Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

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SLR Project No.: 675.VX5781.00001

October 31, 2024

Revision: 2.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorized By
1.0	July 10, 2023	SG, BM, LB, LC	EW	EW
2.0	October 31, 2024	SG, BM, LB, LC	EW	EW

Basis of Report

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Shire of Narembeen (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Statement of Limitations

The appropriate Statement of Limitations must appear in every draft and final Report issued to an SLR client. These documents are available in the Project Management Library on Connect. The documents listed on the site have been finalized and must not be altered; they have been reviewed by SLR's legal counsel and the wording is specific.

Executive Summary

The Shire of Narembeen commissioned SLR Consulting Australia Pty Ltd (SLR Consulting) to undertake a biological (reconnaissance flora and vegetation survey, basic vertebrate fauna) survey and Black Cockatoo Habitat assessment for the proposed Native Vegetation Clearing Permit (NVCP) application of two areas within the Shire of Narembeen (the Project Area). The Project Area is made up of the following two Survey Areas:

- Kondinin – Narembeen Road SLK 19.5 to SLK 23 (Northern Survey Area); and
- The intersection of Kondinin – Narembeen Road, Cheethams Road, and South Kuminin Road (Southern Survey Area)

The proposed developments within the Project Area includes the widening of an existing road network in each location that may have potential to impact on native vegetation in the immediate area. The purpose of the survey was to delineate key flora and fauna values within the Project Area. This report presents results of the survey undertaken.

Flora and Vegetation

The flora desktop assessment for the Northern Survey Area identified 70 significant flora taxa occurring within 40 km of the Project Area. A pre-survey likelihood of occurrence assessment was undertaken and determined seven taxa as having a high likelihood of occurrence, 22 taxa as having a medium likelihood of occurrence and 41 taxa as having a low likelihood of occurrence.

The flora desktop assessment for the Southern Survey Area identified 67 significant flora taxa occurring within 40 km of the Project Area. A pre-survey likelihood of occurrence assessment was undertaken and determined four taxa as having a high likelihood of occurrence, 23 taxa as having a medium likelihood of occurrence and 40 taxa as having a low likelihood of occurrence.

The reconnaissance flora and vegetation survey recorded the floristic composition and vegetation types using relevés, mapping notes and opportunistic observations. A total of 51 taxa were recorded from 33 genera across 14 families for the Project Area.

No Threatened flora species pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* and/or gazetted as Threatened Flora pursuant to the *Biodiversity and Conservation Ac*t 2016 were recorded during the survey.

No Priority species as listed by DBCA were recorded during the survey.

Seven introduced species were recorded in the Survey Area. None of these species represent a Weed of National Significance, as listed by the Department of Energy and Environment, or a Declared Pest by the State Department of Primary Industries and Regional Development.

Within the Northern Survey Area, five natural and two modified vegetation types were described and mapped for the area. Remnant patches of the the EsEsCh and EmEuEw vegetation types were considered to be representative of the Eucalypt Woodlands of the Western Australian Wheatbelt (DBCA: Priority 3) (EPBC: Critically Endangered) Threatened Ecological Community, totalling 0.27 ha.

The Southern Survey Area contained two natural and two modified vegetation types, which were described and mapped for the area. Remnant patches of the the EsEsCh vegetation type were considered to be representative of the Eucalypt Woodlands of the Western Australian Wheatbelt (DBCA: Priority 3) (EPBC: Critically Endangered) Threatened Ecological Community, totalling 0.12 ha.

Across the Project Area, vegetation condition ranged from Completely Degraded to Very Good-Good, with the majority of natural vegetation types assessed as in Good condition. Evidence of disturbance included historical clearing for roads, infrastructure and agricultural activities, as well as weeds.

Vertebrate Fauna and Black Cockatoo Assessment

The fauna desktop assessment for the Northern Survey Area identified 40 terrestrial vertebrate fauna species potentially occurring within the Survey Area. A likelihood of occurrence assessment was undertaken and determined three significant species to have a high likelihood of occurrence, two significant species to have a medium likelihood of occurrence and 18 significant species to have a low likelihood of occurrence.

The fauna desktop assessment for the Southern Survey Area identified 40 terrestrial vertebrate fauna species potentially occurring within the Survey Area. A likelihood of occurrence assessment was undertaken and determined two significant species to have a high likelihood of occurrence and 21 significant species to have a low likelihood of occurrence. There were no significant species with a medium likelihood of occurrence.

Fauna habitat mapping was based on a combination of field observations and fauna habitat assessment data. The Northern Survey Area contained three fauna habitats (excluding cleared) which were mapped within the Survey Area, including:

- Heathland/scrubland
- Trees over paddock
- Eucalyptus woodland

The Southern Survey Area contained one fauna habitat (excluding cleared); this was ‘Trees over paddock’.

The basic terrestrial vertebrate fauna and black cockatoo survey identified a total of eight species from seven families, comprising seven birds and one mammal occurring within the Northern Survey Area. A total of five species from four families, comprising four birds and one reptile were recorded within the Southern Survey Area. No significant fauna were recorded at both the Northern or Southern Survey Areas.

The black cockatoo habitat assessment identified 26 potential nesting trees with a Diameter at Breast Height (DBH) greater than 500 mm occurring within the Northern Survey Area, including:

- Nine Black Morrel (*Eucalyptus melanoxylon*)
- Four Merrit (*Eucalyptus urna*)
- Five Salmon Gums (*Eucalyptus salmonophloia*)
- Two Wandoo (*Eucalyptus wandoo* subsp. *wandoo*)
- Six Yorrel (*Eucalyptus yilgarnensis*).

One tree was found to contain two hollows which were suitable for black cockatoo roosting. A total of 20.5 ha of Low-Quality foraging habitat for the Carnaby's Cockatoo was identified from the Foraging Habitat Scoring Tool (DAWE, 2022b).

The black cockatoo habitat assessment identified six potential nesting trees with a Diameter at Breast Height (DBH) greater than 500 mm occurring within the Southern Survey Area, including:

- Three Salmon Gums (*Eucalyptus salmonophloia*)
- Two Wandoo (*Eucalyptus wandoo subsp. wandoo*)
- One Merrit (*Eucalyptus urna*).

Two trees were found to contain multiple hollows (six total, three hollows per tree) which were suitable for black cockatoo nesting. A total of 0.192 ha of low-quality foraging habitat for the Carnaby's Cockatoo as identified from the Foraging Habitat Scoring Tool (DAWE, 2022b).

The survey was undertaken in July 2023 which is within the recommended period as per the Fauna Technical Guidance (Environmental Protection Authority, 2020a) for autumn-winter breeding amphibians, however, falls outside the recommended timing for reptiles, birds and mammals. As this is not a detailed survey it does not constitute a limitation and is considered suitable for the NVCP application.

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Acronyms and Abbreviations

Abbreviation	Description
BAM Act	Biosecurity and Agriculture Management Act 2007
BC Act	Biodiversity Conservation Act 2016
BoM	Bureau of Meteorology
°C	Degree Celsius
CD	Conservation Dependent Fauna
CR	Critically Endangered
DAFF	Department of Agriculture, Fisheries and Forestry
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DP	Declared Pest
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	Environmental Protection Act 1986
EPA	Environmental Protection Authority
EPBC Act	Environment Protection Biodiversity and Conservation Act 1999
ESA	Environmentally Sensitive Area
GIS	Geographic Information System
Ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
Km	Kilometres
M	Metres
Mm	Millimetres
MA	Marine
MI	Migratory
MNES	Matters of National Environmental Significance
NVIS	National Vegetation Information System
OS	Other Specially Protected Fauna
P	Priority
Project Area	The combined Kondinin – Narembeen Road SLK 19.5 to SLK 23 Survey Area and Kondinin – Narembeen Road, Cheethams Road, and South Kuminin Road intersection Survey Area

Abbreviation	Description
PEC	Priority Ecological Community
PMST	Protected Matters Search Tool
SLR Consulting	SLR Consulting Australia Pty Ltd
Desktop Study Area	The database search area (varied according to each parameter)
Northern Survey Area	The Kondinin – Narembeen Road SLK 19.5 to SLK 23 Survey Area
Southern Survey Area	The Kondinin – Narembeen Road, Cheethams Road, and South Kuminin Road intersection Survey Area
T	Threatened
TEC	Threatened Ecological Community
TPFL	Threatened and Priority Flora Database
TPFRF	Threatened and Priority Flora Report Forms
VU	Vulnerable
WA	Western Australia
WAH	Western Australian Herbarium
WAM	Western Australian Museum
WoNS	Weeds of National Significance

1.0 Introduction

1.1 The Project

The Shire of Narembeen commissioned SLR Consulting Australia Pty Ltd (SLR Consulting) to undertake a biological (reconnaissance flora and vegetation survey, basic vertebrate fauna) survey and Black Cockatoo Habitat assessment for the proposed Native Vegetation Clearing Permit (NVCP) application of two areas within the Shire of Narembeen (the Project Area).

The Project Area is made up of the following Survey Areas:

- Kondinin – Narembeen Road SLK 19.5 to SLK 23 (herein referred to as the Northern Survey Area) which covers 9.1 ha and is located four km south of Narembeen in the Avon Wheatbelt bioregion of Western Australia (Figure 1).
- The intersection of Kondinin – Narembeen Road, Cheethams Road, and South Kuminin Road (herein referred to as the Southern Survey Area) which covers 1 ha and is located 17 km south of Narembeen in the Mallee bioregion of Western Australia (Figure 1).

The proposed developments within the Project Area include the widening of an existing road network in each location that may have potential to impact on native vegetation in the immediate area. The results and discussion of each Survey Area will be presented independently to avoid confusion and better highlight specific areas of significance within the Project Area.

1.2 Objectives and Scope

The purpose of the survey was to delineate key flora and fauna values within the Project Area and identify potential environmental sensitivities that may impact the NVCP.

The scope of works includes:

- Undertake a Desktop Assessment including relevant database searches and a literature review to compile and summarise existing records of flora, vegetation, and fauna (including significant species and communities) in the vicinity of the Project Area.
- Undertake a reconnaissance flora and vegetation survey using relevés to identify and describe the vegetation and flora occurring within the Project Area, including in-field TEC assessment.
- Undertake targeted searching for flora of significance within the Project Area.
- Undertake a basic terrestrial vertebrate fauna survey.
- Undertake a black cockatoo habitat assessment.
- Post Survey Debrief Email.
- Biological Report.
- Supply a geospatial data package prepared in accordance with IBSA requirements.

This report presents the results of the surveys undertaken to support the above objectives.

2.0 Background

2.1 Protection of Flora, Vegetation and Fauna

Western Australian flora and fauna is protected formally by the following legislative measures:

- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *WA Biodiversity Conservation Act 2016* (BC Act)
- *WA Environmental Protection Act 1986* (EP Act)
- *WA Biosecurity and Agriculture Management Act 2007* (BAM Act).

In addition to these legislative measures, the following non-legislative lists are considered on a case-by-case basis:

- WA Department of Biodiversity Conservation and Attractions (DBCA) Priority lists for fauna, flora and ecological communities.
- Weeds of National Significance (WoNS).
- Recognition of locally significant populations by DBCA.

The EIA process is supported by guidance documents published by the Environmental Protection Authority (EPA), DBCA, and the Department of Climate Change, Energy, the Environment and Water (DCCEEW):

- *Carnaby's Cockatoo (Calyptorhynchus latirostris) Recovery Plan* (DPAW, 2013)
- *Matters of National Environmental Significance Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation* Act 1999 (DoE, 2013)
- *Referral Guideline for 3 WA Threatened Black Cockatoo Species* (DAWE, 2022b)
- *Survey Guidelines for Australia's Threatened Birds* (DCCEEW, 2010)
- *Survey Guidelines for Australia's Threatened Mammals* (Department of Sustainability Environment Population and Communities, 1999)
- *Survey Guidelines for Australia's Threatened Reptiles* (DCCEEW, 2011)
- *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (Environmental Protection Authority, 2016b)
- *Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (Environmental Protection Authority, 2020b).

2.2 Existing Environment

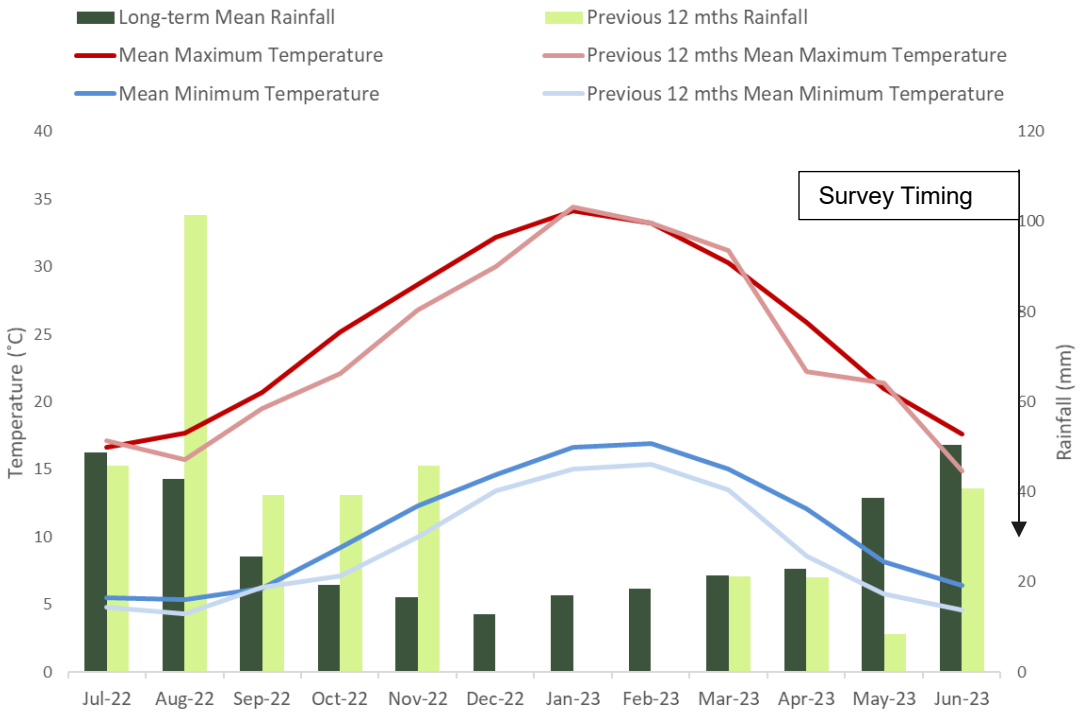
2.2.1 Climate

The closest long-term Bureau of Meteorology weather station with a complete dataset is Narembeen Weather Station (Station 010612), located approximately 17 km north of the Project Area.

Climate statistics were calculated utilising data from the most current climate normal, which is defined as a 30-year interval (BoM, 2007), where possible. A climate normal is a period long enough to include year-to-year variations while avoiding the influence of longer-term changes in climate (BoM, 2007).

The long-term mean minimum temperature for Narembeen Weather Station ranges from 16.9˚C (February) to 5.4˚C (August) (1965 to 2023) and the long-term mean maximum temperature ranges from 34.1˚C (January) to 16.6˚C (July) (Graph 1) (BoM, 2022).

