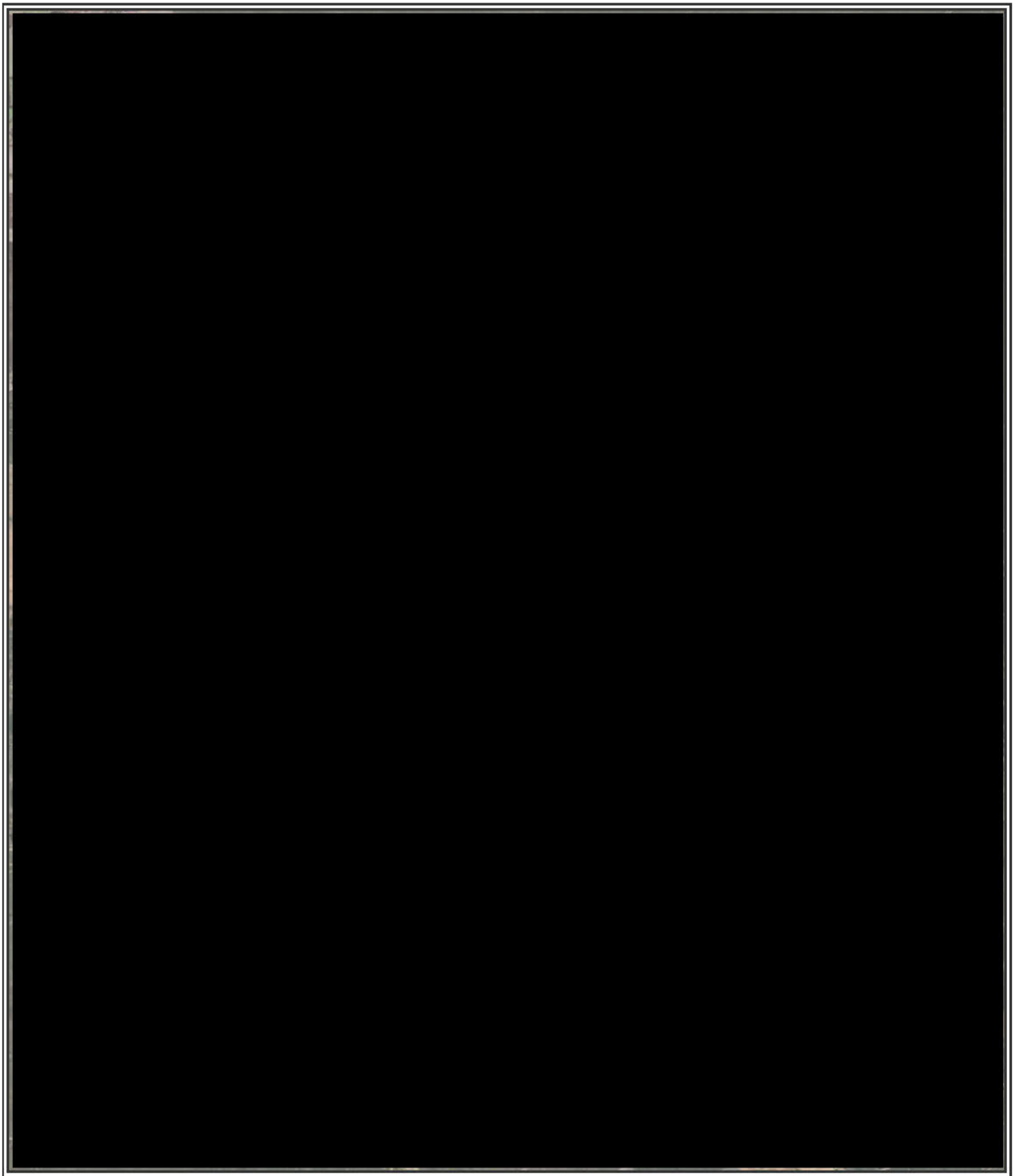

Figure 10: Conservation significant ecological communities previously recorded in the vicinity of the survey area (Phoenix 2025a)

Survey area

Phoenix (2025a) Study Area

Conservation significant ecological communities (Phoenix 2025a)

Scott River Ironstone Association — EN (EPBC & BC Acts)

0 0.5 1 2

Kilometres

Datum/Projection:
GDA 1994 MGA Zone 50

24PER7886-KR Date: 24/07/2025

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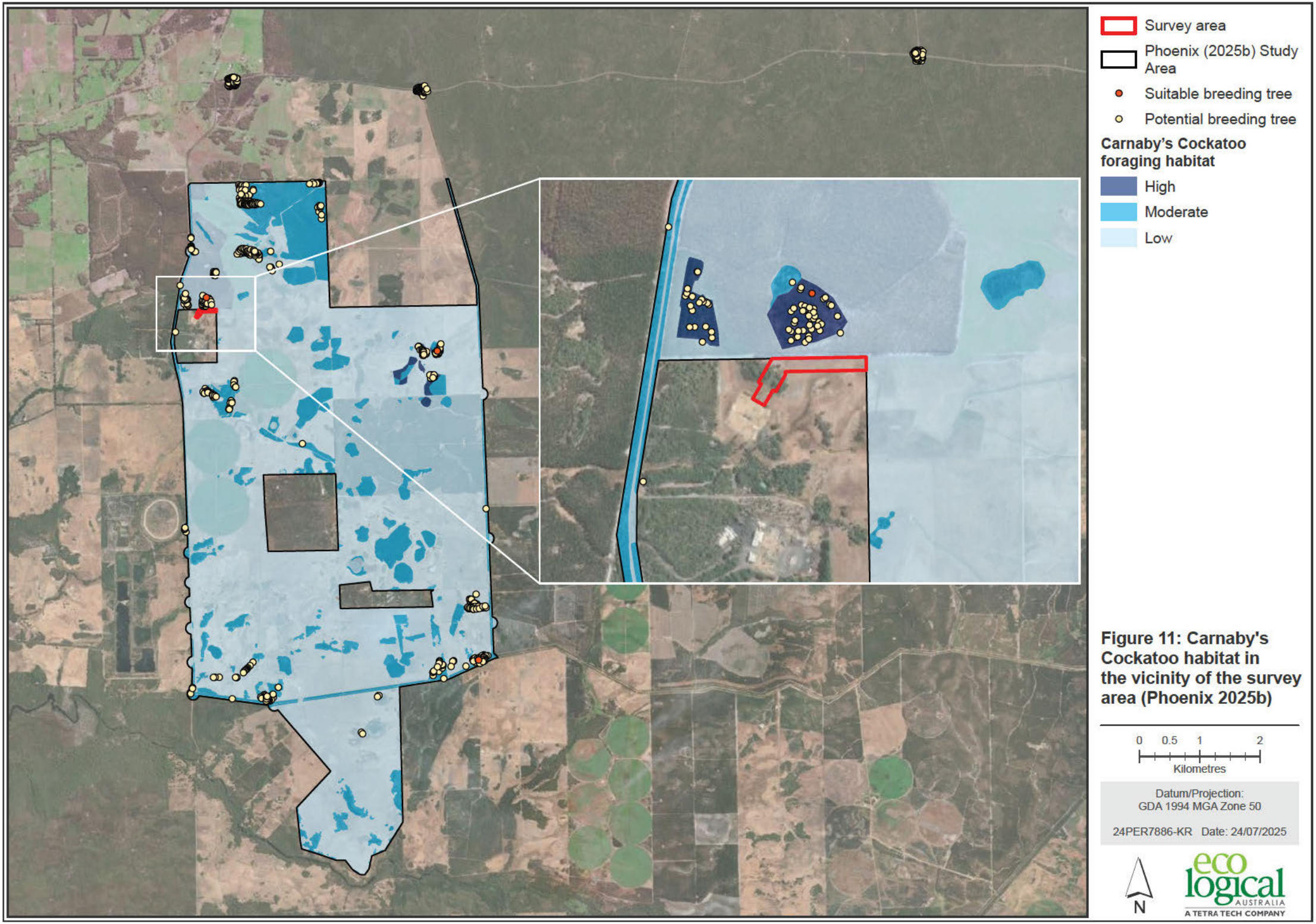

Figure 11: Carnaby's Cockatoo habitat in the vicinity of the survey area (Phoenix 2025b)

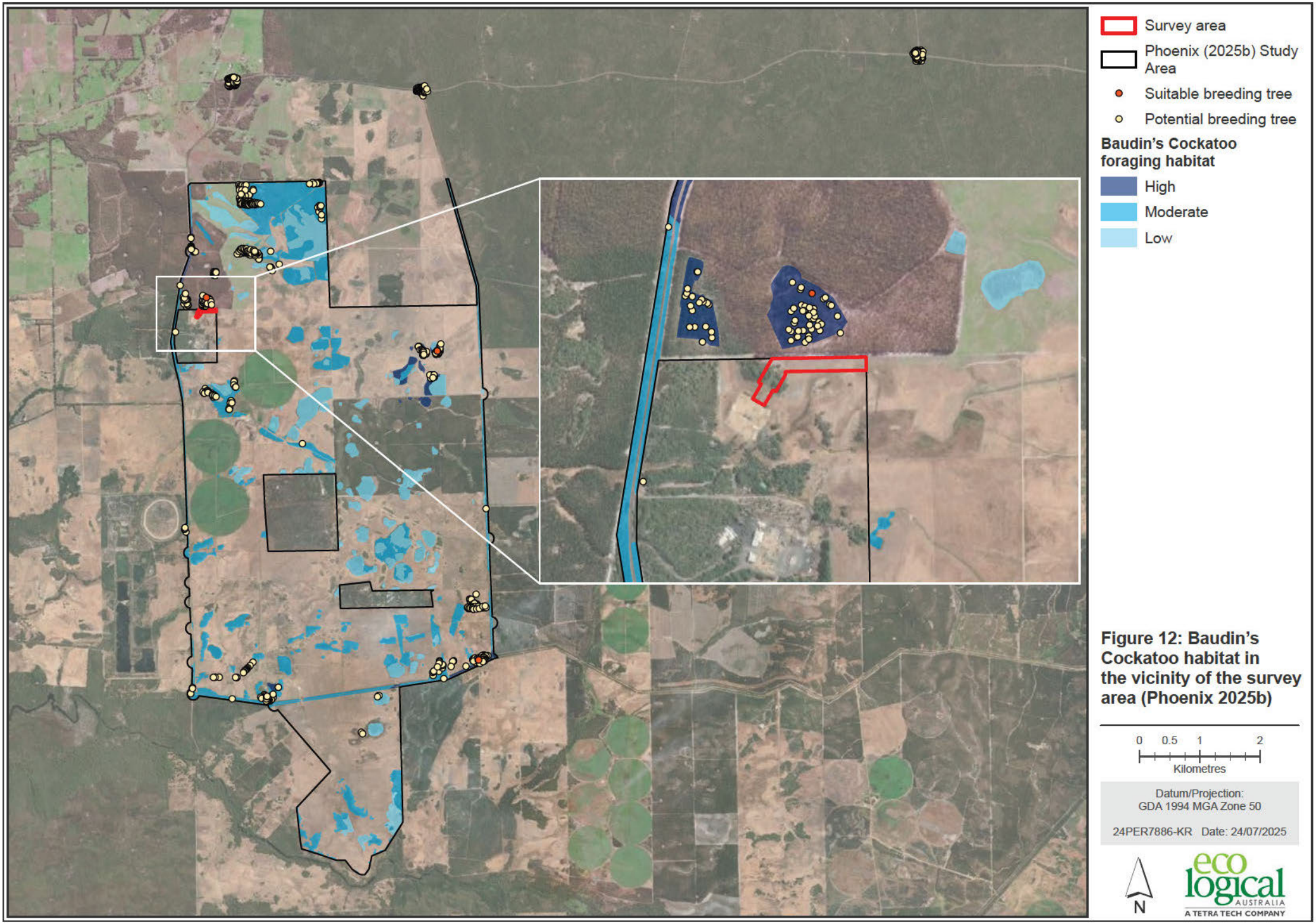

Figure 12: Baudin's Cockatoo habitat in the vicinity of the survey area (Phoenix 2025b)

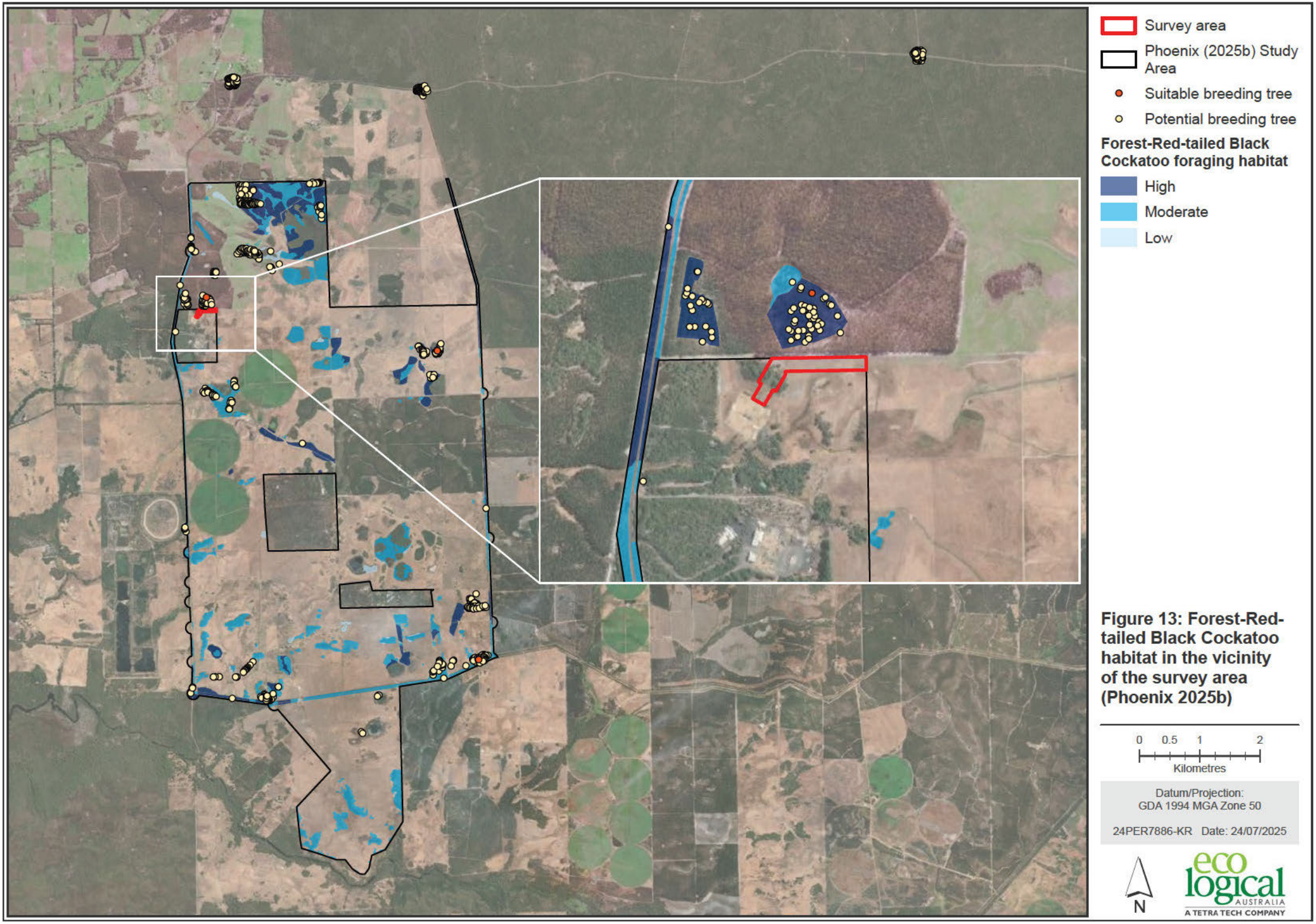

Figure 13: Forest-Red-tailed Black Cockatoo habitat in the vicinity of the survey area (Phoenix 2025b)