The Narembeen weather station recorded 363 mm of rainfall in the 12 months prior to the survey (July 2022 to June 2023), which is 30.9 mm above the long-term average of 332.1 mm (BoM, 2022). In the three months prior to the survey (June 2023 to April 2023), 70.2 mm of rainfall was recorded, which is 41.7 mm below the long-term average of 111.9 mm for the same time period (BoM, 2022). May was an exceptionally dry month for the year of 2023, recording only 8.4 mm of rain during the entire period which is 30 mm below the long-term average of 38.6 mm. Whilst less rain was received in the months preceding the survey compared to the long-term average, the survey timing was considered adequate for the collection of ephemeral and perennial flora.



Graph 1: Long term mean rainfall, mean maximum, and mean minimum temperatures and previous 12 months rainfall, mean maximum, and mean minimum temperatures for Narembeen Weather Station (010612).

2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical, and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (DEE, 2016). The Northern Survey Area occurs within the Avon Wheatbelt bioregion and the Merredin (AVW01) subregion. The Southern Survey Area occurs within the Mallee bioregion and the Western Mallee (MAL02) subregion (Figure 2).

The Merredin (AVW01) subregion is characterised by active drainage dissecting a Tertiary plateau on the Yilgarn Craton. It has a gently undulating landscape of low relief. Proteaceous scrub heaths, rich in endemics, on residual lateritic uplands and derived sandplains; mixed eucalypts, Allocasuarina huegeliana and Jam-York Gum woodlands on Quaternary alluvial and colluvial soils. Within this bioregion, the AVW01 is an ancient peneplain with low relief, gently undulating landscape. There is no connected drainage; salt lake chains occur as remnants of ancient drainage systems that now only function in very wet years. Lateritic uplands are dominated by yellow sandplain. The dominant land uses are dry land agriculture, grazing, mining and rural residential (Beecham, 2001).

The Western Mallee (MAL02) subregion is characterised as gently undulating, with partially occluded drainage. Mallee over myrtaceous-proteaceous heaths on duplex (sand over clay) soils are common. Melaleuca shrublands characterise alluvia, and Halosarcia low shrublands occur on saline alluvium. A mosaic of mixed eucalypt woodlands and mallee occur on calcareous earth plains and sandplains overlying Eocene limestone strata in the east. The landscape is fragmented with particular surface-types almost completely cleared as wheat fields. The dominant land use is dry land agriculture (Beecham & Danks, 2001).

2.2.3 Soil Landscapes and Land Systems

Soil landscapes and land system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales, ranging from 1:20,000 to 1:250,000 (Department of Primary Industries and Regional Development, 2018). The Project Area occurs within two land systems (Table 1).

Table 1: Land systems within the Survey Area.

Land Systems		Description (Department of Primary Industries and Regional Development, 2018)
Name	Code	
Kellerberrin System	258Kb	Valley floors, in the central Zone of Ancient Drainage, with alkaline red shallow loamy duplex, alkaline grey sandy duplexes mainly in branch valleys (shallow and deep), calcareous loamy earth and hard cracking clay.
Bendering System	258Bn	Gently and irregularly undulating gneissic terrain with extensive areas of red and brown loams and clays on mafic substrate, duplexes on colluvial slopes and occasional breakaways with extensive sandplain backslopes.

2.2.4 Hydrography

Hydrographic features intersecting and in the vicinity of the Project Area are described in Table 2 (Department of Water and Environmental Regulation, 2018).

Table 2: Hydrographic features nearby the Survey Area

Hydrographical Feature	Description
Wakeman Creek	A major river flowing in the vicinity of the Survey Area. Wakeman Creek flows in a westerly direction before joining the Lockhart River approximately 18.1 km southwest of the Survey Area.

2.2.5 Broad Vegetation Types

Mapping of pre-European vegetation in Western Australia was completed on a broad scale (1:1,000,000) by Beard (1976). These vegetation types were later refined by Shepherd *et al.* (Shepherd, Beeston and Hopkins, 2002) resulting in 819 vegetation types.

Three broad vegetation system associations were encountered over the Project Area. Representation of the system associations at a local, regional and state level is shown in Table 3:

- **Hyden 131:** Woodland / Mallee:.
- **Muntadgin 1023:** Woodland other: Wheatbelt; York gum, salmon gum etc. Eucalyptus loxophleba, E. salmonophloia. Goldfields; gimlet, redwood etc. E. salubris, E. oleosa. Riverine; rivergum E. camaldulensis. Tropical; messmate, woolyb.
- **Muntadgin 961:** Scrub-heath / thicket:.

Table 3: Broad vegetation types within the Survey Area and their representation at the state, regional, and local levels (DBCA, 2019).

Vegetation Association	Extent			
	Pre-European (ha)	Current (ha)	Remaining (%)	Managed in DBCA Lands (%)*
Representation across Western Australia				
131	181,154.83	14,875.75	8.21	11.81
1023	1,601,605.76	172,875.16	10.79	10.95
961	27,799.68	5,006.65	18.01	57.23
Representation across the Mallee Bioregion				
131	111,511.96	10,027.08	8.99	14.54
Representation across the Western Mallee (MAL02) Subregion				
131	111,511.96	10,027.08	8.99	14.54

Vegetation Association	Extent			
	Pre-European (ha)	Current (ha)	Remaining (%)	Managed in DBCA Lands (%)*
Representation across the Avon Wheatbelt Bioregion				
1023	398,944.17	26,714.63	6.70	11.11
961	1,676.30	330.44	19.71	22.24
Representation across the Merredin (AVW01) Subregion				
1023	398,944.17	26,714.63	6.70	11.11
961	1,676.30	330.44	19.71	22.24
Representation across the Shire of Narembeen				
131	93,637.38	6,409.95	6.85	4.19
1023	35,978.71	2,446.12	6.80	1.93
961	6,927.58	907.98	13.11	14.04

2.2.6 Environmentally Sensitive and Conservation Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs) or significant wetlands.

The Project Area does not occur within a mapped ESA (Figure 3). The nearest ESA is a defined Nature Reserve (North Karlgarin Nature Reserve), located approximately 18 km south of the Southern Survey Area (Department of Water and Environmental Regulation, 2020).

Two conservation areas were identified as occurring within the locality of the Project Area(Department of Biodiversity Conservation and Attractions, 2021) (Figure 3):

- Emu Hill Nature Reserve located immediately adjacent to the southeast of the Northern Survey Area and is vested under the Shire of Narembeen.
- South Kuminin Nature Reserve, located 400 m north of the Southern Survey Area and is vested under the Shire of Narembeen.

2.2.7 Land Use

The Project Area is located on the road reserve maintained by the Shire of Narembeen. It is a major road that connects the townsite to its neighbouring towns and shires and is used frequently by various vehicles and farming machinery as a major arterial roadway.

3.0 Methods

The biological surveys documented by this report were undertaken in accordance with relevant EPA and DCCEEW guidelines (see **Section 2**).

3.1 Desktop Assessment

3.1.1 Literature Review

Background information on the Project Area and surrounds was compiled prior to the field survey (see Section 2). Historical vegetation mapping (Beard, 1976; Shepherd et al., 2002), land systems mapping (Department of Primary Industries and Regional Development, 2018), and the IBRA classification system (Beecham, 2001) were consulted to provide broad contextual knowledge of the vegetation units and habitat likely to be encountered within the Project Area.

The literature review also considered a selection of biological reports detailing assessments undertaken in the region, that were either publicly available or provided by the Shire of Narembeen.

3.1.2 Database Searches

Database searches were undertaken to compile a list of potential flora and fauna and identify potential significant flora, fauna, and ecological communities within or surrounding the Survey Areas (Table 5). In addition, an EPBC Protected Matters Search (PMST) was undertaken to identify the potential for Matters of National Environmental Significance (MNES) to occur within or surrounding the Survey Area (DCCEEW, 2022).

The search area for each parameter was varied to reflect distances recommended by DBCA. The search areas are herein referred to collectively as the Study Area.

Table 4: List of database searches.

Database Name	Date Received	Search Target	Buffer around the Survey Area
Threatened and Priority Ecological Communities database search (Department of Biodiversity Conservation and Attractions, 2023)	19/06/2023	TECs and PECs	30 km
Threatened and Priority Flora (TPFL) database search (Department of Biodiversity Conservation and Attractions, 2023)	16/06/2023	Threatened and Priority Flora	40 km
Western Australian Herbarium flora database search (Department of Biodiversity Conservation and Attractions, 2023)	16/06/2023	Threatened and Priority Flora	40 km
DBCA Threatened and Priority Fauna database search (Department of Biodiversity	14/06/2023	Threatened and Priority Fauna	80 km

Database Name	Date Received	Search Target	Buffer around the Survey Area
Conservation and Attractions, 2022c)			
DBCA Black Cockatoo database search (Department of Biodiversity Conservation and Attractions, 2023)	27/06/2023	Black Cockatoo breeding and roosting locations	80 km
Protected Matters Search Tool (Department of Agriculture Water and the Environment, 2023)	22/6/2023	Commonwealth listed Threatened flora and fauna and TECs	50 km

3.1.3 Likelihood of Occurrence

Significant flora and fauna species identified from the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area, both prior to and post field survey. The assessment was completed based on the likelihood of occurrence criteria presented in Table 5.

Only species either recorded within the Survey Area or considered as having a high or medium likelihood of occurrence will be discussed in detail. Species classified as having a low likelihood of occurrence based on the above criteria will not be discussed unless a justification for this classification is required.

For fauna, taxa listed as Marine only under the EPBC Act were not included as significant taxa because the Marine only listed taxa identified by the desktop assessment and field survey were common and widespread, taxa listed as Marine only do not constitute MNES under the EPBC Act, and the Survey Area does not contain any marine habitat. Additionally, taxa that rely exclusively on marine habitats or erroneous records (ie records of extinct or locally extinct taxa, or records that occur obviously outside a taxon's known distribution) have been excluded from consideration.

Table 5: Likelihood of Occurrence Criteria

Rank	Criteria
Previously Recorded	The species has been previously recorded in the Survey Area
High (Likely to occur)	There are existing records of the species in close proximity to the Survey Area (within 5 km), and for fauna has been recorded in the Survey Area in the last 15 years, and: • The species is strongly linked to a specific habitat, which is present in the Survey Area; or • The species has more general habitat preferences, and suitable habitat is present.
Medium (May occur)	There is suitable habitat in the Survey Area, but the species is recorded infrequently in the locality; or There are existing records of the species from the locality (between 5-20 km), however: • The species is strongly linked to a specific habitat, of which only a small amount is present in the Survey Area; or

Rank	Criteria
	• The species has more general habitat preferences, but only some suitable habitat is present.
Low (Unlikely to occur)	The species is linked to a specific habitat, which is absent from the Survey Area; or Suitable habitat is present, however there are no existing records of the species from the locality despite reasonable previous search effort in suitable habitat; or There is some suitable habitat in the Survey Area, however the species is very infrequently recorded in the locality.

3.2 Flora and Vegetation

3.2.1 Field Survey

The flora and vegetation surveys were led by Associate Botanist Rebecca Mason, who has 10+ experience conducting surveys of similar scope throughout Western Australia. The survey was conducted from 04 – 05 July 2023. Survey effort is demonstrated in Figure 4a for the Northern Area and Figure 4b for the Southern Area. The Project Area was traversed on foot to verify the accuracy of the desktop assessment and to further delineate and characterise the flora and vegetation.

3.2.2 Establishment of Flora Sites

Indicative flora sites were identified prior to the survey using aerial photography, and adjacent available vegetation mapping, to estimate broad vegetation patterns within the Survey Areas. The location and number of flora sites completed were adjusted on site to achieve sites most representative of the vegetation present.

Due to the linear nature of the Survey Areas, patches of remnant vegetation were generally not large enough to accommodate three flora sites per vegetation type.

Flora sites were relevés, which comprised unbounded sites of approximately 10 x 10 m where possible, or alternate configurations approximately equating to 100 m^2. A comprehensive record of the flora present at the time of sampling was recorded.

Flora site location was recorded using a handheld Garmin GPS unit, with points recorded at each corner of a quadrat, the start and finish point of linear relevés, and the central point of circular relevés. At each flora site, the following was recorded using a Fulcrum mobile data collection device:

- Site code
- Date and personnel
- Landform and soil description
- Relevant site descriptors including, slope, aspect, litter cover, bare ground cover and fire history
- Inventory of vascular flora including the approximate average height and percentage foliar cover for each taxon recorded

- Vegetation description in accordance with the National Vegetation Information System (NVIS), Level 5 'association', whereby the dominant growth form, height, cover and species (three species) for the three traditional strata (upper, mid and ground) are described / Level 6 'sub-association', whereby the dominant growth form, height, cover, and species (up to five species) for the three traditional strata (upper, mid, and ground) are described
- Vegetation condition in accordance with the South West and Interzone Botanical Province vegetation condition scale (Environmental Protection Authority, 2016a), and evidence of disturbance (for example clearing, rubbish, feral animals, weed incursion and evidence of feral animals and dieback) where present
- Photograph of the vegetation occurring within the site.

A total of 6 relevés were established within the Survey Area. An additional 33 mapping notes were completed to aid vegetation mapping delineation.

3.2.3 Opportunistic Flora

Additional flora taxa observed opportunistically around flora sites or while traversing on foot within the Survey Area were also recorded. Where populations of significant flora taxa, Declared Pests (DPs) or WoNS were encountered, a GPS location and a count of the individuals present was recorded.

3.2.4 Targeted Searching

Prior to the survey significant flora with the likelihood or potential to occur within the Survey Area was compiled (see Section 3.1.3). Field personnel familiarised themselves with photographs, reference samples and descriptions of these taxa before conducting the survey.

The entirety of each Survey Area was not systematically searched. Rather, targeted searching focussed on habitat suitable for significant flora identified by the database searches.

Specimens of any potential significant flora that could not be identified in the field were collected for identification and lodgement at the Western Australian Herbarium (WAH).

3.2.5 Taxonomy and Nomenclature

Where field identification of plant taxa was not possible, specimens were collected for identification using resources of the WAH. Identification of flora collections was completed by experienced Taxonomist Beth Loudon.

The finalised species list was checked against FloraBase (Department of Biodiversity Conservation and Attractions, 2023) to determine the conservation status and known distribution of each taxon. Introduced species were compared against the current BAM Act Declared Plants list the WoNS list to determine their control status (Department of Agriculture Water and the Environment, 2023; Department of Primary Industries and Regional Development, 2023).

Any significant flora taxa, including potential Threatened and Priority species, range extensions and potential new taxa were submitted to the WAH for verification and lodgement. Where relevant, Threatened and Priority Flora Report Forms (TPFRFs) were submitted to DBCA.

3.2.6 Vegetation Unit and Condition Mapping

Broad vegetation and condition mapping was conducted in the field, with boundaries delineated over aerial photography, at a scale of 1:5,000. Vegetation units were refined based on taxonomic identification of flora collections, statistical analysis of data collected from the quadrats and relevés, and mapping notes taken during the field survey. Vegetation condition mapping was refined based on site data and mapping notes. Finalised polygons were digitised and produced as electronic mapping data using GIS software.

3.2.7 Eucalypt Woodlands TEC Diagnostic Criteria

The Commonwealth 'Eucalypt Woodlands of the Western Australian Wheatbelt' was listed as a Critically Endangered TEC (Eucalypt Woodlands TEC) under the EPBC Act on the 4 December 2015. The DCCEEW provides guidance through the Approved Conservation Advice for the Eucalypt Woodlands of the Western Australian Wheatbelt document (DEE, 2015), which was used to determine the presence of this TEC within the survey areas.

Areas of mapped vegetation within both the Northern Survey Area and Southern Survey Area that were considered to potentially align with the Eucalypt Woodlands TEC were assessed in the field against the key diagnostic characteristics, contra-indicators and condition thresholds presented in Table 6 below.

A summary of this assessment for the Northern and Southern Survey Areas are provided in Appendix F and Appendix M respectively.

Table 6: Assessment against the key diagnostic criteria for the '*Eucalypt Woodlands of the Western Australian Wheatbelt'* TEC

Key Diagnostics	Criteria
Location	The distribution of the ecological community is limited to these IBRA bioregions and subregions: • Avon Wheatbelt (subregions AVW01 or AVW02) • Western Mallee subregion (MAL02); and • Jarrah Forest – outlying patches in the eastern parts of the JAH01 Northern Jarrah forests and JAH02 Jarrah forests adjacent to the Avon Wheatbelt.
Structure	The structure of the Ecological community is a woodland in which minimum crown cover of the tree canopy in a mature woodland is 10%. The maximum tree canopy cover is up to 40%.
Key species	The key species of the tree canopy are species of Eucalyptus as identified in Table 2a of the Approved Conservation Advice (DEE, 2015). These are species that typically have a single trunk. • One or more of the tree species in Table 2a are dominant or co-dominant within a patch of the ecological community. If other species are present in the tree canopy (eg species in Table 2b or other taxa) then these collectively do not occur as dominants in the tree canopy.
Composition	A native understorey is present but is of variable composition, being a combination of grasses, other herbs and shrubs, as specified in section 2.3.2 and in Table A1 of Appendix B of the Approved Conservation Advice Document (DEE, 2015).

<table>
<tr><th>Key Diagnostics</th><th colspan="5">Criteria</th></tr>
<tr><td>Presence of contra indicators</td><td colspan="5">1. A dominant presence of eucalypts with a mallee growth form. (However, mallee species can occur as an understorey or minor canopy component of the ecological community).
2. A dominant presence of non-eucalypt species in the tree canopy, eg. Acacia acuminata or Allocasuarina huegeliana. These non-eucalypts species can be present as an understorey or minor canopy component of the ecological community.
3. Shrublands or herblands in which the tree canopy layer is very sparse to absent, either naturally or maintained so through long-term disturbance.
4. Woodlands that have the same key eucalypt species but occur in adjacent bioregions, notably the Coolgardie, Esperance Sandplains, Yalgoo and Geraldton Sandplains bioregions.
5. Woodlands dominated by eucalypts that are restricted to granite outcrops and rocky rises, for instance Eucalyptus caesia.</td></tr>
<tr><td rowspan="5">Condition thresholds (used for non-roadside patches only)</td><td>Category and Vegetation Condition (Environmental Protection Authority, 2016b)</td><td>Weed Cover</td><td>Mature Trees</td><td>Min Patch Size (non-roadside patches)</td><td>Min Patch Width (roadsides only)</td></tr>
<tr><td>A:Pristine/Excellent/ Very Good</td><td>0-30%</td><td>Present or Absent.</td><td>>2h</td><td>>5m</td></tr>
<tr><td>B: Good</td><td>30-50%</td><td>Present with >5 trees per 0.5 ha.</td><td>>2h</td><td>>5m</td></tr>
<tr><td>C: Good</td><td>30-50%</td><td>Absent OR <5 trees per 0.5 ha.</td><td>>5ha</td><td>>5m</td></tr>
<tr><td>D: Good/Degraded</td><td>50-70%</td><td>Present with >5 trees per 0.5 ha.</td><td>>5ha</td><td>>5m</td></tr>
</table>

3.3 Vertebrate Fauna

3.3.1 Field Survey

The basic vertebrate fauna survey was conducted by Senior Ecologist Simon Girando who has five years of experience conducting surveys of similar scope throughout Western Australia. The survey was conducted from 04 – 05 July 2023. Survey effort is demonstrated in Figure 4a and Figure 4b. The Project Area was traversed on foot to verify the accuracy of the desktop assessment and to further delineate and characterise fauna habitats in the Survey Area.

3.3.2 Fauna Habitat Assessment

Fauna habitat assessments were undertaken throughout the Survey Area to identify fauna habitat values. Habitat assessment locations are shown in Figure 4a and Figure 4b. The following information was collected at each site using Fulcrum, a mobile data collection app:

- Site photo
- Landform
- Soil type and colour
- Rock types, surface stone cover and size classes
- Key habitat and microhabitat features including leaf litter, logs, burrows, rocky outcrops, rock crevices, hollows, water sources
- Habitat quality, fire history and evidence of disturbance
- General description of vegetation structure.

Fauna habitat mapping was based on a combination of field observations, fauna habitat assessment data and vegetation mapping undertaken by SLR Consulting staff.

3.3.3 Opportunistic Observations

Opportunistic observations of fauna were recorded throughout the Survey Area. Observations of primary evidence (direct sightings, calls) and secondary evidence (tracks, scats, diggings etc.) were recorded using the mobile data collection application Fulcrum.

3.3.4 Identification and Taxonomy

Where there was doubt on a species name (through subsequent name changes or taxonomic reviews), an effort was made to determine the current scientific name for each taxon. Taxonomy and nomenclature in this report follows the WA Museum checklist 2022 (WAM, 2022) where relevant.

3.4 Black Cockatoos

3.4.1 Field Survey

The Black Cockatoo assessment was undertaken alongside the Vertebrate Fauna Survey and involved traversing the Survey Area by foot. The survey was conducted in accordance with the "*Referral Guidelines for 3 Threatened Black Cockatoo Species: Carnaby's Cockatoo, Baudin's Cockatoo and Forest Red-tailed Black Cockatoo"* (DAWE, 2022b).

3.4.2 Nesting Habitat

Nesting tree species with the potential to form suitable hollows, including eucalypt species endemic to southwest Western Australia (eg Jarrah, Tuart, Marri, Wandoo, and Salmon Gum) and non-endemic eucalypt species that meet the following criteria were recorded using the Fulcrum mobile data-collection application:

- Trees with a diameter at breast height (DBH) of greater than 500 mm (greater than 300 mm for Wandoo and Salmon Gum) that do not contain hollows or contain hollows that are unsuitable for black cockatoo nesting, for example hollows with an estimated opening diameter of less than 100 mm or downwards-facing hollows, will be recorded as potential nesting trees.
- Trees that contain hollows that are potentially suitable for black cockatoo nesting, for example upwards or sideways-facing hollows with an estimated opening diameter of greater than 100 mm (Saunders et al., 1982), will be recorded as suitable nesting trees.

DBH was measured approximately 1.3 m from the ground. Hollows (if present) were observed from the ground. In instances where trees had multiple stems, the largest stem was measured. In instances where trees had swellings or forking/branching at breast height, the diameter was measured as close as possible to breast height, above or below the swelling/forking, to gain a more accurate measurement of diameter.

Nesting tree locations were recorded using a Differential GPS with a ±30 mm accuracy. The tree location was taken from a 2 m height above the base of the tree at the point closest to the road.

3.4.3 Night Roosting Habitat

Potential night roosting habitat within the Survey Area was identified and mapped based on tree species present and height.

3.4.4 Foraging Habitat

Habitat was assessed for tree and shrub species known to be important dietary items such as Marri and *Banksia* spp. as outlined within the referral guidelines. It also included looking for:

- Evidence of feeding (chewed cones, seed and nut material).
- Opportunistic observations of black cockatoos foraging or utilising the Survey Area
- Evidence of significant plant disease in the area (eg *Phytophthora,* Marri canker etc.).

Foraging habitat was mapped and classified as per the foraging quality scoring tool from the *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022b) and the scoring system developed by Bamford Consulting Ecologists (2020).

4.0 Limitations

Limitations and constraints of the flora, vegetation and fauna surveys are detailed below Table 7. Despite the limitations identified the biological assessment is suitable to support the NVCP application for the proposed road widening within the Survey Area.

Table 7: Limitations and Constraints associated with the Survey.

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Survey Scope	No limitation	The reconnaissance flora and vegetation survey was undertaken in accordance with EPA (Environmental Protection Authority, 2016b) and was considered appropriate to support the NVCP application. Targeted searching for flora of significance was undertaken on foot over the entire Survey Area. The basic terrestrial vertebrate fauna survey was undertaken as per EPA guidelines (Environmental Protection Authority, 2020b), and the black cockatoo assessment was undertaken as per relevant guidelines (Department of Agriculture Water and the Environment, 2022b).
Availability of Data	No limitation	All data required to complete the scope of works including regional and local contextual information was available.
Site Access	No limitation	The Survey Area was able to be accessed by vehicle and on foot.
Survey Intensity and Resources	No limitation	Six flora sites (relevés) were sampled across the Survey Area. An additional 33 mapping notes were undertaken to aid vegetation mapping and delineation. Sufficient time was allocated to the flora and vegetation survey, given the size of each Survey Area, and the expected level of survey intensity. The survey effort was considered adequate to assess the flora and vegetation values of the Survey Area and provide information required to support the NVCP application. The basic fauna survey comprised five fauna habitat assessments and 33 black cockatoo habitat trees which adequately captured the fauna habitats and black cockatoo foraging habitats present in the Survey Area. Sufficient time and resources were allocated to the biological survey.
Experience	No limitation	The flora and vegetation survey was undertaken by Associate Botanist Rebecca Mason. Rebecca has 10+ years experience conducting surveys of similar scope throughout Western Australia. Identification of flora collections were completed by Rebecca Mason and experienced taxonomist Beth Loudon at the WAH. The fauna survey was undertaken by Senior Ecologist Simon Girando. Simon has two years of consulting experience and over five years of field experience conducting surveys of similar scope throughout Western Australia and the Avon Wheatbelt bioregion.

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Timing, weather, season	No limitation	The recommended primary survey period for the region as per the EPA Technical Guidance occurs within the spring season (September - November). However, given the scope of the assessment, it is not required to survey during the primary survey period and is still considered suitable timing for the NVCP application. The timing for the basic vertebrate fauna survey and black cockatoo habitat assessment was not a limitation for autumn-winter breeding amphibians as per the Technical Guidance (Environmental Protection Authority, 2016c) but was outside the primary survey periods for reptiles, birds, and mammals. As this is not a detailed survey it does not constitute a limitation and is considered suitable for the NVCP application.
Life Forms Sampled	No limitation	Both Survey Areas were accessed via vehicle and traversed on foot. Representative sites of all remnant vegetation was sampled. All native flora species encountered within the Survey Area were recorded. Northern Survey Area: A total of 47 vascular flora taxa were recorded, comprising 85.1% native flora taxa and 14.9% introduced flora taxa. Of the 47 flora taxa recorded, seven taxa (14.9%), could not be identified to species level because they were sterile at the time of the survey. This was not considered a constraint as it represented a small portion of the flora sampled, and was expected given the agricultural setting. None of the unknown flora taxa collected were analogous to Threatened or Priority flora taxa. Southern Survey Area: A total of 23 vascular flora taxa were recorded, comprising 78.3 % native flora taxa and 21.7% introduced flora taxa. Of the 23 flora taxa recorded, two taxa (8.7%), could not be identified to species level because they were sterile at the time of the survey. This was not considered a constraint as it represented a small portion of the flora sampled. None of the unknown flora taxa collected were analogous to Threatened or Priority flora taxa. The basic vertebrate fauna and black cockatoo surveys used a wide range of detection techniques to detect fauna taxa within the Survey Areas. All vertebrate fauna species were readily identified in the field.
Mapping Reliability	No limitation	Vegetation types were described and mapped based on relevé data and additional mapping notes taken during the field survey. High resolution aerial mapping current at the time of the survey was used to differentiate vegetation patches. The greatest effort was expended ground truthing vegetation boundaries within and near the proposed development footprint. Fauna habitat mapping was based largely on vegetation mapping and there were no constraints on mapping reliability.

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Disturbances (fire, flood etc.)	No limitation	No disturbances occurred during the survey. Areas of disturbance associated with agricultural activities and clearing of roadside reserves containing high weed coverage, were observed but were not a constraint to the results of the survey.
Completeness	No limitation	The survey is considered complete for a reconnaissance flora and vegetation survey, all vegetation types were surveyed and delineated within both Survey Areas. The survey is considered complete for a basic vertebrate fauna and black cockatoo habitat assessment, all fauna habitats were assessed and delineated within both Survey Areas.

5.0 Results for Northern Survey Area

5.1 Flora and Vegetation

5.1.1 Literature Review

The key findings of the flora and vegetation reports reviewed are summarised in Appendix B.

5.1.2 Database Results

Database and literature review searches identified 70 significant flora species occurring within 40 km of the Survey Area (Figure 5), comprising:

- 4 Threatened species
- 10 Priority 1 species
- 13 Priority 2 species
- 34 Priority 3 species
- 9 Priority 4 species

No State or Commonwealth listed TECs were identified within the Survey Area by the database searches.

One Commonwealth TEC, which is also a State-listed Priority PEC, has been identified as occurring within 5.8km south-east of the Survey Area (Figure 6):

- Eucalypt Woodlands of the Western Australian Wheatbelt (DBCA: Priority 3) (EPBC: Critically Endangered).

5.1.3 Likelihood of Occurrence

The pre-survey likelihood of occurrence assessment identified that of the 70 significant flora species identified by the desktop assessment:

- None had previously been recorded within the Survey Area
- Seven were considered to have a high likelihood of occurrence
- 22 were considered to have a medium likelihood of occurrence
- 41 were considered to have a low likelihood of occurrence.

Following the survey, the likelihood of occurrence assessment identified that:

- No significant flora taxa were recorded within the Survey Area
- No taxa were considered to have a high likelihood of occurrence
- One taxa was considered to have a medium likelihood of occurrence
- All remaining 69 taxa were considered to have a low likelihood of occurrence.

The likelihood of occurrence assessment for the Northern Area is provided in Appendix C.

5.1.4 Flora Composition

The survey recorded a total of 47 taxa from 31 genera across 14 families (Appendix D). The dominant families were Myrtaceae (16 species), Poaceae (5 species) and Fabaceae (5 species). The most dominant genera was *Eucalyptus* (11 species).

5.1.5 Flora of Significance

5.1.5.1 Threatened or Priority Flora

No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened pursuant to the BC Act 2016 were recorded during the survey.

No Priority species as listed by DBCA were recorded within the Survey Area.

5.1.5.2 Flora of Other Significance

Flora may be considered of other significance if it represents a range extension, novel taxon, species that play a keystone role in a community, has relic status, is locally endemic, or represents the extent of a species range. No taxa recorded from the Survey Area were considered to represent flora of other significance.

5.1.6 Introduced Flora

A total of seven introduced species were recorded within the Survey Area, representing 14.9% of the total taxa recorded (Table 8). None of these seven species are listed as either Declared Pests under the BAM Act (Department of Primary Industries and Regional Development, 2021), or as WoNS (Department of Agriculture Water and the Environment, 2021).

Introduced species are allocated an 'Ecological Impact' and an 'Invasiveness' ranking under the DBCA Weed Prioritisation Process for the Wheatbelt Region (DBCA, 2016). Of the seven introduced species encountered in the survey area, two species are ranked High for Ecological Impact and Rapid for Invasiveness.