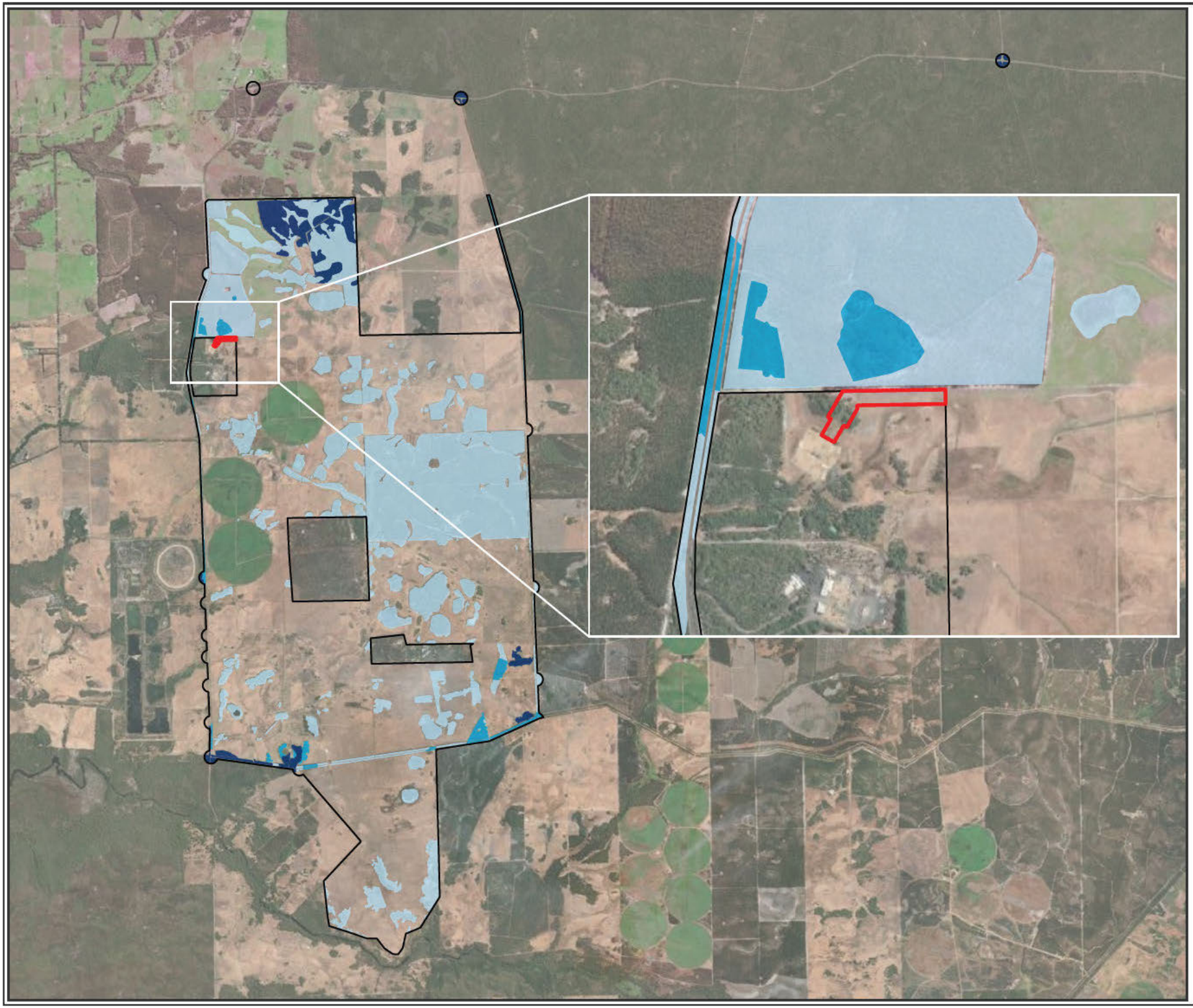

Figure 14: Western Ringtail Possum habitat in the vicinity of the survey area (Phoenix 2025b)

4.2. Flora and Vegetation Survey

4.2.1. Flora Overview

A total of 24 species (19 native and five introduced) from 15 families and 23 genera were recorded across the three relevés. Average species richness per relevé was 14 species, ranging from 13 species at REL01 and REL02 to 15 species at REL03. The families with the greatest number of species were Asteraceae and Myrtaceae (four species each). *Xanthorrhoea* was the best represented genus throughout the survey with two taxa recorded. A full flora list is provided in Appendix J and ELA relevé data is provided in Appendix K.

4.2.2. Conservation Significant Flora

No Threatened flora species listed under the EPBC Act or the BC Act, or Priority species listed by DBCA were recorded within the survey area. Of the 66 conservation listed flora species identified from the desktop assessment as possibly occurring, a post-survey likelihood of occurrence assessment determined that nine flora species have the Potential to occur within the survey area, namely:

- *Darwinia ferricola* (listed as VU under the EPBC Act and EN under the BC Act)
- *Conospermum quadripetalum* (listed as CR under the BC Act)
- *Stylidium* sp. Scott River Plain (N.G. Marchant 74/23) (listed as Priority 1 [P1] by DBCA)
- *Philydrella pygmaea subsp. minima* (listed as P1 by DBCA)
- *Hemigenia* sp. Nillup (R.D. Royce 98) (listed as P2 by DBCA)
- *Leucopogon incisus* (listed as P2 by DBCA)
- *Acacia lateriticola* glabrous variant (B.R. Maslin 6765) (listed as P3 by DBCA)
- *Synaphea petiolaris* subsp. *simplex* (listed as P3 by DBCA)
- *Chorizema carinatum* (listed as P3 by DBCA).

This assessment is based on the presence of suitable habitat for these species within the survey area and the proximity of nearby records. Some species may also be cryptic and therefore not detectable during the out of season field survey. The remaining 57 species were considered Unlikely to occur within the survey area based on either the lack of suitable habitat, the distance of previous records and the conspicuity of the species. The flora likelihood of occurrence assessment is presented in Appendix G.

4.2.3. Introduced Flora

A total of five introduced (weed) species were recorded in the survey area, namely **Arctotheca calendula* (Capeweed), **Hypochaeris glabra* (Flatweed), **Ursinia anthemoides* (South African marigold), **Romulea rosea* (Onion grass) and **Briza maxima* (Quaking grass). None of these species are listed as a Declared Pest – s22(2) under the *Biosecurity and Agriculture Management Act 2007* (BAM Act) or Weeds of National Significance (WoNS). All of these species are listed as Permitted (s11) species, indicating that no specific management of these species is required.

4.2.4. Vegetation Types

A total of two vegetation types were described and mapped in the survey area, namely CcTpCeOh (0.2 ha; 13% of the survey area) and XpAs (0.2 ha; 10% of the survey area). These vegetation types were

aligned with those originally mapped by Phoenix (2025a). Descriptions of and the extent of these vegetation types within the survey area is provided in Table 6.

Table 6: Vegetation types recorded within the survey area

Photo	Vegetation Type	Description*	Relevés	Extent within survey area (ha) (%)
	CcTpCeOh	Mid woodland to open forest of *Corymbia calophylla*, *Eucalyptus marginata subsp. marginata*, and occasionally *Agonis flexuosa var. flexuosa*, over variable mid to tall sparse shrubland to shrubland of *Taxandria parviceps*, *Xanthorrhoea preissii*, and *Acacia myrtifolia*, over tall sedgeland of *Cyathochaeta equitans*, *Anarthria scabra*, and *Hypolaena caespitosa*, over low sparse forbland of *Opercularia hispidula*, *Patersonia occidentalis* var. *latifolia*, and *Dasypogon bromeliifolius*.	REL01, REL02	0.2 (12%)
	XpAs	Mid sparse to open shrubland of *Xanthorrhoea preissii*, *Gompholobium tomentosum*, and *Taxandria parviceps*, over tall open to closed sedgeland of *Anarthria scabra*, *A. prolifera*, and *Hypolaena caespitosa*.	REL03	0.2 (12%)
	Cleared	Cleared areas.	-	1.3 (76%)
Total				1.7 (100%)

*Descriptions of the vegetation types have been adopted from Phoenix (2025a)

Figure 15: Vegetation types within the survey area

4.2.5. Vegetation of Conservation Significance

No vegetation types described and mapped within the survey area are considered to represent any TECs listed under the EPBC Act or BC Act or Priority Ecological Communities (PECs) listed by DBCA (Appendix I).

Vegetation within the survey area was assessed against the key diagnostic characteristics outlined in the Scott River Ironstone Association approved conservation advice (DSEWPaC 2013) to determine the presence of the TEC in the survey area. The primary defining features of the Scott River Ironstone Association TEC include location, substrates, species assemblages and condition. Based on the assessment, it was determined that the Scott River Ironstone Association was not present within the survey area. This was due to the absence of key floristic components such as *Melaleuca preissiana*, *Hakea tuberculata*, *Kunzea micrantha* or *Melaleuca incana* subsp. Gingilup (N.Gibson & M.Lyons 593) (grey honey-myrtle) and a lack of suitable landform characteristics including shallow reddish loamy sands and ironstone substrate. The Scott River Ironstone Association TEC is also defined as a shrubland or heathland with an open to closed structure. The vegetation types within the survey area, particularly CcTpCeOh, do not align with this structure type.

The assessment of vegetation against the key diagnostic characteristics for this TEC is presented in Appendix L.

4.2.6. Vegetation Condition

The condition of intact native vegetation within the survey area ranged from Degraded to Excellent (Table 7; Figure 14), based on the vegetation condition scale of Keighery (1994) provided in EPA (2016) for the South West Botanical Province. Most of the vegetated part of the survey area was classed as being in Degraded condition and were mostly located in proximity to the existing power line. Disturbances within the survey area included grazing, weeds and clearing.

Table 7: Vegetation Condition within the survey area

Vegetation condition	Relevés	Extent within survey area (ha) (%)
Excellent	REL01	0.1 (6%)
Very Good	REL02	0.1 (6%)
Degraded	REL03	0.2 (12%)
Cleared	-	1.3 (76%)
Total		1.7 (100%)

Figure 16: Vegetation condition within the survey area

0 12.5 25 50
Metres

Datum/Projection:
GDA 1994 MGA Zone 50

24PER7886-KR Date: 18/07/2025

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4.3. Basic Fauna Survey

4.3.1. Fauna Overview

A total of ten vertebrate fauna species (including one introduced species) were recorded within the survey area, comprising nine birds and one mammal. A complete fauna list is presented in Appendix M.

4.3.2. Conservation Significant Fauna

No direct (observations) or indirect (scats, tracks, diggings) evidence of Threatened fauna species listed under the EPBC Act or the BC Act, or Priority fauna species as listed by DBCA were recorded within the survey area.

Of the 25 conservation significant fauna species identified from the desktop assessment as potentially occurring within the survey area, a post-survey likelihood of occurrence assessment determined that three species are considered Likely to occur within the survey area, namely:

- Baudin's Cockatoo (*Zanda baudinii*; listed as EN under the EPBC Act and BC Act)
- Carnaby's Cockatoo (*Zanda latirostris*; listed as EN under the EPBC Act and BC Act)
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*; listed as VU under the EPBC Act and BC Act).

An additional seven fauna species were considered to have the Potential to occur, including:

- Western Ringtail Possum (*Pseudocheirus occidentalis;* listed as CR under the EPBC Act and BC Act)
- Chuditch (*Dasyurus geoffroii*; listed as VU under the EPBC Act and BC Act)
- South-western Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*; listed as Conservation Dependent [CD] under the BC Act)
- Peregrine Falcon (*Falco peregrinus*; listed as Other specially protected species [OS] under the BC Act)
- Masked Owl (southwest) (*Tyto novaehollandiae novaehollandiae*; listed as P3 by DBCA)
- Western False Pipistrelle (*Falsistrellus mackenziei;* listed as P4 by DBCA)
- Quenda (*Isoodon fusciventer*; listed as P4 by DBCA).

This assessment is based on the availability of suitable habitat for these species within the survey area, as well as the location of previous records. The remaining 15 species were considered Unlikely to occur within the survey area, based on lack of suitable habitat present.

4.3.3. Introduced Fauna

One introduced fauna species was recorded within the survey area, namely the Laughing Kookaburra (**Dacelo novaeguineae*). This species is listed as Permitted (s11) under the State BAM Act (DPIRD 2025).

4.3.4. Fauna Habitat

A total of two fauna habitats were recorded within the survey area, namely Marri-Jarrah-Peppermint Woodland (0.2 ha; 12% of the survey area) and Cleared – Degraded Sumpland (0.2 ha; 12% of the survey area). Like the mapped vegetation types, these fauna habitats were aligned with those mapped in the

survey undertaken by Phoenix (2025b). Descriptions of and the extent of these vegetation types is provided in Table 8.