Introduced flora were common throughout modified areas, however no attempt was made to capture every taxa encountered, due to the extensive nature of these areas within the Survey Area, and its agricultural setting.

Table 8: Introduced Flora Recorded in the Survey Area and their ranking under the DBCA Weed Prioritization Process (DBCA, 2016).

Taxon	Common Name	Ecological Impact	Invasiveness	Declared BAM Act	WONS
**Bromus rubens*	Red Brome	H	R	Permitted - s11	No
**Ehrharta calycina*	Perennial Veldtgrass	H	M	Permitted - s11	No
**Erigeron bonariensis*	Flax-leaf Fleabane	-	-	Permitted - s11	No
**Poa annua*	Winter Grass	U	U	Permitted - s11	No

Taxon	Common Name	Ecological Impact	Invasiveness	Declared BAM Act	WONS
**Raphanus raphanistrum*	Wild Radish	U	R	Permitted - s11	No
**Romulea rosea*	Guildford Grass	H	R	Permitted - s11	No
**Sonchus oleraceus*	Common Sowthistle	U	R	Permitted - s11	No

5.1.7 Unconfirmed Flora

Seven specimens (14.9% of the taxa recorded) could not be identified to species level because the taxa were sterile at the time of the survey (Appendix D). All seven species have been assigned a confirmed genus and six have been tentatively identified to species level.

None of the unconfirmed flora taxa were analogous to Priority flora taxa identified by the database searches.

5.1.8 Vegetation Types

The natural and modified vegetation remnants identified during the survey accounted for 5.77 ha (63.5%) of the total Survey Area. Five natural vegetation types, and two modified vegetation types, were described and mapped across one broad landform (Table 9, Figure 7). One additional mapping unit representing the bitumen road (RD).

Detailed site sheets for each relevé are provided in Appendix E.

5.1.9 Vegetation Condition

Vegetation condition within the Survey Area predominantly ranged from Completely Degraded to Very Good-Good, of the 5.77ha of natural and modified vegetation remnants assessed within the Survey Area (Figure 8), comprising:

- Very Good-Good (0.21 ha / 3.7%)
- Good (1.49 ha / 25.8%)
- Degraded (0.35 ha / 6.0%)
- Completely Degraded (3.72 ha / 64.5%).

The remaining 3.32ha of the Survey Area represented the Kondinin -Narembeen Rd, which was automatically exempt from a vegetation condition assessment.

Evidence of disturbance included historical clearing for roads, infrastructure and agricultural activities, as well as weeds.

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Table 9: Natural vegetation types recorded in the Northern Survey Area.

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Vegetation Condition	Photograph
EsEsCh: Eucalyptus *salmonophloia*,, *E. salubris* woodland over *Marieana brevifolia* and *Sclerolaeana diacantha* low sparse shrubland over *Eriachne ?ovata* and **Poa annua* low sparse grassland.	Gravelly Plain	0.11 ha (1.22%)	Map Notes	Good	
EyCh: Eucalyptus *yilgarnensis* low woodland over **Poa annua* grassland.	Gravelly Plain	0.06ha (0.61%)	Map Notes	Degraded	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Vegetation Condition	Photograph
EICh: Eucalyptus *loxophleba subsp. lissophloia* low woodland over *Santalum acuminatum* mid sparse shrubland over *Marieana brevifolia, M. suadifolia* and *Daviesia aphylla* low sparse shrubland over *Austrostipa elegantissima*, *Eriachne ?ovata* low sparse grassland over *Dianella revoluta* low sparse forbs.	Gravelly Plain	0.41 ha (4.53%)	NARR03, NARR06	Degraded to Very Good-Good	
EmEuEw: Eucalyptus *melanoxylon, E. urna, E. wandoo* open woodland over mixed *Chenopodiaceae* isolated shrubs over **Poa annua* sparse low grassland.	Gravelly Plain	0.17 ha (1.85%)	Map Notes	Degraded - Good	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Vegetation Condition	Photograph
MyHe: Mixed Myrtaceous heathland	Gravelly Plain	0.19 ha (2.07%)	Map Notes	Degraded - Good	
RE*: Eucalyptus ?astringens, E. ?cylindriflora* and *E. torquata* woodland over *Acacia acuminata* tall sparse shrubland over *Melaleuca ?lanceolata* mid sparse shrubland over *A. hemiteles, Marieana brevifolia* and *Sclerolaeana diacantha* low sparse shrubland over **Poa annua* sparse low grassland.	Gravelly Plain	1.11 ha (12.23%)	NARR02, NARR05	Degraded - Good	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Vegetation Condition	Photograph
PC: Vegetation no longer intact and the area is completely or almost completely without native species. Flora comprised of crop species, mixed introduced flora with some isolated native trees and shrubs.	Gravelly Plain	3.72 ha (40.96%)	Map notes	Completely Degraded	

5.1.10 Vegetation of Significance

No State or Commonwealth listed TECs were previously identified within the Survey Area by the database searches. The nearest previously recorded occurrence of the Eucalypt Woodland TEC, is located 5.8km south-east of the Survey Area (see Section 5.1.2, Figure 9):

However, the Eucalypt Woodlands TEC and its equivalent DBCA-listed PEC was confirmed as occurring at several locations of remnant vegetation within the Survey Area, as a result of in situ field patch assessments and consideration against key diagnostic criteria (see Figure 9, and Appendix F for patch assessment).

A total of 6 remnant vegetation patches represented by the EsEsCh and EmEuEw vegetation types were considered to be representative of the Eucalypt Woodlands TEC, totalling 0.27 ha (2.97%) of the Survey Area.

5.1.11 Vegetation of Other Significance

Vegetation may be of significance for a range of reasons, other than a listing as a TEC or a PEC, including (Environmental Protection Authority, 2016a):

- Vegetation extent being below a threshold level
- Scarcity
- Unusual species
- Novel combinations of species
- A role as a refuge
- A role as a key habitat for threatened species or large populations representing a significant proportion of the local to regional total population of a species
- Being representative of the range of a unit (particularly a good local and/or regional example of a unit in ‘prime’ habitat, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range); and/or
- A restricted distribution.

No vegetation identified within the Survey Area was considered to represent vegetation of other significance.

5.2 Vertebrate Fauna

5.2.1 Literature Review

The key findings of the literature review are summarised in Appendix G.

5.2.2 Database Searches

Database searches identified 40 terrestrial vertebrate fauna species potentially occurring within the Survey Area, comprising:

- 21 bird species
- 18 mammal species
- One reptile species

The results of the DBCA Threatened and Priority Fauna database search are presented in Figure 10. Database searches are displayed in their entirety in Appendix H.

Species listed as Marine only under the EPBC Act, such as the Rainbow Bee-eater, as well as marine dependent species including the have been excluded from the likelihood of occurrence list as there is no marine habitat present within the Survey Area.

5.2.3 Fauna Habitat

Three broad fauna habitats (excluding cleared areas) were identified and mapped within the Survey Area (Figure 11). Habitat condition remained consistent throughout the Survey Area, with the most prolific disturbances being historic clearing for road networks and paddocks, and weeds.

A description, extent within the Survey Area and a representative photo is provided for each fauna habitat in Table 10. Small discrepancies in fauna habitat extents (ie not adding up to the exact area extent of the Survey Area) are due to rounding. Fauna habitat mapping is presented in Figure 11 and site sheets for each habitat assessment are shown in Appendix I.

Table 10: Fauna Habitats Within the Survey Area

Fauna Habitat	Total Area, Proportion of the Survey Area	Habitat Description	Representative Photo
Heathland/scrubland	0.07 ha, 0.82%	Deep sandy loam plains interspersed with sandstone pebbles throughout the majority of the landscape. Granite outcropping occurs occasionally in the broader landscape but not within the Survey Area. The vegetation is dominated by native *kwongan* heath of the Wheatbelt region characterised by various *Myrtaceae*, P*roteaceae*, and *Fabaceae* shrub species. *Microhabitat*s include dense leaf litter and woody debris which provide shelter for small mammals and reptiles. The density of the vegetation also provides suitable habitat for larger, more cryptic fauna species including *macropods* and medium-to-large a*vifauna* (eg *Malleefowl* and *Emu*). Mild disturbances were observed, mainly old clearing, vehicle tracks, and litter.	

Fauna Habitat	Total Area, Proportion of the Survey Area	Habitat Description	Representative Photo
Trees over paddock	1.51 ha, 16.6%	Deep sandy loam plains throughout the landscape with remnant or planted eucalypt species over cleared paddock. Microhabitats include tree hollows, leaf litter, peeling bark, and woody debris that provide shelter for a wide range of various fauna species. The most important habitats are the various tree hollows which may provide suitable nesting habitat for black cockatoos. The largest disturbance was the clearing of native understorey for paddock that is still prolific throughout large portions of the Survey Area, as well as litter and weeds.	
Eucalyptus Woodland	0.46 ha, 5.08%	Deep sandy loam plains throughout the landscape with remnant *eucalyptus* woodland vegetation with intact native understorey with full vegetative structure. Vegetation species include various eucalypt trees over a shrubland of various *Proteaceae*, *Myrtaceae*, and Fabaceae species, and an understorey of native grasses and sedges. Microhabitats include tree hollows, hollow logs, dense leaf litter, peeling bark, and woody debris. This habitat is likely to be the most utilised habitat within the Survey Area by a variety of fauna species including black cockatoos. The most prolific disturbances were old clearing, vehicle tracks, litter, and weeds.	
Cleared	7.04 ha, 77.5%		

5.2.4 Fauna Records

The basic terrestrial vertebrate fauna survey recorded a total of eight fauna species from seven families, comprising seven birds, and one mammal.

A list of fauna species recorded during the field survey is presented in Table 11, including the number of times each species was recorded. Fauna record locations are shown in Figure 11.

A full list of fauna species recorded for the Project Area is present in Appendix J.

Table 11: Vertebrate fauna species recorded during the survey effort.

Family	Scientific Name	Common Name	Abundance
Birds			
Artamidae	*Gymnorhina tibicen*	Australian Magpie	1
Cacatuidae	*Eolophus roseicapilla*	Galah	5
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike	3
Corvidae	*Corvus bennettii*	Little Crow	3
	Corvus coronoides	Australian Raven	1
Psittaculidae	*Barnardius zonarius*	Australian Ringneck	13
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail	3
Mammals			
Canidae	*Canis Lupis**	Dingo / Dog*	1

5.2.5 Significant Fauna

No fauna species of significance (Threatened or Priority), or evidence of these species such as tracks, scats, nest, diggings, burrows or direct sightings were recorded within or directly surrounding the Survey Area.

The post survey results identified three significant taxa as having a high likelihood of occurrence within the Survey Area:

- Peregrine Falcon (*Falco peregrinus*), listed as Other Specially protected under the BC Act.
- Carnaby's Cockatoo (*Calyptorhynchus latirostris*), listed as Endangered under the BC Act and EPBC Act.
- Malleefowl (*Leipoa ocellata*), Listed as Vulnerable under the BC Act and EPBC Act.

Two significant taxa were identified as having a medium likelihood of occurrence within the Survey Area:

- Red-tailed Phascogale (*Phascogale calura*), Listed as Conservation Dependent under the BC Act and Vulnerable under the EPBC Act.
- Western Brush Wallaby (*Notamacropus irma*), DBCA listed as Priority 4.

A further 18 significant taxa were assessed as having a low likelihood of occurrence within the Survey Area. Further detail regarding recorded and potential significant fauna is provided below in Table 12.

Table 12: Likelihood of Occurrence Within the Survey Area

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
AVIAN											
Anatidae	*Oxyura australis*	Blue-billed Duck	P4	-			X			Low	The DBCA database identified three records withthin 80 km of the Survey Area, including two 30 km west in 2000 and one 80 km west in 1980[1]. No suitable habitat present in the Survey Area (densely vegetated freshwater lakes, swamps, dams)[2].
Ardeidae	*Ixobrychus dubius*	Australian Little Bittern, Black-backed Bittern	P4	-			X			Low	The DBCA database identified one record 70 km west the Survey Area in 1981[1]. No suitable habitat is present in the Survey Area (freshwater swamps, lakes, and rivers with dense beds of *Baumea*, *Typha* and other tall rushes)[3].
Cacatuidae	*Cacatua pastinator pastinator*	Muir's Corella	CD	-			x			Low	The DBCA database identified three records within 80 km of the Survey Area, including 42 km southwest in 1973 and 1977[1]. Suitable habitat is present within the Survey Area (wheat and sheep farming country, with

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											remnant native forest, woodland, scrub, sandplain heath)[4].
Cacatuidae	*Zanda baudinii*	Baudin's Cockatoo	EN	EN			x			Low	The DBCA database identified one record 47 km northwest of the Survey Area in 2004. This was a vouchered specimen and can be considered a confirmed ID[1]. Suitable habitat is present within the Survey Area (forests, farm trees; feeds on Marri and wood-boring insects)[2].
Cacatuidae	*Zanda latirostris*	Carnaby's Cockatoo	EN	EN		x	x			High	The DBCA database identified 31 records within 80 km of the Survey Area, including 14 km north in 2013 and 80 km north in 2018[1]. Suitable habitat is present within the Survey Area (forests, woodlands, heathlands, farms; feeds on *Banksias, Hakeas*, and pine plantations)[2].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
Falconidae	*Falco peregrinus*	Peregrine Falcon	OS	-			x			High	The DBCA database identified 31 records within 80 km of the Survey Area, including 24 km southeast in 2011 and 68 km south in 2015[1]. No suitable nesting habitat is present within the Survey Area (most environments with suitable nest sites: cliff faces preferred, including man-made ones, commonly uses stick nests built by other species)[5]. Will likely use the Survey Area for hunting.
Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU		X	x			High	The DBCA database identified 436 records within 80 km of the Survey Area, including 2 km north at an unspecified date and 12 km east in 2017[1]. Suitable habitat is present within the Survey Area (unburned mallee and woodland with abundant litter and low scrub)[2].
Psittaculidae	*Pezoporus wallicus flaviventris*	Western Ground Parrot	CR	CR			x			Low	The DBCA database identified one historic record 80 km north of the Survey Area[1]. No suitable habitat is present in the Survey Area - It occurs mostly in coastal heathland or sedgeland with very dense cover and a high density of the parrot's food plants[6].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
Psittaculidae	*Platycercus icterotis xanthogenys*	Western Rosella	P4	-			x			Low	The DBCA database identified four records within 80 km of the Survey Area, including 20 km southeast in 2008 and 22 km southeast in 1982[1]. Suitable habitat is present within the Survey Area (salmon gum and wandoo woodlands, farmlands; less common in heavy wet Karri and Jarrah; scarce on sandy west coastal plain)[5].
Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	CR	CR, MI, MA (overfly marine area)		X	x			Low	The DBCA database identified one record 35 km south of the Survey Area in 2001[1]. No suitable habitat is present in the Survey Area (inter-tidal mudflats of estuaries, lagoons, mangrove channels, dams, floodwaters, flooded saltbush surrounds of inland lakes)[2].
Strigidae	*Ninox connivens connivens*	Barking Owl	P3 (southwest subpop.)	-			x			Low	The DBCA database identified one record within 65 km east of the Survey Area in 1968[1]. Suitable habitat is present within the Survey Area (forests and woodlands with large old hollow bearing trees for nesting)[5]. This Subspecies is isolated from the eastern and northern populations and there are currently no sound recordings or photographs of wild populations[7].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
MAMMALIAN											
Dasyuridae	*Dasyurus geoffroii fortis*	Western Quoll, Chuditch	VU	VU		x	x			Low	The DBCA database identified 13 records within 80 km of the Survey Area, including 22 km southeast in 1972 and 58 km northeast in 2016[1]. No suitable habitat is present in the Survey Area (sclerophyll forest or drier woodland, heath and mallee shrubland)[8].
Dasyuridae	*Phascogale calura*	Red-tailed Phascogale, Kenngoor	CD	VU		x	x			Medium	The DBCA database identified 96 records within 80 km of the Survey Area, including 14 km north in 1990 and 12 km north in 2015[1]. These records are from Wadderin Wildlife Sanctuary and does not accurately represent the abundance of this species within the Survey Area. Suitable habitat is present within the Survey Area (*Allocasuarina* woodlands with hollow-containing eucalypts (eg *Eucalyptus wandoo*) and *Gastrolobium* spp.; prefers vegetation not burnt for at least 20 years)[8].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
Macropodidae	*Lagostrophus fasciatus fasciatus*	Banded Hare-wallaby, Mernine	VU	VU			x			Low	The DBCA database identified 10 records within 80 km of the Survey Area, including 12 km north in 2015 and 14 km north in 2018[1]. These records are from Wadderin Wildlife Sanctuary, this species does not naturally occur within this landscape anymore. Suitable habitat is present within the Survey Area - Common among dense thickets of *Acacia* and *Alectryon* scrub on the sandplains, and *Diplolaena* and *Acacia* on the dunes[5].
Macropodidae	*Notamacropus eugenii derbianus*	Tammar Wallaby	P4	-			x			Low	The DBCA database identified 28 records within 80 km of the Survey Area, including 40 km north in 2013 and 55 km southwest in 1999[1]. No suitable habitat is present in the Survey Area (coastal scrub, heath, dry sclerophyll forest and thickets in mallee and woodland)[8].
Macropodidae	*Notamacropus irma*	Western Brush Wallaby	P4	-			x			Medium	The DBCA database identified 13 records within 80 km of the Survey Area, including 19 km south in 1977 and 67 km southeast in 2011[1]. Suitable habitat is present within the Survey