Table 8: Fauna habitat recorded within the survey area

Photo	Fauna habitat	Relevés	Total (ha) (%)
	Marri-Jarrah-Peppermint Woodland	REL01, REL02	0.2 (12%)
	Cleared – Degraded Sumpland	REL03	0.2 (12%)
	Cleared	-	1.3 (76%)
Total			1.7 (100%)

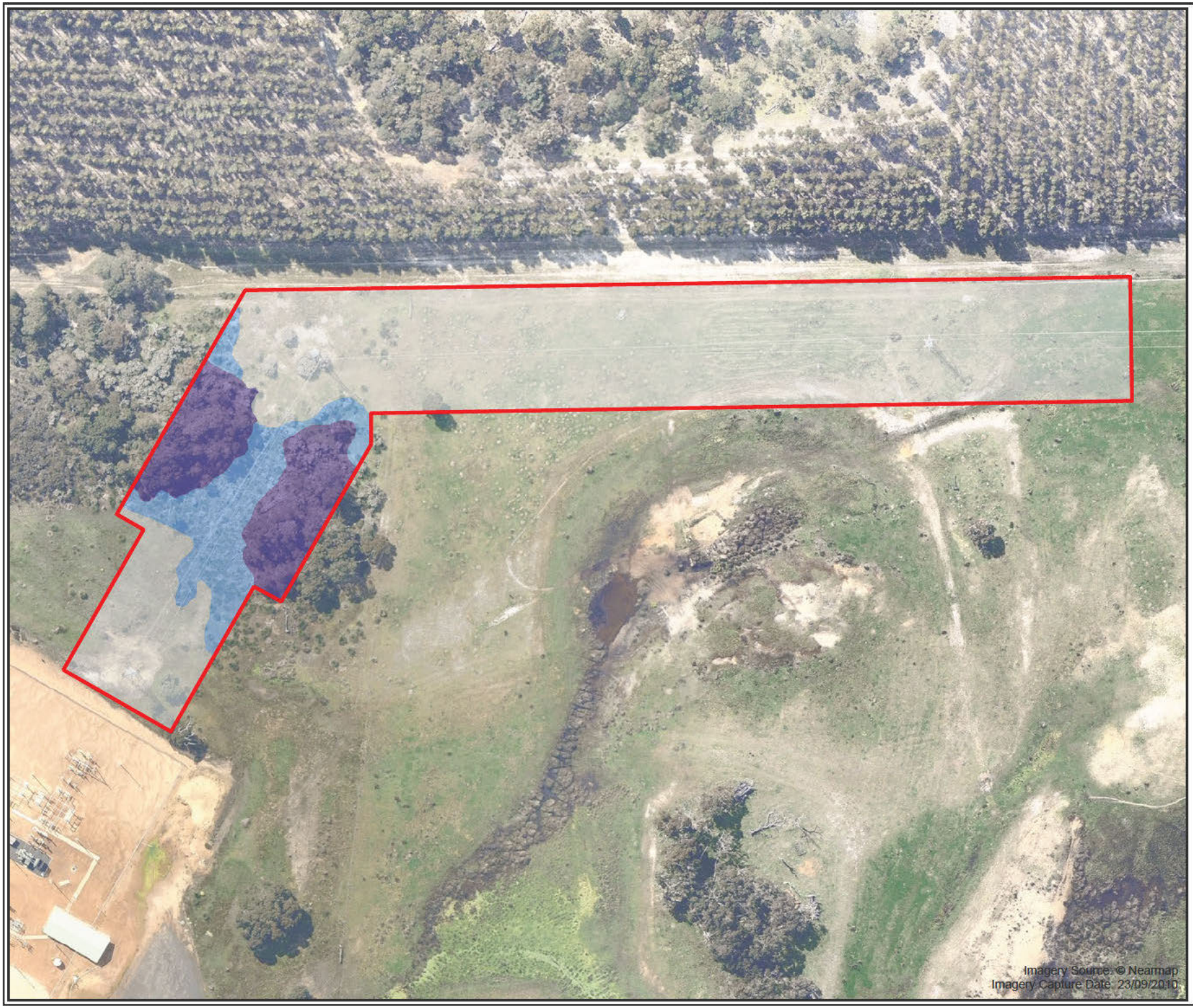

Figure 17: Fauna habitat recorded within the survey area

4.4. Black Cockatoo Habitat Assessment

A targeted assessment of potential foraging, breeding and roosting habitat for Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) and Baudin's Cockatoo (*Zanda baudinii)* was undertaken within the survey area. Only foraging and roosting habitat was assessed for Carnaby's Cockatoo (*Zanda latirostris)* given the survey area does not overlap with its breeding range. No secondary evidence (i.e. foraging evidence) was recorded in the survey area during the assessment. Potential foraging, breeding, and roosting habitat within the survey area is described in the sections below.

4.4.1. Foraging Habitat

Foraging habitat quality was assessed using two methods, DAWE (2022) and Bamford (2021).

In accordance with the DAWE (2022) scoring tool the Marri-Jarrah-Peppermint woodland fauna habitat was considered High quality foraging habitat for Baudin's Cockatoo and Forest Red-tailed Black Cockatoo and Moderate for Carnaby's Cockatoo (Table 10). The Cleared-Degraded Sumpland fauna habitat was considered High quality for Baudin's Cockatoo and Moderate quality for Carnaby's Cockatoo, given the presence of foraging species *Xanthorrhoea preissii*. However, this habitat provides no value to Forest Red-tailed Black Cockatoo and was assigned a score of 0.

Table 9: DAWE (2022) foraging habitat scores per habitat type

Fauna Habitat	Extent of habitat type (ha)	Foraging Habitat Score		
		Baudin's Cockatoo	Carnaby's Cockatoo	FRTBC
Marri-Jarrah-Peppermint woodland	0.2	8 (High)	6 (Moderate)	8 (High)
Cleared-Degraded Sumpland	0.2	8 (High)	6 (Moderate)	0 (None)

In accordance with the Bamford (2021) scoring tool a total of 0.2 ha of vegetation within the survey area was mapped as High quality foraging habitat for all three Black Cockatoo species (Table 9), given the density of suitable foraging species within the Marri-Jarrah-Peppermint woodland fauna habitat type (Figure 18; Figure 19). The Cleared-Degraded Sumpland fauna habitat was considered to have Moderate foraging value for Baudin's Cockatoo and Carnaby's Cockatoo, given the high density of foraging species *Xanthorrhoea preissii*. However, no suitable foraging species for Forest Red-tailed Black Cockatoo were present within the Cleared-Degraded Sumpland fauna habitat; therefore, a score of 0 was assigned.

Table 10: Bamford (2021) Black Cockatoo foraging habitat scores per habitat type

Fauna Habitat	Extent of Habitat Type (ha)	Foraging Habitat Score		
		Baudin's Cockatoo	Carnaby's Cockatoo	FRTBC
Marri-Jarrah-Peppermint woodland	0.2	8 (High)	8 (High)	8 (High)
Cleared-Degraded Sumpland	0.2	5 (Moderate)	5 (Moderate)	0 (None)

4.4.2. Potential Breeding and Roosting Habitat

A total of ten potentially suitable breeding trees were recorded within the survey area (Figure 20). These trees all had a hollow rank of four (i.e. tree lacking suitable hollows or broken branches that might have large hollows; a tree with mainly intact branches and a spreading crown). Five of these trees contained

hollows, although all of these were considered unsuitable for breeding due to their insufficient size (< 10 cm) or orientation. The Marri-Jarrah-Peppermint Woodland fauna habitat where the suitable breeding trees are located was considered potentially suitable roosting habitat given the presence of tall Eucalypt trees and proximity to water sources.

Figure 18: Foraging habitat for Carnaby's and Baudin's Cockatoo within the survey area (Bamford 2021)

Figure 19: Foraging habitat for Forest Red-tailed Black Cockatoo within the survey area (Bamford 2021)

Figure 20: Potential breeding and roosting habitat within the survey area

4.5. Western Ringtail Possum Habitat Assessment

No primary observations of Western Ringtail Possums were made during the Targeted survey. In addition, no secondary evidence (i.e. dreys) was encountered.

A total of 0.2 ha (12% of the survey area) of Moderate quality habitat was recorded during the survey (Figure 21) and comprised solely of the Marri-Jarrah Peppermint woodland fauna habitat type. The remainder of the survey area was assessed as providing no habitat value to Western Ringtail Possum due to a lack of continuous canopy.

Figure 21: Western Ringtail Possum habitat within the survey area

0 12.5 25 50
Metres

Datum/Projection:
GDA 1994 MGA Zone 50

24PER7886-KR Date: 18/07/2025

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5. Discussion

5.1. Flora and Vegetation

5.1.1. Flora

Flora species recorded generally aligned with those encountered during the Phoenix (2025a) survey and were typical of the Warren bioregion (WAH 1998). No Threatened flora species listed under the EPBC Act or BC Act, or as Priority by DBCA were recorded within the survey area.

Of the 66 conservation listed flora species identified from the desktop assessment as possibly occurring, a post-survey likelihood of occurrence assessment determined that nine flora species are considered as having the Potential to occur within the survey area, including *Darwinia ferricola* (listed as VU under the EPBC Act and EN under the BC Act), *Conospermum quadripetalum* (listed as CR under the BC Act), *Stylidium* sp. Scott River Plain (listed as P1 by DBCA), *Philydrella pygmaea subsp. minima* (listed as P1 by DBCA), *Hemigenia* sp. (listed as P2 by DBCA), *Leucopogon incisus* (listed as P2 by DBCA), *Acacia lateriticola* glabrous variant (listed as P3 by DBCA), *Synaphea petiolaris* subsp. *simplex* (listed as P3 by DBCA) and *Chorizema carinatum* (listed as P3 by DBCA). Within the survey area, potentially suitable habitat for these species may be present to varying degree, within the CcTpCeOh and XpAs vegetation types. To confirm the presence or absence of these species, targeted flora surveys will need to be conducted within the appropriate flowering period for each species.

Approximately 21% of all flora species recorded during the current survey were introduced species. This is reflective of the location of the survey area within a highly modified and fragmented landscape. No Declared Pests or WoNS were recorded during the survey.

5.1.2. Vegetation

A total of two vegetation types (CcTpCeOh and XpAs) were described and mapped during the current survey, accounting for 0.39 ha of the total survey area. The assessment of vegetation types sought to expand on the mapping completed by Phoenix (2025a) and have been assigned as closely as possible. While the floristic composition of vegetation within the survey area and the vegetation types described by Phoenix (2025a) did not completely align (due to factors such as scale and survey type), vegetation types were considered to be representative of mapping by Phoenix (2025a).

Vegetation condition within the survey area ranged from Degraded to Excellent, based on the vegetation scale adapted from Keighery (1994) as outlined in the *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016). Majority of vegetation within the survey area was classed as being in Degraded condition. The patch of CcTpCeOh in the western portion of the survey area (associated with REL01) represented vegetation with the highest condition in the survey area, and the entire patch was mapped as Excellent. Meanwhile, the patch of CcTpCeOh in the eastern portion of the survey area (associated with REL02) was mapped as Very Good. The XpAs community was of the lowest condition within the survey area and was mapped as Degraded. Cleared areas comprised 1.3 ha (78%) of the survey area.

The vegetation types do not represent the Scott River Ironstone Association TEC based on an assessment against the key diagnostic characteristics described by DSEWPaC (2013) as it does not contain any of the key indicator species of the TEC and does not occur on ironstone overlain by shallow reddish soils. A key indicator of Scott River Ironstone Association TEC is that its structure comprises a shrubland or heathland with an open to closed structure. The vegetation types within the survey area, particularly

CcTpCeOh, do not align with this structure type. This aligns with the conclusion made by Phoenix (2025a), that CcTpCeOh and XpAs vegetation types were not representative of this TEC.

5.2. Fauna

A total of two fauna habitat types (Marri-Jarrah-Peppermint woodland and Cleared-Degraded Sumpland) were described and mapped within the survey area. These two fauna habitats are considered to provide suitable habitat for several terrestrial and avian fauna species, with habitats providing a mix of suitable vegetation, substrate, and microhabitats.

A total of ten vertebrate fauna species were recorded during the Basic fauna survey, comprising nine birds and one mammal. The species recorded represent a snapshot of the fauna occurring within the survey area at the time of field survey, and it is therefore likely that more species occur than were observed. Of the species recorded - Laughing Kookaburra (**Dacelo novaeguineae*) - is listed as Permitted (s11) under the State BAM Act (DPIRD 2025).

No direct (observations) or indirect (scats, tracks, diggings, dreys, nests) evidence of Threatened fauna species listed under the EPBC Act or the BC Act, or Priority fauna species listed by DBCA were recorded within the survey area. Of the 25 conservation significant fauna species identified from the desktop assessment as possibly occurring within the survey area, it was assessed that all three species of Black Cockatoo were considered Likely to occur following the field survey, given the presence of high value habitat within the survey area. These are discussed further in Section 5.2.1. A further seven species had Potential to occur following the field survey, comprising five mammals and two birds.

5.2.1. Black Cockatoos

The survey area is located in the 'Likely to occur' modelled distribution for the Carnaby's, Baudin's and Forest Red-tailed Black Cockatoos and as such each of these species were the focus of this assessment (DAWE 2022). The survey area occurs within the known breeding range of Baudin's and Forest Red-tailed Black Cockatoo; however is outside the breeding range of Carnaby's Cockatoo. Phoenix (2025b) recorded a total of 96 records of Black Cockatoo adjacent to the survey area, comprising 36 records of Carnaby's Cockatoo, 7 records of Baudin's Cockatoo and 53 records of Forest Red-tailed Black Cockatoo.

The *Carnaby's Cockatoo Recovery Plan* defines critical non-breeding habitat for Carnaby's Cockatoo as vegetation that provides food resources as well as the sites for nearby watering and night roosting that enable the cockatoos to effectively utilise the available food resources (DPaW 2013). Habitat critical to the survival of the Forest Red-tailed Black Cockatoo and Baudin's Cockatoo includes all Marri (*Corymbia calophylla*), Karri (*Eucalyptus diversicolor*), and Jarrah (*Eucalyptus marginata*) forests, woodlands, and remnants in the south-west of Western Australia receiving more than 600 mm of annual average rainfall (DAWE 2022).

No primary or secondary evidence (i.e. foraging evidence) of Black Cockatoos was recorded in the survey area. A total of 0.2 ha (12% of the survey area) was mapped as High value foraging habitat for all three Black Cockatoo species, as there was a high density and condition of suitable foraging species within the Marri-Jarrah-Peppermint woodland fauna habitat, including Marri (*Corymbia calophylla*), Jarrah (*Eucalyptus marginata*) and *Xanthorrhoea preissii*. An assessment of this fauna habitat type against the DAWE (2022) scoring tool also found the vegetation present to represent High quality foraging habitat, with a score of 8 assigned for Baudin's Cockatoo and Forest Red-tailed Black Cockatoo, and 6 assigned for Carnaby's Cockatoo.

The Cleared-Degraded Sumpland fauna habitat was mapped as Moderate quality for Baudin's Cockatoo and Carnaby's Cockatoo, given the high foliage cover of *Xanthorrhoea preissii* throughout this habitat's

extent. This fauna habitat provides no value for Forest Red-tailed Black Cockatoo as no known primary or secondary food plants were present. An assessment of this fauna habitat type against the DAWE (2022) scoring tool found the vegetation present to represent High quality foraging habitat for Baudin's Cockatoo and moderate quality foraging habitat for Carnaby's Cockatoo. However, this fauna habitat provided no value for Forest Red-tailed Black Cockatoo given that the vegetation present does not align with the description of habitat for the species (i.e. Jarrah/Marri woodland, edges of Karri forest, forest containing Wandoo or Blackbutt; DAWE 2022).

The Black Cockatoo habitat assessment closely aligns with the conclusions made by Phoenix (2025b), where the Marri-Jarrah-Peppermint woodland fauna habitat type was generally mapped as Moderate to High quality habitat and habitat patches containing high foliage cover of *Xanthorrhoea preissii* as Moderate quality habitat.

The survey area contains ten potentially suitable breeding trees (>500 mm DBH). All trees lacked hollows suitable for Black Cockatoo breeding, and no evidence of use by Black Cockatoos was recorded.

Given the presence of tall trees and the proximity to water sources nearby (i.e., within 12 km of the survey area, namely the Blackwood River and Scott River) the Marri-Jarrah-Peppermint woodland fauna habitat was considered to represent potential night-roosting habitat for black cockatoos.

5.2.2. Western Ringtail Possum

The Western Ringtail Possum (*Pseudocheirus occidentalis*) is listed as CR under the EPBC Act and the BC Act. Once widely distributed, the current distribution of the Western Ringtail Possum has contracted with extensive local declines in the northern and inland fragments of the species' original range because of clearing and subsequent fragmentation during agricultural development in south-western WA (DEWHA 2009). Critical habitat is defined as 'any habitat where Western Ringtail Possums occur naturally', which generally comprises *'long unburnt mature remnants of peppermint (Agonis flexuosa) woodlands with high canopy continuity and high foliage nutrients (high in nitrogen and low toxin levels); jarrah (Eucalyptus marginata)/marri (Corymbia calophylla) forests and woodlands'* (DPaW 2017). Linkages between suitable habitat patches are also considered critical to the species survival (DPaW 2017). Tree hollows are important as diurnal resting sites (refuges) and nests (dreys). Other suitable refuges include platforms, hollow logs, balga (*Xanthorrhoea* spp.) skirts, under sedges, forest debris and disused rabbit warrens (DEWHA 2009). The Recovery Plan has identified three key management zones for Western Ringtail Possum within Western Australia, namely the Swan Coastal Plain, Southern Forest and South Coast zone. The survey area is not located within a management zone; however, the Swan Coastal Plain Management Zone occurs directly to the east. Average home ranges in peppermint-dominated habitat are generally less than 2 ha and average 0.4 ha and 0.3 ha for females and males, respectively (DPaW 2017).

Phoenix (2025b) recorded nine individuals of Western Ringtail Possums and mapped 201 ha of Moderate to High value Western Ringtail Possum habitat in proximity to the survey area. Based on their field records, occurrences of Western Ringtail Possum in the general area were typically restricted to large remnants of Moderate to High quality Marri-Jarrah-Peppermint woodland, which were deemed of higher quality (Figure 12; Phoenix 2025b). Conversely, small, fragmented remnants of Marri-Jarrah Peppermint Woodland appeared too isolated to support the species, preventing it from traversing across the cleared paddocks towards larger remnants.

A total of 0.2 ha of vegetation in the survey area was mapped as Moderate quality habitat for Western Ringtail Possum and comprised solely of the Marri-Jarrah-Peppermint woodland fauna habitat. A Moderate quality score was considered appropriate given the Very Good to Excellent condition of the vegetation present and mostly continuous canopy cover. A score of High was not considered

appropriate given the patch was isolated from other suitable habitat fragments and that no evidence of Western Ringtail Possum was observed in the patch during the survey. However, to align with Phoenix (2025b), the maximum stocking rate score was still assigned for the entire survey area, given Western Ringtail Possums were recorded in the broader area.

No Western Ringtail Possum individuals or secondary evidence (i.e dreys) were recorded during the Targeted survey. However, survey outcomes may have been influenced by poor weather conditions including heavy rain, which could have inhibited both species activity and the ability of personnel to detect Western Ringtail Possum individuals (DSEWPaC 2011).

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Appendix A Framework for conservation significant flora and fauna ranking

CATEGORIES OF THREATENED SPECIES UNDER THE ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 (EPBC ACT)

Threatened fauna and flora may be listed in any one of the following categories as defined in Section 179 of the EPBC Act. Species listed as 'conservation dependent' and 'extinct' are not Matters of National Environmental Significance and therefore do not trigger the EPBC Act.

Category	Definition
Extinct (EX)	There is no reasonable doubt that the last member of the species has died.
Extinct in the Wild (EW)	Taxa known to survive only in captivity or as a naturalised population well outside its past range; or taxa has not been recorded in its known and/or expected habitat at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
Critically Endangered (CE)	Taxa considered to be facing an extremely high risk of extinction in the wild.
Endangered (EN)	Taxa considered to be facing a very high risk of extinction in the wild.
Vulnerable (VU)	Taxa considered to be facing a high risk of extinction in the wild.
Near Threatened (NT)	Taxa has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
Least Concern (LC)	Taxa has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.
Data Deficient (DD)	There is inadequate information to make a direct, or indirect, assessment of taxa's risk extinction based on its distribution and/or population status.
Not Evaluated (NE)	Taxa has not yet been evaluated against the criteria.
Migratory (IA)	Not an IUCN category. Species are defined as migratory if they are listed in an international agreement approved by the Commonwealth Environment Minister, including: • the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animal) for which Australia is a range state; • the agreement between the Government of Australian and the Government of the People's Republic of China for the Protection of Migratory Birds and their environment (CAMBA); • the agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA); or • the agreement between Australia and the Republic of Korea to develop a bilateral migratory bird agreement similar to the JAMBA and CAMBA in respect to migratory bird conservation and provides a basis for collaboration on the protection of migratory shorebirds and their habitat (ROKAMBA).

CONSERVATION CODES FOR WESTERN AUSTRALIA FLORA AND FAUNA

The Wildlife Conservation (Specially Protected Fauna) Notice 2018 and the Wildlife Conservation (Rare Flora) Notice 2018 have been transitioned under regulations 170, 171 and 172 of the Biodiversity Conservation Regulations 2018 to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the *Biodiversity Conservation Act 2016*.

Specially protected fauna or flora are species which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.

Threatened species (T)

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

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the Wildlife Conservation (Rare Flora) Notice 2018 for Threatened Flora.

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

Category	Code	Description
Critically Endangered species	CR	Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for critically endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for critically endangered flora.
Endangered species	EN	Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora.

Category	Code	Description
Vulnerable species	VU	Threatened species considered to be "facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for vulnerable flora.

Extinct species

Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild, as follows:

Category	Code	Description
Extinct species	EX	Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.
Extinct in the wild species	EW	Species that "is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act). Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

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

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

Categories are detailed below.

Category	Code	Description
Migratory species	MI	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act). Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species. Published as migratory birds protected under an international agreement under schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.
Species of special conservation interest (conservation dependent fauna)	CD	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act). Published as conservation dependent fauna under schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.
Other specially protected species	OS	Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act). Published as other specially protected fauna under schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.

Priority species (P)

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

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

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

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

Appendix B Likelihood of occurrence assessment criteria

Likelihood rating	Criteria
Recorded	The species has previously been recorded within study area from DBCA database search results and/or from previous surveys of the study area, and/or the species has been confirmed through a current vouchered specimen at WA Herbarium.
Likely	The species has not previously been recorded from within the study area. However, (to qualify requires one or more criteria to be met): • the species has been recorded in close proximity to the study area, and occurs in similar habitat to that which occurs within the study area • core habitat and suitable landforms for the species occurs within the study area either year-round or seasonally. In relation to fauna species, this could be that a host plant is seasonally present on site, or habitat features such as caves are present that may be used during particular times during its life cycle e.g. for breeding. In relation to both flora and fauna species, it may be there are seasonal wetlands present • there is a medium to high probability that a species uses the study area.
Potential	The species has not previously been recorded from within the study area. However, (one or more criteria requires to be met): • targeted surveys may locate the species based on records occurring in proximity to the study area and suitable habitat occurring in the study area • the study area has been assessed as having potentially suitable habitat through habitat modelling • the species is known to be cryptic and may not have been detected despite extensive surveys • the species is highly mobile and has an extensive foraging range so may not have been detected during previous surveys The species has been recorded in the study area by a previous consultant survey or there is historic evidence of species occurrence within the study area. However, (one or more criteria requires to be met): • doubt remains over taxonomic identification, or the majority of habitat does not appear suitable (although presence cannot be ruled out due to factors such as species ecology or distribution) • coordinates are doubtful.
Unlikely	The species has been recorded locally through DBCA database searches. However, it has not been recorded within the study area and • it is unlikely to occur due to the site lacking critical habitat, having at best marginally suitable habitat, and/or being severely degraded • it is unlikely to occur due to few historic record/s and no other current collections in the local area. The species has been recorded within the bioregion based on literature review but has not been recorded locally or within the study area through DBCA database searches. The species has not been recorded in the study area despite adequate survey efforts, such as a standardised methodology or targeted searching within potentially suitable habitat.
Does not occur (one or more criteria requires to be met).	The species is not known to occur within the IBRA bioregion based on current literature and distribution. The conspicuous species has not been recorded in the study area despite adequate survey efforts at an appropriate time of year to detect the species within potentially suitable habitat.

Likelihood rating	Criteria
	The study area lacks important habitat for a species that has highly selective habitat requirements. The species has been historically recorded within study area or locally; however, it is considered locally extinct due to significant habitat changes such as land clearing and/or introduced predators.

Appendix C Black Cockatoo habitat definitions

Habitat	Definition
Foraging habitat	Foraging habitat is defined as plant species known to support foraging within the range of each species. The specific foraging requirements differ slightly between the three species as described in DAWE 2022: • **Carnaby's Cockatoo** – mainly feeds in native shrubland, kwongkan heathland, and woodland. Food items include seeds, flowers, and nectar of native proteaceous plant species (i.e. *Banksia* spp., *Hakea* spp., *Grevillea* spp.), as well as *Callistemon* spp., and Marri (*Corymbia calophylla*). Also feeds on the seeds of introduced species including *Pinus* spp., *Erodium* spp., wild radish, canola, almonds, macadamia, and pecan nuts; insects and insect larvae; occasionally flesh and juice of apples and persimmons; and liquidambar. • **Baudin's Cockatoo** – mainly feeds in eucalypt woodlands and forest and proteaceous woodlands and heath. Food items primarily include seeds of Marri, rarely Jarrah (*Eucalyptus marginata*), and seeds of native proteaceous plant species (e.g. *Banksia* spp. and *Hakea* spp.). Also feeds on insects and insect larvae; pith of kangaroo paw (*Anigozanthos flavidus*); tips of *Pinus* spp.; *Macadamia* spp.; almonds and pecans; seeds of apples, pears, and persimmons. • **Forest Red-tailed Black Cockatoo** – mainly feeds in Jarrah and Marri woodlands and forest and edges of Karri (*Eucalyptus diversicolor*) forests including Wandoo (*E. wandoo*) and Blackbutt (*E. patens*). Food items primarily include seeds of Marri and Jarrah. Also feeds on *Allocasuarina* cones, fruits of Snottygobble (*Persoonia longifolia*) and Mountain Marri (*Corymbia haematoxylon*). Other less important foods include: Blackbutt, Bullich (*Eucalyptus megacarpa*), *Allocasuarina fraseriana, Hakea* spp., Tuart (*Eucalyptus gomphocephala*), Redheart Moit (*Eucalyptus decipiens*), and Bushy Yate (*Eucalyptus lehmanii*). Also some introduced eucalypts such as river red gum (*E. camaldulensis*) and flooded gum (*E. rudis*).
Night roosting habitat	Habitat that contains one, or a group of potential roosting trees: • **Known roosting tree** – a tree (generally the tallest), native or introduced known to be used for night roosting or which demonstrates evidence of roosting. Usually close to an important water source and within an area of high-quality foraging habitat. During the breeding season, male black cockatoos roost in the vicinity of the breeding trees, therefore a breeding area may also be considered to be night roosting habitat. • **Potential roosting tree** – A tall tree of any species in close proximity to water.
Breeding habitat	Habitat that contains known, suitable, or potential breeding trees: • **Known breeding tree** – Trees (live or dead but still standing) which contain a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks, or feathers). • **Suitable breeding tree –** Trees with suitable breeding hollows present, although no evidence of use. Note that any species of tree may develop suitable hollows for breeding. • **Suitable breeding hollow –** Any hollow with dimensions suitable for use for breeding by black cockatoos (Carnaby's Cockatoo 23-30 cm [EPA 2019], Baudin's Cockatoo 30-40 cm [Chapman 2008]. Forest Red-tailed Black Cockatoo 12-41cm [Chapman 2008]). Suitable nest hollows are only found in live trees with a diameter at breast height (DBH) of at least 500 mm. Usually this will be a natural hollow, but artificial hollows may also be suitable in some circumstances (for example, where the artificial hollow has been specifically designed for use by black cockatoos). Note that artificial hollows have only been shown to have value for Carnaby's Cockatoos to date. • **Potential breeding trees –** Trees that have a suitable DBH to develop a nest hollow but do not currently have hollows. For most species of trees, suitable nest hollows are only found

Habitat	Definition
	in live trees with a DBH of at least 500 mm. Trees suitable to develop a nest hollow in the future are 300-500 mm DBH. Note that many species of eucalypt may develop suitable hollows for breeding.