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											Area (open forest and woodland, open seasonally wet flats)[8].
Macropodidae	*Petrogale lateralis lateralis*	Black-footed Rock-wallaby	EN	EN			x			Low	The DBCA database identified 520 records within 80 km of the Survey Area, including 44 km west in 1969 and 69 km west in 2014[1]. No suitable habitat is present in the Survey Area (shelters in rock crevices and caves; feeds on grasses and forbs)[9]. Not often found far from rocky outcrops, of which there are none close to the Survey Area.
Muridae	*Pseudomys occidentalis*	Western Mouse	P4	-			x			Low	The DBCA database identified 48 records within 80 km of the Survey Area, including 20 km south in 1975 and 21 km southeast in 1993[1]. No suitable habitat is present in the Survey Area (patches of extremely dense vegetation within sparse low shrubland, tall dense shrubland, sparse to dense shrub mallee and mid-dense woodland; prefers long unburnt habitat (between 30 and 50 years) on sandy clay loam or sandy loam)[8].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
Muridae	*Pseudomys shortridgei*	Heath Mouse, Dayang	VU	EN			x			Low	The DBCA database identified one record 68 km southeast of the Survey Area in 2018[1]. No suitable habitat is present in the Survey Area (taller scrubland associated with mallee trees and climax heath assemblages in undisturbed areas)[9].
Myrmecobiidae	*Myrmecobius fasciatus fasciatus*	Numbat, Walpurti	EN	EN			X			Low	The DBCA database identified 18 records within 80 km of the Survey Area, including 45 km southwest in 1970 and 66 km south in 1983[1]. No suitable habitat is present in the Survey Area (Jarrah forests, Wandoo woodlands; requires hollow logs and branches for shelter and termites for food)[8].
Peramelidae	*Isoodon fusciventer*	Quenda	P4	-			x			Low	The DBCA database identified 18 records within 80 km of the Survey Area, including 12 km north in 2018 and 14 km north in 2011[1]. These records are from Wadderin Wildlife Sanctuary, this species does not naturally occur within the landscape anymore. Suitable habitat is present in the Survey Area (sandy soils with dense heathy vegetation)[8].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
Potoroidae	*Bettongia penicillata ogilbyi*	Brush-tailed Bettong, Woylie	CR	EN (as B. penicillata ogilbyi)			x			Low	The DBCA database identified 26 records within 80 km of the Survey Area, including 14 km north in 2018 and 14 km north in 2016[1]. These records are from Wadderin Wildlife Sanctuary, this species does not naturally occur within this landscape anymore. No suitable habitat is present in the Survey Area (areas dominated by *Gastrolobium* thickets)[8].
Thylacomyidae	*Macrotis lagotis*	Bilby, Dalgyte	VU	VU			x			Low	The DBCA database identified 21 historic records within 80 km of the Survey Area, including 15 km southeast in 1957 and 32 km south in 1967[1]. No suitable habitat is present in the Survey Area (Mitchell grass and stony downs country of cracking clays, desert sandplains and dune fields sometimes containing laterite, hummock grassland and massive red earths with *Acacia* shrubland)[8].

1 – Department of Biodiversity, Conservation, and Attractions, 2023. 2 – Morcombe, 2003. 3 – Johnstone & Storr, 1998. 4 – Pizzey & Knight, 2001. 5 – Menkhorst, et al., 2017. 6 – Higgins, 1999. 7 – Davis, et al., 2022. 8 – Van Dyck & Strahan, 2008. 9 – Menkhorst & Knight, 2011.

5.2.6 Black Cockatoo Assessment

5.2.6.1 Desktop Assessment

The Survey Area occurs within the modelled distribution of the Carnaby's Cockatoo but is outside the modelled distribution of the Baudin's Cockatoo and Forest Red-tailed Black Cockatoo (DAWE, 2022b). The DBCA database search identified 31 Carnaby's Cockatoos and 11 'White-tailed Black Cockatoos', which we can assume are Carnaby's Cockatoos, were recorded within a 80 km radius of the Survey Area (Department of Biodiversity Conservation and Attractions, 2022a). One Baudin's Cockatoo was identified, but given it is unlikely to occur within this area it is likely a mistaken Carnaby's Cockatoo.

The DBCA database search identified one confirmed white-tailed black cockatoo nesting site 60 km from the Survey Area (Figure 10) (Department of Biodiversity Conservation and Attractions, 2022a).

The DBCA database search results show no confirmed Carnaby's Cockatoo roost sites within an 80 km radius of the Survey Area (Department of Biodiversity Conservation and Attractions, 2022a).

5.2.6.2 Black Cockatoo Observations

No black cockatoos, or evidence of, were recorded either inside the Survey Area or flying overhead during the field survey.

5.2.6.3 Nesting Habitat

The black cockatoo habitat assessment identified 26 potential nesting trees with a DBH greater than 500 mm present in the Survey Area (Figure 12), comprising:

- Nine Black Morrel (*Eucalyptus melanoxylon*)
- Four Merrit (*Eucalyptus urna*)
- Five Salmon Gums (*Eucalyptus salmonophloia*)
- Two Wandoo (*Eucalyptus wandoo subsp. wandoo*)
- Six Yorrel (*Eucalyptus yilgarnensis*).

One tree was found to contain two hollows which were suitable for black cockatoo nesting (Figure 12). Internal hollow inspections to determine occupancy or previous use by black cockatoos was not included in the scope of works for project.

5.2.6.4 Night Roosting Habitat

No direct sightings of roosting black cockatoos were made during the survey. All 26 trees recorded as potential nesting trees may also be suitable for roosting (Figure 12).Foraging Habitat

A total of approximately 20.5 ha of low quality Carnaby's Cockatoo foraging habitat was recorded, comprising native shrubland dominated by proteaceous plant species (*Banksia*, *Hakea*, and *Grevillea* species) as well as native eucalypt species (*E. wandoo, E. patens, E. loxophleba, E. salmonophloia*) (Figure 10). The results of the foraging quality scores are calculated using criteria from the *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022b) and are summarised in Table 13.

Table 13: Foraging habitat scoring tool.

Species	Starting Habitat Score	Foraging Potential	Connectivity	Proximity to Breeding	Proximity to Roosting	Impact from Disease	Total Score	Quality
Carnaby's Cockatoo	10	-2	0	-2	-2	0	4	Low

6.0 Discussion for the Northern Survey Area

6.1 Flora and Vegetation

6.1.1 Flora Composition

The suite of flora taxa recorded during the survey is considered typical for the Merredin (AVW01) subregion and aligns with the database search results obtained.

Despite the below-average rainfall recorded for the three months prior to commencing the survey, and a particularly dry May, the perennial floristic diversity was considered within the expected range for the bioregion for the timing of the survey undertaken. The lower than average rainfall preceding the survey is likely to have reduced the annual and ephemeral flora observed.

6.1.2 Survey Adequacy

The flora and vegetation survey effort was completed in accordance with the EPA Technical Guidance (EPA, 2016) for a reconnaissance level flora and vegetation survey within the South-West Botanical Province, and was appropriate for the scope of works given the level of disturbance and the linear nature of the Survey Area. The inventory of vascular flora was compiled using site data and opportunistic observations while traversing the Survey Area and undertaking the assessment of 4 relevés and 22 map notes. The entire Survey Area was not systematically searched, and therefore additional flora taxa, and records of significant flora and weed species may be recorded with additional survey effort.

6.1.3 Flora of Significance

No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened Flora pursuant to the BC Act 2016 were identified by the database searches or recorded within the Survey Area. No Priority species as listed by DBCA were recorded within the Survey Area.

The review of the database searches identified 70 significant flora as potentially occurring within 40km of the Survey Area. Of these, four are classed as Threatened by the State and also listed under the EBPC Act, 10 are listed as Priority 1, 13 as Priority 2, 34 as Priority 3 and 9 as Priority 4.

Prior to the survey, seven species were considered to have a high likelihood of occurrence, and 22 additional species were considered to have a medium likelihood of occurrence. Following the survey, *Daviesia nudiflora* subsp. *drummondii* was considered to have a 'medium' likelihood of occurrence within the Survey Area, and all 22 additional species were downgraded to 'low', based on the intensity of survey applied, and close inspection of suitable habitats.

6.1.4 Introduced Flora

Seven weed species were recorded in the Survey Area; however, none are listed as WoNS or DPs. All weed species recorded have a legal status of Permitted – s11, and do not have an assigned control category.

Weed species richness and abundance was greatest along roadsides and in previously cleared areas. The survey was undertaken after a period of below average rainfall, and the Survey Area was not systematically grid searched. Additional weed species and abundance could be recorded following significant rainfall and with greater survey effort.

6.1.5 Vegetation Types

Mapping reliability was high as the Survey Area was able to be walked in its entirety.

Five natural vegetation types, and two modified vegetation types, were described and mapped across one broad landform (plains).

Four of the five vegetation types (EsEsCh, EyCh, ElCh and EmEuEw) were dominated by *Eucalyptus* woodlands over a mixture of Chenopod shrubs and native and introduced grass species, with ElCh being the most common within the Survey Area (0.41 ha, 4.53%).

The MyHe vegetation type was encountered on the extremities of the Survey Area boundary and represented a heathland of various shrub species from the Myrtaceae family.

A significant portion of the survey area (1.11 ha, 12.23%) was mapped as the RE vegetation type, which represented planted, revegetated, or naturally regenerated patches of vegetation, particularly along roadsides.

The Parkland Cleared (PC) vegetation type represented roadside areas where native vegetation structure was absent, however occasional native shrubs and grasses were present. These areas were dominated by common agricultural weeds and represented 40.96% (3.72 ha) of the Survey Area.

6.1.6 Vegetation Condition

Within the entirety of the survey area, vegetation condition ranged from Completely Degraded to Very Good-Good, with the majority (3.72 ha) of vegetation considered to be in Completely Degraded condition, reflecting the modified nature of the roadside landscape, represented by the Parkland Cleared (PC) vegetation type.

The five natural vegetation types ranged in vegetation condition from Degraded to Very Good-Good, with the majority classified as Good condition.

No vegetation within the survey area was considered to have a 'Pristine' condition ranking, and areas mapped as the 'RD' vegetation type (representing Bitumen Roads) were automatically assigned the 'Cleared' vegetation condition ranking.

Dense patches of herbaceous weed species occurred through the entirety of the survey area along roadsides and cleared areas, and no attempt was made to catalogue the full suite of introduced species encountered.

6.1.7 Vegetation of Significance

No State or Commonwealth listed TECs were previously identified within the Survey Area by the database searches. The nearest previously recorded occurrence of the Eucalypt Woodland TEC, is located 5.8km south-east of the Survey Area (see Section 5.1.2, Figure 9):

The Eucalypt Woodlands TEC and its equivalent DBCA-listed PEC was confirmed as occurring at several locations of remnant vegetation within the Survey Area, as a result of 10 in situ field patch assessments and consideration against key diagnostic criteria (see Appendix F).

A patch is a discrete and mostly continuous area of the ecological community, which may include small-scale gaps (<50 m), given the generally open nature of the tree canopy. As the vegetation occurred along roadsides, a minimum patch width of 5m is applied. The width is based on the native understorey component rather than width of the tree canopy (DEE, 2015).

A total of 6 remnant vegetation patches represented by the EsEsCh and EmEuEw vegetation types were considered to be representative of the Eucalypt Woodlands TEC, totalling 0.27 ha (2.97%) of the Survey Area.

Four of the 10 patches did not fit the criteria and/or possessed one or more of the contra-indicators outlined in the Approved Conservation Advice (see Table 5):

- Patches 7 and 8, represented by the EyCh vegetation type, did not meet the criteria for assessment against condition thresholds due to *Eucalyptus yilgarnensis* being the dominant Eucalypt species. This taxa occurs as a mallee growth form and is not considered part of the Eucalypt Woodlands TEC (DEE, 2015).
- Patches 9 and 10, represented by the ElCh vegetation type, did not meet the criteria for assessment against condition thresholds due to *Eucalyptus loxophleba* subsp. *lissophloia* being the dominant Eucalypt species. This taxa occurs as a mallee growth form and is not considered part of the Eucalypt Woodlands TEC. Only stands dominated by subspecies loxophleba are included in the WA Wheatbelt Woodlands ecological community (DEE, 2015).

6.2 Vertebrate Fauna

6.2.1 Fauna Habitat

The fauna habitats identified in the Survey Area appears to be common in the immediate vicinity of the Survey Area and is typical of the vegetation within the Avon Wheatbelt and Mallee bioregions and the Merredin (AVW01) and Western Mallee (MAL02) subregions. The Merredin (AVW01) subregion is characterised as having mixed eucalypts, Allocasuarina huegeliana, and Jam-York Gum woodlands on quaternary alluvial and colluvial soils. The Western Mallee (MAL02) subregion is characterised as having mallee over myrtaceous-proteaceous heaths on duplex soils.

It is possible that significant fauna species such as the Red-tailed Phascogale and Malleefowl occur within the Survey Area, but it is unlikely that they are reliant on these habitats as they are found in the broader region outside the Survey Area. Significant bird species such as Carnaby's Cockatoo may also use the Survey Area for foraging and are likely to use it for breeding as there are suitable nesting hollows present. Peregrine Falcon may also use the Survey Area for hunting.