References

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Appendix D 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 E DAWE (2022) scoring tool

Starting score	Carnaby's Cockatoo
10	**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.**

Attribute	Subtractions	**Context adjustor** (attributes reducing functionally of foraging habitat)	Evidence from field survey
Foraging potential	-2	Subtract 2 from your score if there is no evidence of feeding debris on your site.	No evidence observed.
Connectivity	0	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	There are multiple patches of Eucalypt forest and woodland within 12 km of the survey area.
Proximity to breeding	-2	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.	The survey area is outside the breeding range for Carnaby's Cockatoo.
Proximity to roosting	0	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	0	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.	Disease was not observed during the field survey.
Total score			**6**
Appraisal	A total of 0.39 ha is considered to be Moderate quality for Carnaby's Cockatoo.		

Starting score	Baudins 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.

Attribute	Subtractions	**Context adjustor** (attributes reducing functionally of foraging habitat)	Evidence from field survey
Foraging potential	-2	Subtract 2 from your score if there is no evidence of feeding debris on your site.	No evidence observed.
Connectivity	0	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	There are multiple patches of Eucalypt forest and woodland within 12 km of the survey area.
Proximity to breeding	-2	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.	There is no direct evidence of breeding within 12 km for all 3 species, however there is breeding habitat present for Baudin's Cockatoo within the Phoenix (2025b) study area so undetected breeding cannot be discounted.
Proximity to roosting	0	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	There are known roosting sites within 20 km (DBCA 2023b) 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	0	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.	Disease was not observed during the field survey.
Total score			**8**
Appraisal	A total of 0.39 ha is considered to be High quality for Baudin's Cockatoo.		

Starting score	Forest Red-tailed Black Cockatoo
10	**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	Subtractions	**Context adjustor** (attributes reducing functionally of foraging habitat)	Evidence from field survey
Foraging potential	-2	Subtract 2 from your score if there is no evidence of feeding debris on your site.	No evidence observed.
Connectivity	0	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	There are multiple patches of Eucalypt forest and woodland within 12 km of the survey area.
Proximity to breeding	0	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.	There is no direct evidence of breeding within 12 km for all 3 species, however there were potential breeding trees for Forest Red-tailed Black Cockatoo recorded within the survey area so undetected breeding cannot be discounted.
Proximity to roosting	0	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	There are known roosting sites within 20 km (DBCA 2023b) 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	0	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.	Disease was not observed during the field survey.
Total score			**8**
Appraisal	A total of 0.2 ha is considered to be High quality for Forest Red-tailed Black Cockatoo.		

Appendix F Habitat Scoring System for Western Ringtail Possum (DCCEEW 2024)

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 G Flora likelihood of occurrence assessment

Taxon	EPBC Act	BC Act / DBCA	Source	Description	Habitat	Pre-survey	Justification	Post-survey	Justification
Reedia spathacea	CR	EN	Phoenix 2025a	Robust, tufted perennial, grass-like or herb (sedge), 2-4 m high, clumps 1.5-2 m wide. Fl. brown, Nov to Dec or Jan.	Peaty sand. Swamps, river edges.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (peaty sand in swamps and river edges) is present within the survey area.
Lambertia orbifolia subsp. vespera	EN	EN	Phoenix 2025a	Erect shrub or small tree up to 4 m high. Fl. Red. November to May.	Amongst Jarrah, Marri and Banksia woodland. In the Scott River plains is found on sandy ironstone soils or on grey sands over ironstone and winter wet areas.	Potential	Nearby records.	Unlikely	Suitable habitat may be present. However, is a conspicuous species and was not recorded.
Verticordia plumosa var. vassensis	EN	EN	Phoenix 2025a	Shrub, 0.3-1 m high. Fl. pink, Sep to Dec or Jan to Feb.	White/grey sand. Winter-wet flats.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (i.e., winter wet flats) is present within the survey area.
Banksia nivea subsp. uliginosa	EN	EN	Phoenix 2025a	Dense, erect, non-lignotuberous shrub, 0.2-1.5 m high. Fl. yellow-brown, Aug to Sep.	Sandy clay, gravel.	Potential	Nearby records.	Unlikely	Suitable habitat may be present. However, is a conspicuous species and was not recorded.
Boronia exilis	EN	EN	Phoenix 2025a	Erect, slender-stemmed perennial, herb, c. 1 m high, staminal filaments strongly ciliate. Fl. pink, Sep.	Seasonally wet heath.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (seasonally wet heath) is present within the survey area.

Taxon	EPBC Act	BC Act / DBCA	Source	Description	Habitat	Pre-survey	Justification	Post-survey	Justification
Darwinia ferricola	VU	EN	Phoenix 2025a	Densely-branched shrub, up to 1.5 m high. Fl. Green/greenish-red in spring months (Sep to Nov).	Scrubland in sand/clay over ironstone.	Potential	Nearby records.	Potential	Potential. No targeted survey undertaken during flowering time. Potentially suitable habitat identified within the survey area.
Grevillea brachystylis subsp. australis	VU	VU	Phoenix 2025a	Prostrate or erect, non-lignotuberous shrub, 0.1-2 m high. Fl. red, Sep to Dec or Jan.	Sand, sandy clay. Swampy situations, stream banks.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (i.e., swamps, stream banks) is present within the survey area.
Conospermum quadripetalum	-	CR	Phoenix 2025a	Diffuse, straggly shrub, 0.3-1 m high. Fl. blue/white, Sep to Nov.	Sandy clay, grey sand. Flats behind coastal hills.	Potential	Nearby records.	Potential	Potential. No targeted survey undertaken during flowering time. Potentially suitable habitat identified within the survey area.
Andersonia ferricola	-	P1	Phoenix 2025a	Shrub, 0.2-0.5 m high. Fl. purple, Oct.	White sand or red-brown loam over ironstone. Seasonally wet flats.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (seasonally wet flats) is present within the survey area.
Hemigenia obovata	-	P1	Phoenix 2025a	Erect shrub, to 0.5 m high. Fl. blue-purple, Oct to Nov.	White or black wet sand. Flats.	Potential	Nearby records.	Potential	Potential. No targeted survey undertaken during flowering time. Potentially suitable habitat identified within the survey area.

Taxon	EPBC Act	BC Act / DBCA	Source	Description	Habitat	Pre-survey	Justification	Post-survey	Justification
Pericalymma megaphyllum	-	P1	Phoenix 2025a	Erect shrub, to 0.35 m high. Fl. white-pink, Nov.	Red-brown lateritic clayey sand. Elevated washed areas.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (red-brown lateritic clayey sand) is present within the survey area.
Philydrella pygmaea subsp. minima	-	P1	Phoenix 2025a	Bulbaceous, perennial, herb, 0.02-0.2 m high. Fl. yellow, Aug to Nov.	Damp sites.	Potential	Nearby records.	Potential	No targeted survey undertaken during flowering time. Potentially suitable habitat identified within the survey area.
Schoenus indutus	-	P1	Phoenix 2025a	Perennial, grass-like or herb (sedge), 0.6 m high. Fl. brown, Oct.	Gravelly sand.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (gravelly sand) is present within the survey area.
Stylidium sp. Scott River Plain (N.G. Marchant 74/23)	-	P1	Phoenix 2025a	No description available.	No habitat description available.	Potential	Nearby records.	Potential	No habitat description provided; therefore potentially suitable habitat could be present.
Synaphea macrophylla	-	P1	Phoenix 2025a	Decumbent shrub. Fl. yellow, Oct.	Gravelly loam.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (gravelly loam) is present within the survey area.
Thysanotus formosus	-	P1	Phoenix 2025a	Caespitose perennial, herb, to 0.3 m high. Fl. purple, Nov to Dec or Jan.	Clayey sand, sandy loam. In situations often inundated in winter.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (seasonally inundated areas)

Taxon	EPBC Act	BC Act / DBCA	Source	Description	Habitat	Pre-survey	Justification	Post-survey	Justification
									is present within the survey area.
Synaphea nexosa	-	P1	Phoenix 2025a	Densely tangled shrub, to 1 m high. Fl. yellow, Oct to Nov.	Clay-loam. Winter-wet flats.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (i.e., winter wet flats) is present within the survey area.
Diuris heberlei	-	P2	Phoenix 2025a	Tuberous, perennial, herb, 0.2-0.5 m high. Fl. yellow, Dec or Jan to Feb.	Grows in sandy-clay and peaty soils in seasonally damp coastal flats.	Potential	Nearby records.	Unlikely	Suitable habitat (i.e., sandy-clay or peaty soils in seasonally damp areas) is not present within the survey area.
Hemigenia sp. Nillup (R.D. Royce 98)	-	P2	Phoenix 2025a	Perennial shrub to 50cm high. Flowering in November to January.	*Eucalyptus marginata* woodlands over *Xanthorrhoea preissii* shrublands over sedgelands.	Potential	Nearby records.	Potential	No targeted survey undertaken during flowering time. Potentially suitable habitat identified within the survey area.
Lepyrodia extensa	-	P2	Phoenix 2025a	Herb (sedge-like), approx. 0.3m high.	Sand & Sandy peat. Seasonally inundated swamps.	Potential	Nearby records.	Unlikely	Suitable habitat (i.e., sand & sandy peat in seasonally inundated swamps) not recorded in survey area.
Leucopogon incisus	-	P2	Phoenix 2025a	Delicate, erect shrub to 40cm high, single-stemmed at ground level. Narrowly ovate or elliptic leaves with recurved margins,	Known from a small area in the far south of the Jarrah Forest bioregion, where it is growing in open Jarrah woodland on a winter-damp sandy flat. Associated	Potential	Nearby records.	Potential	Potentially suitable habitat (i.e. winter-damp, sandy flat Jarrah forest) present in the survey area.

Taxon	EPBC Act	BC Act / DBCA	Source	Description	Habitat	Pre-survey	Justification	Post-survey	Justification
				glabrous branchlets, corolla tube longer than the sepals and strongly compressed fruit with a distinct apical notch (WAH 2015).	species include Anarthria prolifera, Kingia australis, Sphenotoma gracilis and Hypericoides (WAH 2015)				
Machaerina ascendens	-	P2	Phoenix 2025a	Scarmbling or sprawling perennial forming dense clumps through shrubs (Barrett & Wilson 2022)	Water to waterlogged soils toward the edge of swamps that are waterlogged and boggy for most or all of the year in peaty, sandy, or clay soils (Barrett & Wilson 2022)	Potential	Nearby records.	Unlikely	No potentially suitable habitat is present in the survey area.
Pigea volubilis	-	P2	Phoenix 2025a	Twining perennial, herb, 0.3-1(-4) m high. Fl. blue-purple-white, Sep to Dec.	Clay or sandy clay. River banks.	Potential	Nearby records.	Unlikely	No potentially suitable habitat is present in the survey area.
Schoenus loliaceus	-	P2	Phoenix 2025a	Annual, grass-like or herb (sedge) 0.03 - 0.06m high. Fl Aug to Nov.	Sandy soils, winter-wet depressions.	Potential	Nearby records.	Unlikely	No potentially suitable habitat is present in the survey area.
Stenanthemum sublineare	-	P2	Phoenix 2025a	Erect shrub, to 0.1 m high. Fl. green, Oct to Dec.	Recorded in littered white sand, in a woodland dominated by Banksia attenatta on the coastal plain.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (i.e. Banksia-dominated woodlands) within the survey area.
Styphelia intricata	-	P2	Phoenix 2025a	Tangled, spreading shrub to 80cm high, single-stemmed at ground level. Distinguished by leaves linear to narrowly oate, margins strongly recuved. 1 or 2-flowered	Restricted distribution in far south-west of Jarrah Forest and far west of Warren bioregions. Occurs in seasonal wetlands in open woodland or heath, associated with Melaleuca preissiana, Taxandria spp.,	Potential	Nearby records.	Unlikely	No potentially suitable habitat (i.e., seasonal wetlands in open woodland or heaths) is present within the survey area.

Taxon	EPBC Act	BC Act / DBCA	Source	Description	Habitat	Pre-survey	Justification	Post-survey	Justification
				sepals glabrous, acute, often mucronate. Flowers Apr - June, mature fruit Oct - Nov.	Beaufortia sparsa, Aotus intermedia.				
Boronia anceps	-	P3	Phoenix 2025a	Perennial, herb, 0.3-0.6 m high, lacking lignotuber, stem flattened and ancipitous when young. Fl. pink/pink-purple, Sep to Dec or Jan.	White sand, gravelly laterite. Seasonally swampy heaths.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (seasonally swampy heaths) is present within the survey area
Calothamnus lateralis var. crassus	-	P3	Phoenix 2025a	Shrub 1 - 2 m tall, without lignotuber. Fl August to October or January or June.	Winter-wet flats, riverbanks, wet depressions, swamps. Clayey peaty sands, often amongst Agonis flexuosa, Hakea spp., Restionaceae spp.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (clayey peaty sands and wet areas) is present within the survey area.
Chorizema carinatum	-	P3	Phoenix 2025a	Erect or spreading shrub, 0.1-0.6 m high. Fl. yellow, Oct to Dec.	Sand, sandy clay.	Potential	Nearby records.	Potential	No targeted survey undertaken during flowering time. Potentially suitable habitat within the survey area.
Dampiera heteroptera	-	P3	Phoenix 2025a	Erect to semi-prostrate perennial, herb or shrub, 0.3-0.6 m high. Fl. blue, Sep to Oct.	Sandy soils. Swampy areas.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (swampy areas) is present within the survey area.
Gastrolobium formosum	-	P3	Phoenix 2025a	Small, trailing shrub, to 1 m high. Fl. red, Nov.	Clay loam. Along river banks or in swamps.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (clay loam soils,

Taxon	EPBC Act	BC Act / DBCA	Source	Description	Habitat	Pre-survey	Justification	Post-survey	Justification
									river banks and swamps) is present within the survey area.
Grevillea manglesioides subsp. ferricola	-	P3	Phoenix 2025a	Erect or spreading shrub, 1.5 m high. Fl. red/green/red&green, Oct.	Red sandy clay over ironstone. Winter wet flats.	Potential	Nearby records.	Unlikely	No potentially suitable habitat and is a conspicuous species.
Grevillea papillosa	-	P3	Phoenix 2025a	Spreading shrub, 0.3-1.2 m high. Fl. white/yellow & red, Apr or Sep to Oct.	Brown or peaty sand, sandy clay, loam. Seasonally-wet areas, swamps.	Potential	Nearby records.	Unlikely	No potentially suitable habitat and is a conspicuous species.
Isopogon formosus subsp. dasylepis	-	P3	Phoenix 2025a	Low, bushy or slender, upright, non-lignotuberous shrub, 0.2-2 m high. Fl. pink-purple/red, Jun to Dec.	Sand, sandy clay, gravelly sandy soils over laterite. Often swampy areas.	Potential	Nearby records.	Unlikely	Suitable habitat may present. However, was not recorded despite survey being undertaken during flowering time and conspicuous nature.
Leucopogon alternifolius	-	P3	Phoenix 2025a	Erect or semi-erect, scrambling shrub, 0.1-1(-2) m high. Fl. white/white-pink Aug to Dec.	Grey/white sand. Swampy areas, seasonally wet areas.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (seasonally wet and swampy areas) is present within the survey area.
Loxocarya magna	-	P3	Phoenix 2025a	Rhizomatous, perennial, herb (sedge-like), 0.5-1.5 m high. Fl. Sep or Nov.	Sand, loam, clay, ironstone. Seasonally inundated or damp habitats.	Potential	Nearby records.	Unlikely	Suitable habitat may be present in damp areas. However, is a conspicuous

Taxon	EPBC Act	BC Act / DBCA	Source	Description	Habitat	Pre-survey	Justification	Post-survey	Justification
									species and was not recorded.
Netrostylis sp. Blackwood River (A.R. Annels 3043)	-	P3	Phoenix 2025a	Sprawling sedge 30 cm–1.7 m high x 50 cm wide. (Phoenix 2025x). Fl Nov.	Drainage lines, creek beds.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (drainage lines, creek beds) is present within the survey area.
Acacia inops	-	P3	Phoenix 2025a	Weak, scrambling, pungent shrub, 0.4-1.1 m high. Fl. white-cream, Sep to Nov.	Black peaty sand, clay. Swamps, creeks.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (i.e., black peaty sand, swamps, creeks) is present within the survey area.
Acacia lateriticola glabrous variant (B.R. Maslin 6765)	-	P3	Phoenix 2025a	Shrub, 0.4-0.8 m high. Fl. yellow, Aug or Oct.	Lateritic sand in Jarrah and Marri forest and woodland	Potential	Nearby records.	Potential	Potentially suitable habitat (Jarrah-Marri forest and woodland on sand)
Andersonia sp. Amabile (N. Gibson & M. Lyons 355)	-	P3	Phoenix 2025a	Compact shrub, 0.08-0.3 m high. Fl. pink, Oct to Dec.	Grey or black peaty sand, loam. Creek banks, swamp edges, seasonally wet flats	Potential	Nearby records.	Unlikely	No potentially suitable habitat (i.e., black peaty sand, swamps, creeks) is present within the survey area.
Blennospora doliiformis	-	P3	Phoenix 2025a	Erect annual, herb, to 0.15 m high. Fl. yellow, Oct to Nov.	Grey or red clay soils over ironstone. Seasonally-wet flats.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (i.e. grey or red clay soils over ironstone, seasonally-wet flats) is present in the survey area.

Taxon	EPBC Act	BC Act / DBCA	Source	Description	Habitat	Pre-survey	Justification	Post-survey	Justification
Caladenia abbreviata	-	P3	Phoenix 2025a	Tuberous, perennial, herb, 0.2-0.35 m high. Fl. yellow & brown, Nov to Dec.	Deep sandy soils in coastal woodlands and shrublands.	Potential	Nearby records.	Unlikely	
Chordifex gracilior	-	P3	Phoenix 2025a	Rhizomatous, erect perennial, herb, 0.3-0.5 m high. Fl. brown, Sep to Dec.	Peaty sand. Swamps.	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. Peaty sand, swamps) not present in survey area
Chordifex jacksonii	-	P3	Phoenix 2025a	Rhizomatous, erect perennial, herb, 0.4-1 m high. Sand, loamy sand.	Seasonally inundated swamps	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. seasonally inundated swamps) not present in the survey area.
Cyathochaeta stipoides	-	P3	Phoenix 2025a	Rhizomatous, caespitose perennial, grass-like or herb (sedge), (0.25-)0.35-1 m high. Fl. red-brown, Oct to Dec or Jan.	Grey or red-brown sand. Seasonally wet flats. Low heathy sedgelands	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. seasonally wet flats) not present in the survey area.
Cyathochaeta teretifolia	-	P3	Phoenix 2025a	Rhizomatous, clumped, robust perennial, grass-like or herb (sedge), to 2 m high, to 1.0 m wide. Fl. brown.	Grey sand, sandy clay. Swamps, creek edges.	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. swamps and creek edges) not present in the survey area.
Lepyrodia heleocharoides	-	P3	Phoenix 2025a	Rhizomatous, slender, tufted perennial, herb (sedge-like), 0.15-0.25 m high. Fl. Dec.	Moist peaty sand. Dry or seasonally inundated heath or woodland, swamps. Moist sedge-heath.	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. moist peaty sand) not present in the survey area.
Leucopogon wheelerae	-	P3	Phoenix 2025a	Sprawling shrub to 80cm. Erect white	Restricted to heath or woodland edge on	Potential	Nearby records.	Unlikely	Potentially suitable habitat

Taxon	EPBC Act	BC Act / DBCA	Source	Description	Habitat	Pre-survey	Justification	Post-survey	Justification
				inflorescence,fl. Aug - Oct. (WAH 2008)	seasonally wet flats (WAH 2008).				(i.e. seasonally wet flats) not present in the survey area.
Stylidium trudgenii	-	P3	Phoenix 2025a	Caespitose perennial, herb, 0.05-0.5 m high.	Grey sand, dark grey to black sandy peat. Margins of winter-wet swamps, depressions.	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. winter-wet swamps and depressions) not present in the survey area.
Synaphea otiostigma	-	P3	Phoenix 2025a	Decumbent to erect small shrub. Fl. yellow, Oct to Nov.	Clayey laterite, gravelly loam, sand.	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. clayey laterite) not present in the survey area.
Synaphea petiolaris subsp. simplex	-	P3	Phoenix 2025a	Tufted shrub, 0.1-0.6 m high. Fl. yellow, Sep to Oct.	Sandy soils. Flats, winter-wet areas.	Potential	Nearby records.	Potential	No targeted survey undertaken during flowering time. Potentially suitable habitat identified within the survey area.
Tricostularia davisii	-	P3	Phoenix 2025a	Perennial tufted herb, 0.1 - 0.6m tall. Dense tussocks 0.15-0.7m across. Tufting habit, thin, one or two nodes culms and small. (Barrett et al. 2021)	Mallee woodland and heath on flats, hillsides and valleys in a variety of soils including grey sand, brown sandy clay, swampy peaty sand over clay, lateritic loam, granite, spongelite and soapstone. Often in damp or winter-wet areas (Barrett et al. 2021).	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e mallee woodland) not present in the survey area.

Taxon	EPBC Act	BC Act / DBCA	Source	Description	Habitat	Pre-survey	Justification	Post-survey	Justification
Adenanthos x pamela	-	P4	Phoenix 2025a	Erect, lignotuberous shrub, 0.75-1.7 m high. Fl. orange/red, May or Oct to Dec.	Grey sand, laterite. Damp flats, roadsides.	Potential	Nearby records.	Unlikely	Suitable habitat may be present. However, is a conspicuous species and was not recorded.
Aotus carinata	-	P4	Phoenix 2025a	Erect, slender shrub, 0.6-1.5 m high. Fl. orange/yellow & red, Sep to Nov.	Sandy soils. Seasonally wet flats.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (seasonally wet flats) is present within the survey area.
Adenanthos detmoldii	-	P4	Phoenix 2025a	Erect, diffuse, lignotuberous shrub, 0.9-4 m high. Fl. yellow-orange, Jan or Apr or Jun or Aug to Dec.	Grey or black peaty sand, wet. Swamps, roadsides.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (peaty sand) is present within the survey area.
Melaleuca basicephala	-	P4	Phoenix 2025a	Straggly shrub, 0.3-0.9 m high. Fl. pink-purple, Dec or Jan.	Black peaty sand, clay. Winter-wet flats, swamps.	Potential	Nearby records.	Unlikely	No potentially suitable habitat (black peaty sand in winter-wet flats or swamps) is present within the survey area.
Acacia tayloriana	-	P4	Phoenix 2025a	Prostrate shrub. Fl. cream-white, Jan.	Grey or yellow/orange sandy soils, lateritic gravel, clay loam. Winter-wet areas.	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. winter wet areas) not present in the survey area.
Astartea onycis	-	P4	Phoenix 2025a	Shrub 0.2-1.2m tall, spindly, over very slender but up to 1m wide. Flowers 4-7mm diameter, white or pale	Pale grey sand or sandy clay over clay in seasonally wet sedgelands, mainly on plaints not far from the coast such as Scott River plain. Associated species	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. seasonally wet sedgelands) not present in the survey area.

Taxon	EPBC Act	BC Act / DBCA	Source	Description	Habitat	Pre-survey	Justification	Post-survey	Justification
				pink in Summer (WAH 2021)	include other myrtaceous species associated with wetlands such as species of *Taxandria*.				
Calothamnus quadrifidus subsp. teretifolius	-	P4	Phoenix 2025a	Shrub to 5m tall, stems glabrous leaves terete 15-35mm long.Fl. Sep - Dec. (WAH 2010)	Clay with ironstone, wet in winter, tall shrubland (WAH 2010)	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. clay with ironstone) not present in the survey area.
Drosera fimbriata	-	P4	Phoenix 2025a	Erect tuberous, perennial, herb, 0.05-0.15 m high. Fl. white, Sep to Oct.	White sand, granite.	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. granite) not present in the survey area.
Gonocarpus pusillus	-	P4	Phoenix 2025a	Prostrate annual, herb, 0.05-1.2 m high. Fl. green/yellow-red, Nov to Dec.	Grey sandy clay. Winter-wet swamps	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. winter wet swamps) not present in the survey area.
Gonocarpus simplex	-	P4	Phoenix 2025a	Tufted perennial, herb, 0.2-0.6 m high. Fl. green/red-brown, Nov to Dec.	Peaty sand. Swamps, seasonally inundated areas.	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. peaty sand and swamps) not present in the survey area.
Myriophyllum trifidum	-	P4	Phoenix 2025a	Decumbent annual semi-aquatic herb.	Grey sandy clay depressions in winter-wet flats where it grows in very low heath of tea tree and twine rushes.	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. depressions in low heath of tea tree) not present in the survey area.
Stylidium leeuwinense	-	P4	Phoenix 2025a	Perennial herb . Flowers sessile, silvery white.	Black sandy soil on swampy heathland (WAH 1997)	Potential	Nearby records.	Unlikely	Potentially suitable habitat

Taxon	EPBC Act	BC Act / DBCA	Source	Description	Habitat	Pre-survey	Justification	Post-survey	Justification
				Corolla reddish purple. Fl. Feb - May. (WAH 1997)					(i.e. black sandy soil on swampy heathland) not present in the survey area.
Tripterococcus sp. *Brachylobus (A.S. George 14234)*	-	P4	Phoenix 2025a	Perennial, herb, to 1 m high. Fl. yellow-green, Oct to Nov.	Grey, black or peaty sand. Winter-wet flats.	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. winter-wet flats) not present in the survey area.
Verticordia lehmannii	-	P4	Phoenix 2025a	Slender shrub, 0.2-1 m high. Fl. pink, Jan or Apr to Jun or Aug or Dec.	Sandy clay. Winter-wet flats	Potential	Nearby records.	Unlikely	Potentially suitable habitat (i.e. winter-wet flats) not present in the survey area.

Appendix H Fauna likelihood of occurrence assessment

Taxon	Common name	Conservation status		Source	Habitat	Likelihood of occurrence assessment			
		EPBC Act	BC Act / DBCA			Pre-survey	Justification	Post-survey	Justification
Pseudocheirus occidentalis	Western Ringtail Possum	CR	CR	Phoenix 2025b	Preferred habitat for this species includes Peppermint forests, woodlands, and Eucalyptus forests, usually with a Peppermint understorey, where the species feeds exclusively in the dominant or co-dominant upper and mid-storey (DPaW 2017).	Potential	Nearby records and suitable habitat present.	Potential	Moderate value habitat present in survey area. Recent nearby records. Habitat patch is isolated from other areas of high value habitat, limiting the ability for individuals to move freely throughout the landscape.
Calidris ferruginea	Curlew Sandpiper	CR/MI	CR	Phoenix 2025b	Widespread throughout Australia, both along coastlines and inland (DoE 2015). Abundant on intertidal mudflats, sheltered coastal areas and non-tidal wetlands. Foraging occurs on mudflats and in shallow water nearby. Does not breed in Australia. Breeding occurs in the Russian Arctic.	Potential	Nearby records.	Unlikely	Suitable habitat not recorded.
Zanda baudinii	Baudin's Cockatoo	EN	EN	Phoenix 2025b	The Baudin's Cockatoo typically inhabits the temperate forests and woodlands of the southwest of Western Australia that are dominated by Jarrah, Marri and Karri (Johnstone et al. 2010). Generally, night roosting habitat occurs in or near riparian environments or other permanent water sources, comprising tall trees, but particularly Jarrah, Flooded Gum, Blackbutt, Tuart and introduced eucalypts such as Blue Gum and Lemon Scented Gum (DAWE 2022).	Potential	Nearby records and suitable habitat present.	Likely	High value habitat present in survey area. Recent nearby records.