6.2.2 Significant Fauna

6.2.2.1 High Likelihood of Occurrence Within the Survey Area

Peregrine Falcon (*Falco peregrinus*)

The Peregrine Falcon is an uncommon but wide-ranging bird across Australia (Barrett et al., 2003). It occurs mainly along rivers and ranges as well as wooded watercourses and lakes. It nests primarily on cliffs, granite outcrops and quarries, although is also known to occupy existing raptor and corvid stick nests (Menkhorst et al., 2017). The diet of the Peregrine Falcon has been well studied and primarily includes flocking species such as parrots, pigeons and on the east coast, European Starlings (Olsen & Fuentes, 2008).

The Peregrine Falcon was not recorded within the Survey Area, however, there are 31 DBCA records nearby. The Peregrine Falcon typically nests on cliff ledges or in refurbished nests built by other raptors or corvids (Pizzey & Knight, 2013) which are not present within the Survey Area. All habitats within the Survey Area may be used for hunting and are likely contain preferred prey species.

Malleefowl (*Leipoa ocellata*)

The Malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or Acacia. A sandy substrate and abundance of leaf litter are required for breeding (DEE, 2018). Densities of the birds are generally greatest in areas of higher rainfall and on more fertile soils where habitats tend to be thicker and there is an abundance of food plants. Much of the best habitat for Malleefowl has already been cleared or has been modified by grazing via Sheep, Cattle, Rabbits and Goats (Benshemesh, 2007). The species nests in large mounds of dirt and leaf litter, up to five metres wide and one metre tall (Menkhorst et al., 2017).

The Malleefowl was not recorded within the Survey Area, however, there are 436 DBCA records nearby. The Malleefowl typically builds large mound nests in dense heathland habitats, which is present in a small area within the middle of the Survey Area. As this habitat is also found in large areas outside the Survey Area this species is not likely to be dependent on the habitats within the Survey Area.

6.2.2.2 Medium Likelihood of Occurrence Within the Survey Area

Red-tailed Phascogale (*Phascogale calura*)

The red-tailed Phascogale was previously found in woodland habitats throughout inland and central Australia but is now restricted to remnants of mature Wandoo or Rock oak woodlands in the southern Western Australian wheatbelt region where annual rainfall is 300 – 600 mm (Menkhorst & Knight, 2010).

The Red-tailed Phascogale was not recorded within the Survey Area, however, there are 96 DBCA records nearby. Most of these records are from Wadderin Wildlife Sanctuary and should

not be considered actual records, however, this is a species that is not easily contained by fences and some individuals may be prevalent in the surrounding area. The preferred habitat of this species is found within the Survey Area.

Western Brush Wallaby (*Notamacropus irma*)

The Western Brush Wallaby occurs only in the south-west of Western Australia and closely resembles a larger kangaroo (Van Dyck & Strahan, 2008). It has an optimum habitat of open forest or woodland, particularly favoring open and seasonally wet flats with low grasses and open scrubby thickets (Van Dyck & Strahan, 2008). The Western Brush Wallaby was a common species during the early days of settlement, however, ongoing clearing and fragmentation of bushland in the Wheatbelt as well as the dramatic increase in fox numbers within the south-west of Western Australia has led to this species' decline (Van Dyck & Strahan, 2008).

The Western Brush Wallaby was not recorded within the Survey Area, however, there are 13 records nearby. This species prefers open forest woodland habitats which are present within the Survey Area.

6.3 Black Cockatoo Assessment

The Survey Area occurs within the modelled breeding range of the Carnaby's Cockatoo but is outside the occurrence range of the Forest Red-tailed Black Cockatoo and Baudin's Cockatoo. The Carnaby's Cockatoo has multiple records nearby which means there is a high likelihood that this species may use the foraging and nesting habitats within the Survey Area.

6.3.1 Nesting Habitat

The field survey recorded a total of 26 potential nesting trees, one of which had two hollows that are potentially suitable for black cockatoo nesting. Hollow inspections were not included in the scope of works and were not carried out to confirm or rule out whether there was any current or previous use by black cockatoos. Given the presence of a confirmed Carnaby's Cockatoo breeding area within 60 km of the Survey Area, these hollows have the potential to be used by Carnaby's Cockatoos in the future (DAWE, 2022b).

6.3.2 Night Roosting Habitat

A total of 26 roosting trees (tall trees regardless of species) were recorded within the Survey Area. The DBCA database search results indicate that no known Carnaby's Cockatoo roosting site occurs within 80 km of the Survey Area. There are also several watering points around the Survey Area which may be utilised by black cockatoos during roosting.

6.3.3 Foraging Habitat

The foraging habitat within the Survey Area was identified as Banksia and Eucalypt woodland and was calculated to be of low-quality for both Carnaby's Cockatoo using the foraging habitat scoring tool in the Referral guideline for 3 WA threatened black cockatoo species (DAWE, 2022b). Evidence of foraging (feeding debris) was not found inside the Survey Area.

7.0 Results for the Southern Survey Area

7.1 Flora and Vegetation

7.1.1 Literature Review

The key findings of the flora and vegetation reports reviewed are summarised in Appendix B.

7.1.2 Database Searches

Database and literature review searches identified 130 significant flora species occurring within 40 km of the Survey Area (Figure 9), comprising:

- 16 Threatened species
- 14 Priority 1 species
- 20 Priority 2 species
- 64 Priority 3 species
- 16 Priority 4 species

One Commonwealth TEC, which is also a State-listed Priority PEC, has been identified as occurring within the Survey Area (Figure 6):

- Eucalypt Woodlands of the Western Australian Wheatbelt (DBCA: Priority 3) (EPBC: Critically Endangered).

7.1.3 Likelihood of Occurrence

The pre-survey likelihood of occurrence assessment identified that of the 67 significant flora species identified by the desktop assessment:

- None had previously been recorded within the Survey Area
- Four were considered to have a high likelihood of occurrence
- 23 were considered to have a medium likelihood of occurrence
- 40 were considered to have a low likelihood of occurrence.

Following the survey, the likelihood of occurrence assessment identified that:

- No significant flora taxa were recorded within the Survey Area
- No taxa were considered to have a high likelihood of occurrence
- No taxa were considered to have a medium likelihood of occurrence
- All 67 taxa were considered to have a low likelihood of occurrence.

The likelihood of occurrence assessment is provided in Appendix K.

7.1.4 Flora Composition

The survey recorded a total of 23 taxa from 18 genera across 9 families (Appendix D). The dominant families were Chenopodiaceae (6 species), Myrtaceae (5 species) and Poaceae (4 species). The most dominant genera was Eucalyptus (5 species).

7.1.5 Flora of Significance

7.1.5.1 Threatened or Priority Flora

No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened pursuant to the BC Act 2016 were recorded during the survey.

No Priority species as listed by DBCA were recorded within the Survey Area

7.1.5.2 Flora of Other Significance

Flora may be considered of other significance if it represents a range extension, novel taxon, species that play a keystone role in a community, has relic status, is locally endemic, or represents the extent of a species range. No taxa recorded from the Survey Area were considered to represent flora of other significance.

7.1.6 Introduced Flora

A total of five introduced species were recorded within the natural and modified vegetation remnants within the Survey Area, representing 21.7% of the total taxa recorded (**T**able 6). None of these five species are listed as either Declared Pests under the BAM Act (Department of Primary Industries and Regional Development, 2021), or as WoNS (Department of Agriculture Water and the Environment, 2021).

Introduced species are allocated an 'Ecological Impact' and an 'Invasiveness' ranking under the DBCA Weed Prioritisation Process for the Wheatbelt Region (DBCA, 2016). Of the five introduced species encountered in the survey area, two species are ranked High for Ecological Impact and Rapid for Invasiveness.

Introduced flora were common throughout modified areas, however no attempt was made to capture every taxa encountered, due to the extensive nature of these areas within the Survey Area, and its agricultural setting.

Table 14: Introduced Flora Recorded in the Survey Area and their ranking under the DBCA Weed Prioritization Process (DBCA, 2016).

Taxon	Common Name	Ecological Impact	Invasiveness	Declared BAM Act	WONS
**Bromus rubens*	Red Brome	H	R	Permitted - s11	No
**Erigeron bonariensis*	Flax-leaf Fleabane	-	-	Permitted - s11	No
**Poa annua*	Winter Grass	U	U	Permitted - s11	No
**Raphanus raphanistrum*	Wild Radish	U	R	Permitted - s11	No
**Romulea rosea*	Guildford Grass	H	R	Permitted - s11	No

7.1.7 Unconfirmed Flora

The majority (91.3%) of specimens recorded were identified to the lowest taxonomic level (Appendix D). Only two taxa were unconfirmed, but tentatively identified to species level: *Eriachne ?ovata* and *Eucalyptus ?eremophila.*

None of the unconfirmed flora taxa were analogous to Priority flora taxa identified by the database searches.

7.1.8 Vegetation Types

The natural and modified vegetation remnants identified during the survey accounted for 0.47 ha (48.6%) of the total Survey Area. Two natural vegetation types, and two modified vegetation types, were described and mapped across one broad landform (Table 14, Figure 13). Two additional mapping units were identified:

- **CL**: Cleared Areas; and
- **RD**: Bitumen Roads.

Detailed site sheets for each relevé are provided in Appendix L.

7.1.9 Vegetation Condition

Vegetation condition within the Survey Area predominantly ranged from Completely Degraded to Good, of the 0.47ha of natural and modified vegetation remnants assessed within the Survey Area (Figure 14), comprising:

- Good (0.18 ha / 39.15%)
- Degraded (0.01 ha / 1.91%)
- Completely Degraded (0.28 ha / 58.94%)

The remaining 0.5ha of the Survey Area comprised previously cleared or modified areas (eg roads and/or infrastructure) that were not assessed for vegetation condition (0.50 ha / 51.4%).

Evidence of disturbance included historical clearing for roads, infrastructure and agricultural activities, as well as weeds.

Table 15: Natural vegetation types recorded in the Southern Survey Area.

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Vegetation Condition	Photograph
EsEsCh: *Eucalyptus salmonophloia*, *E. ?eremophila, E. salubris (E. wandoo subsp. wandoo*) woodland over *Marieana brevifolia*, *Daviesia aphylla* and *Sclerolaeana diacantha* low sparse shrubland over *Eriachne ?ovata* and *Austrostipa elegantissima* low sparse grassland.	Gravelly Plain	0.12ha (12.62%)	NARR01	Good to Degraded	
EyCh: *Eucalyptus yilgarnensis* low woodland over Santalum acuminatum mid sparse shrubland over *Marieana brevifolia*, M. *suadifolia* and *Sclerolaeana diacantha* low sparse shrubland over *Austrostipa elegantissima* and *Eriachne ?ovata* low sparse grassland.	Gravelly Plain	0.07ha (6.72%)	NARR04	Good to Degraded	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Vegetation Condition	Photograph
RE: *Eucalyptus ?astringens*, *E. ?cylindriflora* and *E. torquata* woodland over *Acacia acuminata* tall sparse shrubland over *Melaleuca ?lanceolata* mid sparse shrubland over A. *hemiteles, Marieana brevifolia* and *Sclerolaeana diacantha* low sparse shrubland over **Poa annua* sparse low grassland.	Gravelly Plain	0.01ha (0.62%)	Map notes	Good	
PC: Vegetation no longer intact and the area is completely or almost completely without native species. Flora comprised of crop species, mixed introduced flora with some isolated native trees and shrubs.	Gravelly Plain	0.28ha (28.65%)	Map notes	Completely Degraded	

7.1.10 Vegetation of Significance

The Eucalypt Woodlands of the Western Australian Wheatbelt Commonwealth TEC (Eucalypt Woodlands TEC) and its equivalent DBCA-listed PEC, was expected to occur within the survey area, as previously identified by the DBCA database searches (see Section 7.1.2).

The Eucalypt Woodlands TEC was confirmed as occurring at several locations of remnant vegetation within the Survey Area, as a result of in situ field patch assessments and consideration against key diagnostic criteria (see Figure 15, and Appendix M for patch assessment).

A total of 5 remnant vegetation patches represented by the EsEsCh vegetation type were considered to be analogous to the Eucalypt Woodlands TEC, totalling 0.12 ha (12.37%) of the Survey Area.

7.1.11 Vegetation of Other Significance

Vegetation may be of significance for a range of reasons, other than a listing as a TEC or a PEC, including (Environmental Protection Authority, 2016a):

- Vegetation extent being below a threshold level
- Scarcity
- Unusual species
- Novel combinations of species
- A role as a refuge
- A role as a key habitat for threatened species or large populations representing a significant proportion of the local to regional total population of a species
- Being representative of the range of a unit (particularly a good local and/or regional example of a unit in ‘prime’ habitat, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range); and/or
- A restricted distribution.

No vegetation of other significance was recorded during the survey.

7.2 Vertebrate Fauna

7.2.1 Literature Review

The key findings of the literature review are summarised in Appendix G.

7.2.2 Database Searches

Database searches identified 40 terrestrial vertebrate fauna species potentially occurring within the Survey Area, comprising:

- 21 bird species
- 18 mammal species
- One reptile species

The results of the DBCA Threatened and Priority Fauna database search are mapped in Figure 10. Database searches are displayed in their entirety in Appendix H.

Species listed as Marine only under the EPBC Act, such as the as well as marine dependent species including the have been excluded from the likelihood of occurrence list as there is no marine habitat present within the Survey Area.

7.2.3 Fauna Habitat

One broad fauna habitat (excluding cleared areas) was identified and mapped within the Southern Survey Area (Figure 16). Habitat condition remained consistent throughout the Survey Area, with the most prolific disturbances being clearing for road verge and paddocks.

A description, extent within the Survey Area and a representative photo is provided for each fauna habitat in Tabe 16. Small discrepancies in fauna habitat extents (ie not adding up to the exact area extent of the Survey Area) are due to rounding. Fauna habitat mapping is presented in Figure 16 and site sheets for each habitat assessment are shown in Appendix I.

Table 16: Fauna Habitats Within the Survey Area

Fauna Habitat	Total Area, Proportion of the Survey Area	Habitat Description	Representative Photo
Trees over paddock	0.19 ha, 20%	Deep sandy loam plains throughout the landscape with remnant or planted eucalypt species over cleared paddock. Microhabitats include tree hollows, leaf litter, peeling bark, and woody debris that provide shelter for a wide range of various fauna species. The most important habitats are the various tree hollows which may provide suitable nesting habitat for black cockatoos. The largest disturbance was the clearing of native understorey for paddock that is still prolific throughout large portions of the Survey Area, as well as litter and weeds.	
Cleared	0.77 ha, 80%		

7.2.4 Fauna Records

The basic terrestrial vertebrate fauna survey recorded a total of five fauna species from four families, comprising four birds, and one reptile.

A list of fauna species recorded during the field survey is presented in Table 17, including the number of times each species was recorded. Fauna record locations are shown in Figure 16.

A full list of fauna species recorded for the Project Area is present in Appendix J.

Table 17: Vertebrate fauna species recorded during the survey effort.

Family	Scientific Name	Common Name	Abundance
Birds			
Acanthizidae	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	5
	Smicrornis brevirostris	Weebill	10
Falconidae	*Falco cenchroides*	Nankeen Kestrel	1
Psittaculidae	*Barnardius zonarius*	Australian Ringneck	1
Reptiles			
Gekkonidae	*Gehyra variegata*	Variegated Gehyra	1

7.2.5 Significant Fauna

No fauna species of significance (Threatened or Priority), or evidence of these species such as tracks, scats, nest, diggings, burrows or direct sightings were recorded within or directly surrounding the Survey Area.