Taxon	Common name	Conservation status		Source	Habitat	Likelihood of occurrence assessment			
		EPBC Act	BC Act / DBCA			Pre-survey	Justification	Post-survey	Justification
Zanda latirostris	Carnaby's Cockatoo	EN	EN	Phoenix 2025b	Carnaby's Cockatoo utilises a variety of forests, shrublands and Banksia woodlands. The species uses native shrubland, kwongan heathland and proteaceous woodland, including Banksia woodland for foraging, where it feeds on mainly the seeds and less often the nectar of Eucalyptus spp., Banksia spp., Hakea spp. and Pinus spp. (DCCEEW 2023). Roosting habitat occurs in or near riparian environments or natural and artificial permanent water sources and comprises any tall trees, but particularly Flat-topped Yate, Salmon Gum, Wandoo, Marri, Karri, Blackbutt, Tuart, and introduced Eucalypts and Pines (DAWE 2022). Breeding generally occurs in remnant patches of woodland, forests and individual trees, typically consisting of Eucalypt species such as Wandoo, Tuart, Jarrah, York Gum, Salmon Gum, Flooded Gum, Powderbark, Karri and Marri.	Potential	Nearby records and suitable habitat present.	Likely	High value habitat present in survey area. Recent nearby records.
Botaurus poiciloptilus	Australasian Bittern	EN	EN	Phoenix 2025b	This species typically inhabits freshwater wetlands, and to a lesser extent estuaries or tidal wetlands (Marchant and Higgins 1990). Habitat preferences comprises permanent and seasonal freshwater wetlands with dense vegetation, particularly those dominated by sedges, rushes and/or reeds or cutting grass (Gahnia) growing over a muddy or peaty substrate, as well as rice crops (Marchant and Higgins 1990).	Potential	Nearby records.	Unlikely	Suitable habitat (wetlands) not recorded.
Tringa nebularia	Common Greenshank	EN/MI	MI	Phoenix 2025b	This species occurs in wetlands throughout Australia (DCCEEW 2023[). Prefers coastal or inland wetlands, in estuaries and mudflats, mangrove swamps and lagoons. Foraging habitat includes mudflats, channels, or the edges of mangroves, sedges and saltmarsh. Breeding occurs in the Palaearctic; it does not breed in Australia.	Potential	Nearby records.	Unlikely	Suitable habitat (wetlands) not recorded.

Taxon	Common name	Conservation status		Source	Habitat	Likelihood of occurrence assessment			
		EPBC Act	BC Act / DBCA			Pre-survey	Justification	Post-survey	Justification
Dasyurus geoffroii	Chuditch	VU	VU	Phoenix 2025b	This species is known to occur in Jarrah forests and woodlands in the southwest of Western Australia. They are also found in woodlands, mallee shrublands, and heath areas along the south coast. Adequate den resources are crucial for Chuditch, such as hollow logs, burrows, or rock crevices. The species benefits from control of the Red Fox. Riparian Jarrah forests have been found to support the densest populations.	Potential	Nearby records and suitable habitat present.	Potential	Suitable habitat present in survey area. Recent nearby records.
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	Phoenix 2025b	This species roosts in dense forests comprised of most tall trees, but particularly Jarrah, Marri, Blackbutt, Tuart and introduced Eucalypt trees, that on average receive more than 600 mm of annual rainfall (DAWE 2022; Saunders and Ingram 1995). These dense forests are also utilised for foraging, where in small family groups leave the roost at sunrise to feed (Johnstone and Kirkby 1999). It almost exclusively feeds on seeds from Marri and Jarrah, and to a lesser extent Blackbutt, Albany Blackbutt, Forest Sheoak and Snottygobble (Johnstone and Storr 1998; Johnstone and Kirkby 1999). The species is known to nest in the deep hollows of Marri, Wandoo, Blackbutt and Bullich (Johnstone et al. 2013).	Potential	Nearby records and suitable habitat present.	Likely	High value habitat present in survey area. Recent nearby records.
Calidris acuminata	Sharp-tailed Sandpiper	VU/MI	MI	Phoenix 2025b	Records are distributed throughout Australia, mostly to the south-east (DCCEEW 2023). In Western Australia, species records are widespread. The species inhabits several habitats, including saline inland wetlands, damp grasslands, and tidal flats. Forging occurs in wetlands or intertidal mudflats, and the vegetation of saltmarsh, grass or sedges. Spends the non-breeding season in Australia, with breeding occurring in Siberia.	Potential	Nearby records.	Unlikely	Suitable habitat (wetlands) not recorded.

Taxon	Common name	Conservation status		Source	Habitat	Likelihood of occurrence assessment			
		EPBC Act	BC Act / DBCA			Pre-survey	Justification	Post-survey	Justification
Tringa glareola	Wood Sandpiper	MI	MI	Phoenix 2025b	Recorded in largest numbers in north Western Australia, although also distributed throughout Queensland, Vitoria, New South Wales and South Australia (DCCEEW 2023). The species occurrence in Western Australia is widespread but scattered. Typically inhabits shallow freshwater wetlands well-vegetated with emergent reeds and grass, surrounded by tall plants and dead trees. Foraging occurs in wet or dry mud at the edges of wetlands (Higgins and Davies 1996). Does not breed in Australia, with breeding occurring throughout Eurasia.	Potential	Nearby records.	Unlikely	Suitable habitat (wetlands) not recorded.
Calidris melanotos	Pectoral Sandpiper	MI	MI	Phoenix 2025b	Distributed throughout Australia, although rarely recorded in Western Australia (DCCEEW 2023). In Australia, the species preferred habitat is shallow, fresh to saline wetlands. The species also inhabits grassy edges of shores and tidal marshes, muddy shores. Does not breed in Australia, with breeding occurring in Russia and North America.	Potential	Nearby records.	Unlikely	Suitable habitat (wetlands) not recorded.
Pandion haliaetus	Osprey	MI	MI	Phoenix 2025b	The species is distributed along Australia's northern coastline, from south-west Western Australia to south-east New South Wales (DCCEEW 2023). Habitat includes coastal habitat and terrestrial wetlands of tropical and temperate Australia and offshore islands. Foraging requires the presence of extensive areas of saline, brackish or fresh water. Breeding in Australia occurs from Albany in Western Australia's south and around the northern coastline to southern New South Wales	Potential	Nearby records.	Unlikely	Suitable habitat (wetlands) not recorded.
Pluvialis fulva	Pacific Golden Plover	MI	MI	Phoenix 2025b	Inhabits coastal habitats like beaches, mudflats and sandflats. Less often recorded in terrestrial habitats, usually wetlands (DCCEEW 2023). Does not breed in Australia. Breeding occurs in northern Siberia, between the Yamal Peninsula, Chukotski Peninsula, and the Gulf of Anadyr.	Potential	Nearby records.	Unlikely	Suitable habitat (wetlands) not recorded.

Taxon	Common name	Conservation status		Source	Habitat	Likelihood of occurrence assessment			
		EPBC Act	BC Act / DBCA			Pre-survey	Justification	Post-survey	Justification
Tringa stagnatilis	Marsh Sandpiper	MI	MI	Phoenix 2025b	Lives in permanent or ephemeral wetlands of varying salinity (DCCEEW 2023). In Western Australia they prefer freshwater to marine environments. Does not breed in Australia. Breeding occurs in east Europe, southern Siberia and northern China.	Potential	Nearby records.	Unlikely	Suitable habitat (wetlands) not recorded.
Actitis hypoleucos	Common Sandpiper	MI	MI	Phoenix 2025b	Occurs along all Australian coastlines and throughout many inland areas (DCCEEW 2023). Typically found on coastal and inland wetland habitat, mostly on rocky shores and muddy margins. Foraging habitat includes the edges of wetlands, in shallow water and soft mud. Roosting occurs on rocks, roots and vegetation branches, such as mangroves. It does not breed in Australia; the population that migrates to Australia breeds in far east Russia.	Potential	Nearby records.	Unlikely	Suitable habitat (wetlands) not recorded.
Apus pacificus	Fork-tailed Swift	MI	MI	Phoenix 2025b	Recorded in all states and territories of Australia (DCCEEW 2023). In Western Australia, the species has been recorded along most of the coastline. The species is almost exclusively aerial, mostly occurring over inland plains. It is a non-breeding visitor to Australia, with breeding occurring in Siberia.	Potential	Nearby records.	Unlikely	Suitable habitat not recorded.
Calidris ruficollis	Red-necked Stint	MI	MI	Phoenix 2025b	Distributed along the majority of Australia's coastline, with most abundant records on the coast of Tasmania and Victoria (DCCEEW 2023). Most abundant on tidal flats, also occurs on brackish and fresh inland wetlands. Foraging habitat includes intertidal mudflats or sandflats, and in very shallow water. Foraging may occur in non-tidal wetlands during high tide. Does not breed in Australia, with breeding occurring in Alaska and Siberia.	Potential	Nearby records.	Unlikely	Suitable habitat (wetlands) not recorded.
Phascogale tapoatafa wambenger	South-western Brush-tailed Phascogale	-	CD	Phoenix 2025b	This species has been observed in dry sclerophyll forest and open woodlands with hollow-bearing trees (DEC 2012).	Potential	Nearby records and suitable habitat present.	Potential	Suitable habitat present in survey area. Recent nearby records.

Taxon	Common name	Conservation status		Source	Habitat	Likelihood of occurrence assessment			
		EPBC Act	BC Act / DBCA			Pre-survey	Justification	Post-survey	Justification
Falco peregrinus	Peregrine Falcon	-	OS	Phoenix 2025b	This species occurs in most habitats, from the arid zone to rainforests (Birdlife Australia 2023[212]). The Peregrine Falcon prefers open woodlands near water, or coastal and inland cliffs. It is widespread, and hunts over rainforests, estuaries and offshore island seabird colonies.	Potential	Nearby records and suitable habitat present.	Potential	Suitable habitat present in survey area. Recent nearby records.
Tyto novaehollandiae novaehollandiae	Masked Owl (southwest)	-	P3	Phoenix 2025b	This species roosts and nests in heavy forest; hunts over open woodland and farmland (Morcombe and Stewart 2021)	Potential	Nearby records and suitable habitat present.	Potential	Suitable habitat present in survey area. Recent nearby records.
Falsistrellus mackenziei	Western False Pipistrelle	-	P4	Phoenix 2025b	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.	Potential	Nearby records and suitable habitat present.	Potential	Suitable habitat present in survey area. Recent nearby records.
Isoodon fusciventer	Quenda	-	P4	Phoenix 2025b	This species typically occurs in dense shrubland and in understorey of adjacent forest. The distribution around Perth is commonly associated with wetlands and woodlands.	Potential	Nearby records and suitable habitat present.	Potential	Suitable habitat present in survey area. Recent nearby records.
Elapognathus minor	Short-nosed Snake	-	P2	Phoenix 2025b	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).	Potential	Nearby records.	Unlikely	Suitable habitat not recorded.
Oxyura australis	Blue-billed Duck	-	P4	Phoenix 2025b	This is species is almost entirely aquatic, favouring deep water, and is rarely seen on land (Birdlife Australia 2023).	Potential	Nearby records.	Unlikely	Suitable habitat (wetlands) not recorded.
Notamacropus irma	Western Brush Wallaby	-	P4	Phoenix 2025b	This species is found in some areas of mallee, Banksia woodland and heathland, including dense kwongan. It is also found in tall, open forests that have good grazing areas but some thickets, presumably for shelter (ALA 2023). It is uncommon in wet sclerophyll forest or Karri forest with thick undergrowth.	Potential	Nearby records.	Unlikely	Suitable habitat not recorded.

Appendix I Ecological community likelihood of occurrence assessment

Community Name	Description	Conservation status		Source	Likelihood of occurrence assessment			
		EPBC Act	BC Act / DBCA		Pre-survey	Justification	Post-survey	Justification
Scott River Ironstone Association	The community occurs in a winter-wet habitat on red clay to clay-loam often over massive ironstone on the Scott Coastal Plain. It mainly comprises heaths, shrublands and thickets and is variously dominated by *Melaleuca preissiana* (moonah), *Hakea tuberculata, Kunzea micrantha* or *Melaleuca incana subsp*. Gingilup (P2), depending on the degree of waterlogging. The understorey is generally dominated by *Loxocarya magna* (P3). Most occurrences have very diverse annual flora of *Stylidium* spp. (trigger plants), *Centrolepis* spp., Schoenus spp., Aphelia spp. and other herbs. The community also contains a number of endemic and restricted taxa such as *Darwinia ferricola* (Endangered), *Grevillea manglesioides* subsp. *ferricola* (P3), *Lambertia orbifolia* subsp. Scott River Plains (Endangered) and *Melaleuca incana* subsp. *Gingilup* (P2) (DBCA 2023a). To be considered part of the community, the vegetation must meet the condition of Good or above.	EN	CR	Phoenix 2025a	Potential	Nearby records.	Not recorded	The key diagnostic characteristics of the Scott River Ironstone Association include the presence of a 'shrubland or heathland with an open to closed structure' dominated by *Melaleuca preissiana*, *Hakea tuberculata*, *Kunzea micrantha*, or *Melaleuca incana* subsp. Gingilup (N. Gibson & M. Lyons 593) over an understorey of generally *Loxocarya magna*. The two vegetation types recorded in the survey area do not meet this description and as such, the Scott River Ironstone Association was not recorded within the survey area during the assessment.
Empodisma peatlands of southwestern Australia	The Empodisma peatlands of southwestern Australia is the assemblage of native plants, animals and other organisms that comprise a type of seasonally waterlogged freshwater, peat-based wetland. The ecological community predominantly occurs in the Warren Bioregion and the Southern Jarrah Forest subregion of the Jarrah Forest Bioregion. Some occurrences may also occur in high rainfall areas of the Fitzgerald, Northern Jarrah Forest and Perth subregions where climatic, stratigraphic and topographic conditions are suitable for Empodisma peatlands to form. The structure of the ecological community is typically a sedgeland to shrubland vegetation complex on peaty substrates. The undisturbed ground layer of the	EN	-	Phoenix 2025a	Unlikely	Unlikely to be suitable habitat present.	Not recorded	The vegetation community (i.e., a sedgeland to shrubland vegetation complex on peaty substrates dominated by *Empodisma gracillimum*) was not recorded within the survey area during the assessment.