The post survey results identified Two significant taxa as having a high likelihood of occurrence within the Survey Area:

- Peregrine Falcon (*Falco peregrinus*), listed as Other Specially protected under the BC Act.
- Carnaby's Cockatoo (*Calyptorhynchus latirostris*), listed as Endangered under the BC Act and EPBC Act.

No significant taxa were identified as having a medium likelihood of occurrence within the Survey Area, and a further 21 significant taxa were assessed as having a low likelihood of occurrence within the Southern Survey Area. Further detail regarding recorded and potential significant fauna is provided below in Table 18.

Table 18: Likelihood of Occurrence Within the Survey Area

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
AVIAN											
Anatidae	*Oxyura australis*	Blue-billed Duck	P4	-			X			Low	The DBCA database identified three records within 80 km of the Survey Area, including two 30 km west in 2000 and one 80 km west in 1980[1]. No suitable habitat is present in the Survey Area (densely vegetated freshwater lakes, swamps, dams)[2].
Ardeidae	*Ixobrychus dubius*	Australian Little Bittern, Black-backed Bittern	P4	-			X			Low	The DBCA database identified one record 70 km west the Survey Area in 1981[1]. No suitable habitat is present in the Survey Area (freshwater swamps, lakes and rivers with dense beds of *Baumea*, *Typha* and other tall rushes)[3].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Cacatuidae	*Cacatua pastinator pastinator*	Muir's Corella	CD	-			x			Low	The DBCA database identified three records within 80 km of the Survey Area, including 42 km southwest in 1973 and 1977[1]. Suitable habitat is present within the Survey Area (wheat and sheep farming country, with remnant native forest, woodland, scrub, sandplain heath)[4].
Cacatuidae	*Zanda baudinii*	Baudin's Cockatoo	EN	EN			x			Low	The DBCA database identified one record 47 km northwest of the Survey Area in 2004. This was a vouchered specimen and can be considered a confirmed ID[1]. Suitable habitat is present within the Survey Area (forests, farm trees; feeds on Marri and wood-boring insects)[2].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Cacatuidae	*Zanda latirostris*	Carnaby's Cockatoo	EN	EN		x	x			High	The DBCA database identified 31 records within 80 km of the Survey Area, including 14 km north in 2013 and 80 km north in 2018[1]. Suitable habitat is present within the Survey Area (forests, woodlands, heathlands, farms; feeds on *Banksias, Hakeas*, and pine plantations)[2].
Falconidae	*Falco peregrinus*	Peregrine Falcon	OS	-			x			High	The DBCA database identified 31 records within 80 km of the Survey Area, including 24 km southeast in 2011 and 68 km south in 2015[1]. No suitable nesting habitat is present within the Survey Area (most environments with suitable nest sites: cliff faces preferred, including man-made ones, commonly uses stick nests built by other species)[5]. Will likely use the Survey Area for hunting.

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU		X	x			Low	The DBCA database identified 436 records within 80 km of the Survey Area, including 18 km north at an unspecified date and 12 km east in 2017[1]. No suitable habitat is present within the Survey Area (unburned mallee and woodland with abundant litter and low scrub)[2].
Psittaculidae	*Pezoporus wallicus flaviventris*	Western Ground Parrot	CR	CR			x			Low	The DBCA database identified one historic record 80 km north of the Survey Area[1]. No suitable habitat is present in the Survey Area - It occurs mostly in coastal heathland or sedgeland with very dense cover and a high density of the parrot's food plants[6].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Psittaculidae	*Platycercus icterotis xanthogenys*	Western Rosella	P4	-			x			Low	The DBCA database identified four records within 80 km of the Survey Area, including 20 km southeast in 2008 and 22 km southeast in 1982[1]. Suitable habitat is present within the Survey Area (salmon gum and wandoo woodlands, farmlands; less common in heavy wet Karri and Jarrah; scarce on sandy west coastal plain)[5].
Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	CR	CR, MI, MA (overfly marine area)		X	x			Low	The DBCA database identified one record 35 km south of the Survey Area in 2001[1]. No suitable habitat is present in the Survey Area (inter-tidal mudflats of estuaries, lagoons, mangrove channels, dams, floodwaters, flooded saltbush surrounds of inland lakes)[2].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Strigidae	*Ninox connivens connivens*	Barking Owl	P3 (southwest subpop.)	-			x			Low	The DBCA database identified one record within 65 km east of the Survey Area in 1968[1]. Suitable habitat is present within the Survey Area (forests and woodlands with large old hollow bearing trees for nesting)[5]. This Subspecies is isolated from the eastern and northern populations and there are currently no sound recordings or photographs of wild populations[7].
MAMMALIAN											
Dasyuridae	*Dasyurus geoffroii fortis*	Western Quoll, Chuditch	VU	VU		x	x			Low	The DBCA database identified 13 records within 80 km of the Survey Area, including 22 km southeast in 1972 and 58 km northeast in 2016[1]. No suitable habitat is present in the Survey Area (sclerophyll forest or drier

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
											woodland, heath, and mallee shrubland)[8].
Dasyuridae	*Phascogale calura*	Red-tailed Phascogale, Kenngoor	CD	VU		x	x			Low	The DBCA database identified 96 records within 80 km of the Survey Area, including 30 km north in 1990 and 12 km north in 2015[1]. These records are from Wadderin Wildlife Sanctuary and does not accurately represent the abundance of this species within the Survey Area. No suitable habitat is present within the Survey Area (Allocasuarina woodlands with hollow-containing eucalypts (eg *Eucalyptus wandoo*) and *Gastrolobium* spp.; prefers vegetation not burnt for at least 20 years)[8].
Macropodidae	*Lagostrophus fasciatus fasciatus*	Banded Hare-	VU	VU			x			Low	The DBCA database identified 10 records within 80 km of the Survey Area, including 12 km

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
		wallaby, Mernine									north in 2015 and 14 km north in 2018[1]. These records are from Wadderin Wildlife Sanctuary, this species does not naturally occur within this landscape anymore. Suitable habitat is present within the Survey Area - Common among dense thickets of Acacia and Alectryon scrub on the sandplains, and Diplolaena and Acacia on the dunes[5].
Macropodidae	*Notamacropus eugenii derbianus*	Tammar Wallaby	P4	-			x			Low	The DBCA database identified 28 records within 80 km of the Survey Area, including 40 km north in 2013 and 55 km southwest in 1999[1]. No suitable habitat is present in the Survey Area (coastal scrub, heath, dry sclerophyll forest and thickets in mallee and woodland)[8].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Macropodidae	*Notamacropus irma*	Western Brush Wallaby	P4	-			x			Low	The DBCA database identified 13 records within 80 km of the Survey Area, including 19 km south in 1977 and 67 km southeast in 2011[1]. No suitable habitat is present within the Survey Area (open forest and woodland, open seasonally wet flats)[8].
Macropodidae	*Petrogale lateralis lateralis*	Black-footed Rock-wallaby	EN	EN			x			Low	The DBCA database identified 520 records within 80 km of the Survey Area, including 44 km west in 1969 and 69 km west in 2014[1]. No suitable habitat is present in the Survey Area (shelters in rock crevices and caves; feeds on grasses and forbs)[9]. Not often found far from rocky outcrops, of which there are none close to the Survey Area.

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Muridae	*Pseudomys occidentalis*	Western Mouse	P4	-			x			Low	The DBCA database identified 48 records within 80 km of the Survey Area, including 20 km south in 1975 and 21 km southeast in 1993[1]. No suitable habitat is present in the Survey Area (patches of extremely dense vegetation within sparse low shrubland, tall dense shrubland, sparse to dense shrub mallee and mid-dense woodland; prefers long unburnt habitat (between 30 and 50 years) on sandy clay loam or sandy loam)[8].
Muridae	*Pseudomys shortridgei*	Heath Mouse, Dayang	VU	EN			x			Low	The DBCA database identified one record 68 km southeast of the Survey Area in 2018[1]. No suitable habitat is present in the Survey Area (taller scrubland associated with mallee trees and climax heath assemblages in undisturbed areas)[9].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Myrmecobiidae	*Myrmecobius fasciatus fasciatus*	Numbat, Walpurti	EN	EN			X			Low	The DBCA database identified 18 records within 80 km of the Survey Area, including 45 km southwest in 1970 and 66 km south in 1983[1]. No suitable habitat is present in the Survey Area (Jarrah forests, Wandoo woodlands; requires hollow logs and branches for shelter and termites for food)[8].
Peramelidae	*Isoodon fusciventer*	Quenda	P4	-			x			Low	The DBCA database identified 18 records within 80 km of the Survey Area, including 12 km north in 2018 and 14 km north in 2011[1]. These records are from Wadderin Wildlife Sanctuary, this species does not naturally occur within the landscape anymore. Suitable habitat is present in the Survey Area (sandy soils with dense heathy vegetation)[8].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Potoroidae	*Bettongia penicillata ogilbyi*	Brush-tailed Bettong, Woylie	CR	EN (as B. penicillata ogilbyi)			x			Low	The DBCA database identified 26 records within 80 km of the Survey Area, including 14 km north in 2018 and 14 km north in 2016[1]. These records are from Wadderin Wildlife Sanctuary, this species does not naturally occur within this landscape anymore. No suitable habitat is present in the Survey Area (areas dominated by *Gastrolobium* thickets)[8].
Thylacomyidae	*Macrotis lagotis*	Bilby, Dalgyte	VU	VU			x			Low	The DBCA database identified 21 historic records within 80 km of the Survey Area, including 15 km southeast in 1957 and 32 km south in 1967[1]. No suitable habitat is present in the Survey Area (Mitchell grass and stony downs country of cracking clays, desert sandplains and dune fields sometimes containing laterite, hummock grassland and

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
											massive red earths with *Acacia* shrubland)[8].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
AVIAN											
Anatidae	*Oxyura australis*	Blue-billed Duck	P4	-			X			Low	The DBCA database identified three records within 80 km of the Survey Area, including two 30 km west in 2000 and one 80 km west in 1980[1]. No suitable habitat is present in the Survey Area (densely vegetated freshwater lakes, swamps, dams)[2].
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Cacatuidae	*Zanda baudinii*	Baudin's Cockatoo	EN	EN			x			Low	The DBCA database identified one record 47 km northwest of the Survey Area in 2004. This was a vouchered specimen and can be considered a confirmed ID[1]. Suitable habitat is present within the Survey Area (forests, farm trees; feeds on Marri and wood-boring insects)[2].

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Falconidae	*Falco peregrinus*	Peregrine Falcon	OS	-			x			High	The DBCA database identified 31 records within 80 km of the Survey Area, including 24 km southeast in 2011 and 68 km south in 2015[1]. No suitable nesting habitat is present within the Survey Area (most environments with suitable nest sites: cliff faces preferred, including man-made ones, commonly uses stick nests built by other species)[5]. Will likely use the Survey Area for hunting.

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			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
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Psittaculidae	*Pezoporus wallicus flaviventris*	Western Ground Parrot	CR	CR			x			Low	The DBCA database identified one historic record 80 km north of the Survey Area[1]. No suitable habitat is present in the Survey Area - It occurs mostly in coastal heathland or sedgeland with very dense cover and a high density of the parrot's food plants[6].

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			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Psittaculidae	*Platycercus icterotis xanthogenys*	Western Rosella	P4	-			x			Low	The DBCA database identified four records within 80 km of the Survey Area, including 20 km southeast in 2008 and 22 km southeast in 1982[1]. Suitable habitat is present within the Survey Area (salmon gum and wandoo woodlands, farmlands; less common in heavy wet Karri and Jarrah; scarce on sandy west coastal plain)[5].
Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	CR	CR, MI, MA (overfly marine area)		X	x			Low	The DBCA database identified one record 35 km south of the Survey Area in 2001[1]. No suitable habitat is present in the Survey Area (inter-tidal mudflats of estuaries, lagoons, mangrove channels, dams, floodwaters, flooded saltbush surrounds of inland lakes)[2].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Strigidae	*Ninox connivens connivens*	Barking Owl	P3 (southwest subpop.)	-			x			Low	The DBCA database identified one record within 65 km east of the Survey Area in 1968[1]. Suitable habitat is present within the Survey Area (forests and woodlands with large old hollow bearing trees for nesting)[5]. This Subspecies is isolated from the eastern and northern populations and there are currently no sound recordings or photographs of wild populations[7].
MAMMALIAN											
Dasyuridae	*Dasyurus geoffroii fortis*	Western Quoll, Chuditch	VU	VU		x	x			Low	The DBCA database identified 13 records within 80 km of the Survey Area, including 22 km southeast in 1972 and 58 km northeast in 2016[1]. No suitable habitat is present in the Survey Area (sclerophyll forest or drier

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
											woodland, heath, and mallee shrubland)[8].
Dasyuridae	*Phascogale calura*	Red-tailed Phascogale, Kenngoor	CD	VU		x	x			Low	The DBCA database identified 96 records within 80 km of the Survey Area, including 30 km north in 1990 and 12 km north in 2015[1]. These records are from Wadderin Wildlife Sanctuary and does not accurately represent the abundance of this species within the Survey Area. No suitable habitat is present within the Survey Area (Allocasuarina woodlands with hollow-containing eucalypts (eg *Eucalyptus wandoo*) and *Gastrolobium* spp.; prefers vegetation not burnt for at least 20 years)[8].
Macropodidae	*Lagostrophus fasciatus fasciatus*	Banded Hare-	VU	VU			x			Low	The DBCA database identified 10 records within 80 km of the Survey Area, including 12 km

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			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
		wallaby, Mernine									north in 2015 and 14 km north in 2018[1]. These records are from Wadderin Wildlife Sanctuary, this species does not naturally occur within this landscape anymore. Suitable habitat is present within the Survey Area - Common among dense thickets of Acacia and Alectryon scrub on the sandplains, and Diplolaena and Acacia on the dunes[5].
Macropodidae	*Notamacropus eugenii derbianus*	Tammar Wallaby	P4	-			x			Low	The DBCA database identified 28 records within 80 km of the Survey Area, including 40 km north in 2013 and 55 km southwest in 1999[1]. No suitable habitat is present in the Survey Area (coastal scrub, heath, dry sclerophyll forest and thickets in mallee and woodland)[8].

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			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Macropodidae	*Notamacropus irma*	Western Brush Wallaby	P4	-			x			Low	The DBCA database identified 13 records within 80 km of the Survey Area, including 19 km south in 1977 and 67 km southeast in 2011[1]. No suitable habitat is present within the Survey Area (open forest and woodland, open seasonally wet flats)[8].
Macropodidae	*Petrogale lateralis lateralis*	Black-footed Rock-wallaby	EN	EN			x			Low	The DBCA database identified 520 records within 80 km of the Survey Area, including 44 km west in 1969 and 69 km west in 2014[1]. No suitable habitat is present in the Survey Area (shelters in rock crevices and caves; feeds on grasses and forbs)[9]. Not often found far from rocky outcrops, of which there are none close to the Survey Area.