Community Name	Description	Conservation status		Source	Likelihood of occurrence assessment			
		EPBC Act	BC Act / DBCA		Pre-survey	Justification	Post-survey	Justification
	ecological community is often dense and typically comprises a suite of native wetland graminoid and forb species. The ground layer is almost always characterised by the perennial restiad grass-like twig rush Empodisma gracillimum (tanglefoot). Co-dominant or otherwise often occurring Cyperaceae and Restionaceae species include: *Gahnia decomposita*, *Gymnoschoenus anceps*, *Lepidosperma striatum*, *Leptocarpus tenax* (slender twine rush), *Machaerina rubiginosa* (soft twig rush), *Schoenus multiglumis, Sporadanthus rivularis and Reedia spathacea* (reedia). Small trees/woody shrubs within the Empodisma peatlands vary from dense to sparse and may include *Acacia hastulata, Acidonia macrocarpa, Aotus intermedia, Boronia stricta, Callistemon glaucus* (Albany bottlebrush), *Cosmelia rubra* (spindle heath), *Dampiera leptoclada* (slender-shooted dampiera), *Homalospermum firmum, Sphaerolobium fornicatum*, *Taxandria fragrans, T. linearifolia* and *Tetratheca filiformis*. Trees vary from sparse to absent within the ecological community but may include *Eucalyptus megacarpa* (blue gum of Western Australia, Bullich), *Melaleuca preissiana* (moonah, modong) and *Taxandria juniperina* (watti, native cedar) as emergents or on the edge of the ecological community (DCCEEW 2023).							
Subtropical and Temperate Coastal Saltmarsh (analogous with the Subtropical and Temperate Coastal Saltmarsh EPBC-listed TEC)	Consists of the assemblage of plants, animals and micro-organisms associated with saltmarsh in coastal regions of subtropical and temperate Australia (south of 23oS latitude). It occurs on the coastal margin, along estuaries and coastal embayments and on low wave energy coast in places with at least some tidal connection, including rarely inundated supratidal areas, intermittently opened or closed lagoons, and groundwater tidal influences. The community occurs on sandy or muddy substrate and may include coastal clay pans and similar habitats. It consists of dense to patchy areas of characteristic coastal saltmarsh plant species that include salt- tolerant herbs,	EN	P3	Phoenix 2025a	Unlikely	Unlikely to be suitable habitat present.	Not recorded	The vegetation community (i.e., coastal saltmarsh community along estuaries with tidal influences) was not recorded within the survey area during the assessment.

Community Name	Description	Conservation status		Source	Likelihood of occurrence assessment			
		EPBC Act	BC Act / DBCA		Pre-survey	Justification	Post-survey	Justification
	succulent shrubs or grasses, and may also include bare sediment as part of the mosaic. It can occur where the proportional cover by tree canopy such as mangroves, *Melaleuca, Casuarina* or seagrass is not greater than 50%. The description, area and condition thresholds that apply to the EPBC-listed TEC of the same name, also apply to this Priority ecological community (DCCEEW 2024).							
Reedia spathacea – Empodisma gracillimum - Sporadanthus rivularis dominated floodplains and paluslopes of the Blackwood Plateau.	Diverse closed sedges and rushes to 1.5 m in height of *Reedia spathacea/Empodisma gracillimum/Sporadanthus rivularis* with open low shrubs to open scrub of *Taxandria linearifolia*. Threats: altered fire regimes, weed invasion, clearing (DBCA 2023)	-	P1	Phoenix 2025a	Unlikely	Unlikely to be suitable habitat present.	Not recorded	The vegetation community (i.e., closed sedgeland dominated by *Reedia spathacea, Empodisma gracillimum, Sporadanthus rivularis* with open low shrub layer of *Taxandria linearifolia*) was not recorded within the survey area during the assessment.
Aquatic Root Mat Community Number 1 of Caves of the Leeuwin-Naturaliste Ridge (Easter and Jewel Caves)	The community occurs in the cave system of the Leeuwin-Naturaliste Ridge incorporating Easter and Jewel Caves (DBCA 2023).	EN	CR	Phoenix 2025a	Unlikely	Restricted to the Easter and Jewel Caves of the Leeuwin-Naturaliste Ridge)	Not recorded	This community is restricted to cave environments not present in the survey area.
Rimstone Pools and Cave Structures Formed by Microbial Activity on Marine Shorelines (Augusta microbialites)	The community occurs along the south-west coast near Augusta and comprises microbialites, which are structures produced through the growth and metabolic activity of benthic microbial communities (DBCA 2023).	-	EN	Phoenix 2025a	Unlikely	Unlikely to be suitable habitat present.	Not recorded	This community is restricted to cave environments not present in the survey area.
Tall closed sedgeland on shallow soils derived from granite gneiss on the Leeuwin-Naturaliste	Tall closed sedgeland of *Juncus kraussii, Baumea juncea*, and *Schoenoplectus validus*; tall closed sedgeland of *Typha orientalis*, over *S. validus, Lepidosperma gladiatum* and *Muehlenbeckia adpressa*; low closed sedgeland of *Ficinia nodosa* and *Baumea juncea* on	-	P1	Phoenix 2025a	Unlikely	Unlikely to be suitable habitat present.	Not recorded	The vegetation community (i.e., tall closed sedgeland dominated by *Juncus krausii, Baumea juncea, Schoenoplectus validus, Typha orientalis, Ficinia nodosa* etc.) was

Community Name	Description	Conservation status		Source	Likelihood of occurrence assessment			
		EPBC Act	BC Act / DBCA		Pre-survey	Justification	Post-survey	Justification
Ridge ('Sedgelands of the Cape Leeuwin Spring')	shallow soils derived from granite gneiss on the Leeuwin-Naturaliste Ridge (DBCA 2023).							not recorded within the survey area during the assessment.
Aquatic Root Mat Community Number 4 of Caves of the Leeuwin-Naturaliste Ridge (Calgardup Cave)	The community occurs in the cave system of the Leeuwin-Naturaliste Ridge incorporating Calgardup Cave (DBCA 2023a).	EN	CR	Phoenix 2025a	Unlikely	Restricted to the Calgardup Cave of the Leeuwin-Naturaliste Ridge)	Not recorded	This community is restricted to cave environments not present in the survey area.

Appendix J Flora Species Matrix

Family	Species name	REL01	REL02	REL03
Anarthriaceae	*Anarthria scabra*	X		X
Asteraceae	**Arctotheca calendula*			X
Asteraceae	**Hypochaeris glabra*			X
Asteraceae	*Lagenophora huegelii*	X	X	
Asteraceae	**Ursinia anthemoides*			X
Cyperaceae	*Lepidosperma gracile*		X	X
Cyperaceae	*Mesomelaena tetragona*	X	X	X
Dasypogonaceae	*Dasypogon bromeliifolius*			X
Droseraceae	*Drosera sp.*	X		X
Iridaceae	**Romulea rosea*			X
Juncaceae	*Juncus pallidus*			X
Lindsaeaceae	*Lindsaea linearis*	X		
Loranthaceae	*Nuytsia floribunda*	X	X	
Myrtaceae	*Beaufortia sparsa*			X
Myrtaceae	*Corymbia calophylla*	X	X	
Myrtaceae	*Eucalyptus marginata subsp. marginata*	X	X	
Myrtaceae	*Taxandria parviceps*	X	X	X
Orchidaceae	*Pterostylis vittata*	X	X	
Poaceae	**Briza maxima*		X	X
Restionaceae	*Desmocladus fasciculatus*			X
Restionaceae	*Hypolaena exsulca*	X	X	
Rubiaceae	*Opercularia hispidula*		X	
Xanthorrhoeaceae	*Xanthorrhoea gracilis*	X	X	
Xanthorrhoeaceae	*Xanthorrhoea preissii*	X	X	X

*Introduced species

Appendix K Relevé Data

Site	Date	Site type	Observer
REL01	26/06/2025	Relevé	GM/LS
Condition	**Disturbances**	**Fire history (years)**	**Soil description**
Excellent	Grazing, weeds	Old (>20)	Grey/white Sand
Outcropping (%)	**Bare ground (%)**	**Leaf litter (%)**	**Coarse woody debris (%)**
0	1	30	5
Landform/rock type	**Vegetation type**	**Easting**	**Northing**
Limestone	CcTpCeOh	340734	6215078

Species	Cover (%)	Stratum (U=Upper, M=Middle, G=Ground)	Sub-Stratum
Corymbia calophylla	40	U	Trees 10 – 30 m
Eucalyptus marginata **subsp.** *marginata*	45	U	Trees 10 – 30 m
Nuytsia floribunda	1.5	U	Trees <10 m
Taxandria parviceps	0.1	M	Shrubs > 2 m
Xanthorrhoea preissii	3	M	Shrubs 1 – 2 m
Mesomelaena tetragona	0.5	M	Shrubs <1 m
Xanthorrhoea gracilis	1	M	Shrubs <1 m
Anarthria scabra	3	G	Sedges
Lagenophora huegelii	0.02	G	Herbs
Drosera **sp.**	0.01	G	Herbs
Lindsaea linearis	0.02	G	Herbs
Pterostylis vittata	0.01	G	Herbs
Hypolaena exsulca	0.1	G	Herbs

Site	Date	Site type	Observer
REL02	26/06/2025	Relevé	GM/LS
Condition	**Disturbances**	**Fire history (years)**	**Soil description**
Very Good	Weeds	Old (>20)	Grey/white sandy loam
Outcropping (%)	**Bare ground (%)**	**Leaf litter (%)**	**Coarse woody debris (%)**
0	2	25	10
Landform/rock type	**Vegetation type**	**Easting**	**Northing**
Limestone	CcTpCeOh	340762	6215058

Species	Cover (%)	Stratum (U=Upper, M=Middle, G=Ground)	Sub-Stratum
Corymbia calophylla	20	U	Trees 10 – 30 m
Eucalyptus marginata **subsp.** *marginata*	40	U	Trees 10 – 30 m
Nuytsia floribunda	5	U	Trees <10 m
Taxandria parviceps	3	M	Shrubs >2 m
Xanthorrhoea preissii	10	M	Shrubs 1 – 2 m
Xanthorrhoea gracilis	5	M	Shrubs <1 m
Mesomelaena tetragona	2	M	Sedges
Lepidosperma gracile	20	M	Sedges
**Briza minor*	0.01	G	Grasses
Lagenophora huegelii	0.1	G	Herbs
Pterostylis vittata	0.01	G	Herbs
Hypolaena exsulca	1	G	Herbs
Opercularia hispidula	0.3	M	Herbs

Site	Date	Site type	Observer
REL03	26/06/2025	Relevé	GM/LS
Condition	**Disturbances**	**Fire history (years)**	**Soil description**
Degraded	Grazing, weeds, clearing	Old (>20)	Grey sandy loam
Outcropping (%)	**Bare ground (%)**	**Leaf litter (%)**	**Coarse woody debris (%)**
0	20	5	2
Landform/rock type	**Vegetation type**	**Easting**	**Northing**
Limestone	XpAs	340738	6215056

Species	Cover (%)	Stratum (U=Upper, M=Middle, G=Ground)	Sub-Stratum
Taxandria parviceps	10	M	Shrubs >2 m
Xanthorrhoea preissii	30	M	Shrubs >2 m
Beaufortia sparsa	0.5	M	Shrubs >2 m
Mesomelaena tetragona	15	M	Shrubs <1 m
Juncus pallidus	0.1	G	Shrubs <1m
Anarthria scabra	0.5	G	Sedges
Lepidosperma gracile	3	M	Sedges
**Briza maxima*	5	G	Grasses
Opercularia hispidula	0.3	M	Herbs
Drosera sp.	0.1	G	Herbs
**Hypochaeris glabra*	0.5	G	Herbs
**Ursinia anthemoides*	1	G	Herbs
Desmocladus fasciculatus	0.5	M	Herbs
**Romulea rosea*	20	G	Herbs
**Arctotheca calendula*	0.5	G	Herbs

Appendix L Scott River Ironstone Association TEC assessment

Key diagnostic characteristics (DSEWPac 2013)	Outcome
Known occurrences of the community are limited to the Warren Bioregion.	The survey area is located within the Warren bioregion and therefore meets this criterion.
Soils are typically shallow, loamy sands above a substrate of ironstone.	The survey area lies on top of non-saline wet soil and pale deep sand. The soils within the relevés were described as grey/white sand occurring over Limestone and therefore did not meet this criterion.
Sites are typically seasonally inundated in winter but some areas may only experience wet/damp soils in winter.	The survey area was not seasonally inundated and although the soil was damp, it was unlikely to be to such an extent to meet this criterion.
Topsoils generally dry out quickly in late spring or summer.	Alignment with this criterion is unable to be determined given this survey was conducted in winter.
Vegetation is shrubland or heathland with an open to closed structure.	The XpAs vegetation type occurs within the survey area occurs as an open shrubland, therefore it meets this criterion.
Dominant species in the overstorey may be *Melaleuca preissiana* (moonah), *Hakea tuberculata*, *Kunzea micrantha* or *Melaleuca incana* subsp. *Gingilup* (N.Gibson & M.Lyons 593) (grey honey-myrtle).	The overstorey for the vegetation within the survey area did not contain either *Melaleuca preissiana* (moonah), *Hakea tuberculata*, *Kunzea micrantha* or *Melaleuca incana* subsp. *Gingilup* (N.Gibson & M.Lyons 593) (grey honey-myrtle).
The understorey is generally dominated by *Loxocarya magna.*	The understorey for the vegetation within the survey area did not contain Loxocarya magna.
An annual herbaceous layer is present in the dry season (Oct–April). All occurrences (except the wetter/swampier or more closed shrublands patches) have a diverse annual flora of *Stylidium* spp. (trigger-plants), *Centrolepis* spp., *Schoenus* spp. (bog-rush) and *Brizula* (now *Aphelia*) spp.	Alignment with this criterion is unable to be determined given this survey was conducted in June.

Appendix M Fauna Species List

Species name	Common name	Sign	Listing
Mammals			
Macropus fuliginosus melanops	Grey Kangaroo	Direct Observation	-
Birds			
Dromaius novaehollandiae	Emu	Direct Observation	-
*Dacelo novaeguinaea**	Laughing Kookaburra	Direct Observation	-
Barnardius zonarius semitorquatus	Australian Ringneck	Direct Observation	-
Platycercus icterotis icterotis	Western Rosella	Direct Observation	-
Malurus splendens	Splendid Fairywren	Direct Observation	-
Gymnorhina tibicen	Australian Magpie	Direct Observation	-
Rhipidura leucophrys	Willie Wagtail	Direct Observation	-
Corvus coronoides perplexus	Australian Raven	Direct Observation	-
Hirundo neoxena	Welcome Swallow	Direct Observation	-

*Introduced species