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
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Muridae	*Pseudomys occidentalis*	Western Mouse	P4	-			x			Low	The DBCA database identified 48 records within 80 km of the Survey Area, including 20 km south in 1975 and 21 km southeast in 1993[1]. No suitable habitat is present in the Survey Area (patches of extremely dense vegetation within sparse low shrubland, tall dense shrubland, sparse to dense shrub mallee and mid-dense woodland; prefers long unburnt habitat (between 30 and 50 years) on sandy clay loam or sandy loam)[8].
Muridae	*Pseudomys shortridgei*	Heath Mouse, Dayang	VU	EN			x			Low	The DBCA database identified one record 68 km southeast of the Survey Area in 2018[1]. No suitable habitat is present in the Survey Area (taller scrubland associated with mallee trees and climax heath assemblages in undisturbed areas)[9].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Myrmecobiidae	*Myrmecobius fasciatus fasciatus*	Numbat, Walpurti	EN	EN			X			Low	The DBCA database identified 18 records within 80 km of the Survey Area, including 45 km southwest in 1970 and 66 km south in 1983[1]. No suitable habitat is present in the Survey Area (Jarrah forests, Wandoo woodlands; requires hollow logs and branches for shelter and termites for food)[8].
Peramelidae	*Isoodon fusciventer*	Quenda	P4	-			x			Low	The DBCA database identified 18 records within 80 km of the Survey Area, including 12 km north in 2018 and 14 km north in 2011[1]. These records are from Wadderin Wildlife Sanctuary, this species does not naturally occur within the landscape anymore. Suitable habitat is present in the Survey Area (sandy soils with dense heathy vegetation)[8].

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
Potoroidae	*Bettongia penicillata ogilbyi*	Brush-tailed Bettong, Woylie	CR	EN (as B. penicillata ogilbyi)			x			Low	The DBCA database identified 26 records within 80 km of the Survey Area, including 14 km north in 2018 and 14 km north in 2016[1]. These records are from Wadderin Wildlife Sanctuary, this species does not naturally occur within this landscape anymore. No suitable habitat is present in the Survey Area (areas dominated by *Gastrolobium* thickets)[8].
Thylacomyidae	*Macrotis lagotis*	Bilby, Dalgyte	VU	VU			x			Low	The DBCA database identified 21 historic records within 80 km of the Survey Area, including 15 km southeast in 1957 and 32 km south in 1967[1]. No suitable habitat is present in the Survey Area (Mitchell grass and stony downs country of cracking clays, desert sandplains and dune fields sometimes containing laterite, hummock grassland and

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15	Field Survey		
											massive red earths with *Acacia* shrubland)[8].

1 – Department of Biodiversity, Conservation, and Attractions, 2023. 2 – Morcombe, 2003. 3 – Johnstone & Storr, 1998. 4 – Pizzey & Knight, 2001. 5 – Menkhorst, et al., 2017. 6 – Higgins, 1999. 7 – Davis, et al., 2022. 8 – Van Dyck & Strahan, 2008. 9 – Menkhorst & Knight, 2011.

7.3 Black Cockatoo Assessment

7.3.1 Desktop Assessment

The Survey Area occurs within the modelled distribution of the Carnaby's Cockatoo but is outside the modelled distribution of the Baudin's Cockatoo and Forest Red-tailed Black Cockatoo (DAWE, 2022b). The DBCA database search identified 31 Carnaby's Cockatoos and 11 'White-tailed Black Cockatoos', which we can assume are Carnaby's Cockatoos, were recorded within a 80 km radius of the Survey Area (Department of Biodiversity Conservation and Attractions, 2022a). One Baudin's Cockatoo was identified, but given it is unlikely to occur within this area it is likely a mistaken Carnaby's Cockatoo.

7.3.2 Black Cockatoo Observations

No black cockatoos, or evidence of, were recorded either inside the Survey Area or flying overhead during the field survey.

7.3.3 Nesting Habitat

The black cockatoo habitat assessment identified six potential nesting trees with a DBH greater than 500 mm which constitute potential nesting trees (Figure 17), comprising:

- Three Salmon Gums (Eucalyptus *salmonophloia*)
- Two Wandoo (Eucalyptus *wandoo subsp. wandoo*)
- One Merrit (Eucalyptus *urna*).

Two trees were found to contain multiple hollows (six total, three in each tree) which were suitable for black cockatoo nesting (Figure 17). Internal hollow inspections to determine occupancy or previous use by black cockatoos was not included in the scope of works for project.

7.3.4 Night Roosting Habitat

No direct sightings of roosting black cockatoos were made during the survey. All six trees recorded as potential nesting trees may also be suitable for roosting (Figure 17).

7.3.5 Foraging Habitat

A total of approximately 0.192 ha of low quality Carnaby's Cockatoo foraging habitat was recorded, comprising native eucalypt species (*E. salmonophloia, E. capillosa, E. urna*) (Figure 17). The results of the foraging quality scoring tool are calculated using criteria from the *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022b) and are summarised in Table 19.

Table 19: Foraging Habitat Scoring Tool

Species	Starting Habitat Score	Foraging Potential	Connectivity	Proximity to Breeding	Proximity to Roosting	Impact from Disease	Total Score	Quality
Carnaby's Cockatoo	10	-2	0	-2	-2	0	4	Low

8.0 Discussion for the Southern Survey Area

8.1 Flora and Vegetation

8.1.1 Flora Composition

The suite of flora taxa recorded during the survey is considered typical for the Western Mallee (MAL02) subregion and aligns with the database search results obtained.

Despite the below-average rainfall recorded for the three months prior to commencing the survey, and a particularly dry May, the perennial floristic diversity was considered within the expected range for the bioregion for the timing of the survey undertaken. The lower than average rainfall preceding the survey is likely to have reduced the annual and ephemeral flora observed.

8.1.2 Survey Adequacy

The flora and vegetation survey effort was completed in accordance with the EPA Technical Guidance (EPA, 2016) for a reconnaissance level flora and vegetation survey within the South-West Botanical Province, and was appropriate for the scope of works given the level of disturbance and the linear nature of the Survey Area. The inventory of vascular flora was compiled using site data and opportunistic observations while traversing the Survey Area and undertaking the assessment of 2 relevés and 11 map notes. The entire Survey Area was not systematically searched, and therefore additional flora taxa, and records of significant flora and weed species may be recorded with additional survey effort.

8.1.3 Flora of Significance

No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened Flora pursuant to the BC Act 2016 were identified by the database searches or recorded within the Survey Area. No Priority species as listed by DBCA were recorded within the Survey Area.

The review of the database searches identified 67 significant flora as potentially occurring within 40km of the Survey Area. Of these, 16 are classed as Threatened by the State and also listed under the EBPC Act, 14 as Priority 1, 20 as Priority 2, 64 as Priority 3 and 16 as Priority 4.

Prior to the survey, four species were considered to have a high likelihood of occurrence, and 23 additional species were considered to have a medium likelihood of occurrence. A post

likelihood of occurrence survey assessment resulted in all species being downgraded to low, based on the intensity of survey applied, and close inspection of suitable habitats.

8.1.4 Introduced Flora

Five weed species were recorded in the Survey Area; however, none are listed as WoNS or DPs. All weed species recorded have a legal status of Permitted – s11, and do not have an assigned control category.

Weed species richness and abundance was greatest along roadsides and in previously cleared areas. The survey was undertaken after a period of below average rainfall, and the Survey Area was not systematically grid searched. Additional weed species and abundance could be recorded following significant rainfall and with greater survey effort.

8.1.5 Vegetation Types

Mapping reliability was high as the Survey Area was able to be walked in its entirety.

Two natural vegetation types, and two modified vegetation types, were described and mapped across one broad landform (plains).

The EsEsCh vegetation type was the most common within the Survey Area (0.12 ha, 12.62%), and is dominated by *Eucalyptus salmonophloia, E. salubris* and/or *E. wandoo* subsp. *wandoo* woodlands over Chenopodiaceae shrubs and sparse native grasses.

The EyCh vegetation type was represented by *Eucalyptus yilgarnensis* woodlands over *Santalum acuminatum* mid sparse shrublands, with Chenopodiaceae shrubs and sparse native grasses, and 0.07 ha (6.72%) was mapped for the Survey Area.

A small portion of the survey area (0.01 ha, 0.62%) was mapped as the RE vegetation type, which represented planted, revegetated or naturally regenerated patches of vegetation, particularly along roadsides.

The Parkland Cleared (PC) vegetation type represented roadside areas where native vegetation structure was absent, however occasional native shrubs and grasses were present. These areas were dominated by common agricultural weeds and represented 28.65% (0.28 ha) of the Survey Area.

8.1.6 Vegetation Condition

Within the entirety of the survey area, vegetation condition ranged from Completely Degraded to Good, with the majority (0.28) ha) of assessed vegetation considered to be in Completely Degraded condition, reflecting the modified nature of the roadside landscape, represented by the Parkland Cleared (PC) vegetation type.

The two natural vegetation types ranged in vegetation condition from Degraded to Good, with the majority classified as Good condition.

No vegetation within the survey area was considered to have a ‘Pristine’ condition ranking, and areas mapped as the ‘RD’ vegetation type (representing Bitumen Roads) were automatically assigned the ‘Cleared’ vegetation condition ranking.

Dense patches of herbaceous weed species occurred through the entirety of the survey area along roadsides and cleared areas, and no attempt was made to catalogue the full suite of introduced species encountered.

8.1.7 Vegetation of Significance

The Eucalypt Woodlands of the Western Australian Wheatbelt Commonwealth TEC (Eucalypt Woodlands TEC) and its equivalent DBCA-listed PEC, was expected to occur within the survey area, as previously identified by the DBCA database searches (see Section 7.1.2).

The Eucalypt Woodlands TEC and its equivalent DBCA-listed PEC was confirmed as occurring at several locations of remnant vegetation within the Survey Area, as a result of 8 in situ field patch assessments and consideration against key diagnostic criteria (see Appendix M).

A patch is a discrete and mostly continuous area of the ecological community, which may include small-scale gaps (<50 m), given the generally open nature of the tree canopy. As the vegetation occurred along roadsides, a minimum patch width of 5m is applied. The width is based on the native understorey component rather than width of the tree canopy (DEE, 2015).

A total of 5 remnant vegetation patches represented by the EsEsCh vegetation type was considered to be representative of the Eucalypt Woodlands TEC, totalling 0.12 ha (12.37%) of the Survey Area.

Three of the eight patches did not fit the criteria and/or possessed one or more of the contra-indicators outlined in the Approved Conservation Advice (see Table 5):

- Patches 6, 7 and 8, represented by the EyCh vegetation type, did not meet the criteria for assessment against condition thresholds due to *Eucalyptus yilgarnensis* being the dominant Eucalypt species. This taxa occurs as a mallee growth form and is not considered part of the Eucalypt Woodlands TEC (DEE, 2015).

8.2 Vertebrate Fauna

8.2.1 Fauna Habitat

The fauna habitats identified in the Survey Area appears to be common in the immediate vicinity of the Survey Area and is typical of the vegetation within the Avon Wheatbelt and Mallee bioregions and the Merredin (AVW01) and Western Mallee (MAL02) subregions. The Merredin (AVW01) subregion is characterised as having mixed eucalypts, Allocasuarina huegeliana, and Jam-York Gum woodlands on quaternary alluvial and colluvial soils. The Western Mallee (MAL02) subregion is characterised as having mallee over myrtaceous-proteaceous heaths on duplex soils.

The significant bird species Carnaby's Cockatoo may use the Survey Area for foraging and are likely to use it for nesting as there are suitable nesting hollows present. Peregrine Falcon may also use the Survey Area for hunting.

8.2.2 Significant Fauna

8.2.2.1 High Likelihood of Occurring Within the Survey Area

Peregrine Falcon (*Falco peregrinus*)

The Peregrine Falcon is an uncommon but wide-ranging bird across Australia (Barrett et al., 2003). It occurs mainly along rivers and ranges as well as wooded watercourses and lakes. It nests primarily on cliffs, granite outcrops and quarries, although is also known to occupy existing raptor and corvid stick nests 5. The diet of the Peregrine Falcon has been well studied and primarily includes flocking species such as parrots, pigeons and on the east coast, European Starlings (Olsen & Fuentes, 2008).

The Peregrine Falcon was not recorded within the Survey Area, however, there are 31 DBCA records nearby. The Peregrine Falcon typically nests on cliff ledges or in refurbished nests built by other raptors or corvids (Pizzey & Knight, 2013) which are not present within the Survey Area. All habitats within the Survey Area may be used for hunting and are likely contain preferred prey species.

8.3 Black Cockatoo Assessment

The Survey Area occurs within the modelled breeding range of the Carnaby's Cockatoo but is outside the occurrence range of the Forest Red-tailed Black Cockatoo and Baudin's Cockatoo. The Carnaby's Cockatoo has multiple records nearby which means there is a high likelihood that this species may use the foraging and nesting habitats within the Survey Area.

8.3.1 Nesting Habitat

The field survey recorded a total of six potential nesting trees, two of which had multiple hollows (six total, three per tree) that are potentially suitable for black cockatoo nesting. Hollow inspections were not included in the scope of works and were not carried out to confirm or rule out whether there was any current or previous use by black cockatoos. Given the presence of a confirmed Carnaby's Cockatoo breeding area within 80 km of the Survey Area, these hollows have the potential to be used by Carnaby's Cockatoos in the future (DAWE, 2022b).

8.3.2 Night Roosting Habitat

A total of six roosting trees (tall trees regardless of species) were recorded within the Survey Area. The DBCA database search results indicate that no known Carnaby's Cockatoo roosting site occurs within 80 km of the Survey Area. There are also several watering points around the Survey Area which may be utilised by black cockatoos during roosting.

8.3.3 Foraging Habitat

The foraging habitat (0.192 ha) within the Survey Area was identified as Eucalypt woodland and was calculated to be of low-quality for Carnaby's Cockatoo using the foraging habitat scoring tool in the *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022b). Evidence of foraging (feeding debris) was not found inside the Survey Area.

9.0 Conclusion

9.1 Northern Survey Area (Kondinin – Narembeen Road SLK 19 to SLK 23)

Flora and Vegetation

- No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act 2016 were recorded during the survey
- No DBCA listed Priority flora were recorded.
- Seven introduced species were recorded during the survey. None of these represented WoNS or Declared Pests
- Five natural vegetation types were mapped within the Survey Area.
- Six remnant vegetation patches represented by the EsEsCh and EmEuEw vegetation types were considered to be analogous with the Eucalypt Woodlands TEC, totalling 0.27 ha.

Vertebrate Fauna

- Three fauna habitats were mapped, of which Eucalyptus Woodland represents the most value to significant fauna and overall fauna assemblages
- No significant fauna species were recorded during the fauna surveys
- Three significant species were recorded as having a high likelihood of occurrence within the Survey Area, Carnaby's Cockatoo (*Zanda latirostris*), Peregrine Falcon (*Falco peregrinus*), and Malleefowl (*Leipoa ocellata*).
- One introduced species was recorded during the survey, Dingo / Dog (*Canis lupis).*

Black Cockatoo

- A total of 26 trees with a DBH of greater than 500 mm were recorded
- One tree was found to contain two hollows that are potentially suitable for black cockatoo nesting
- A total of 20.5 ha of low-quality Carnaby's Cockatoo foraging habitat was recorded, which also constitutes roosting habitat.

9.2 Southern Survey Area (Kondinin – Narembeen Rd, Cheethams Rd, and South Kuminin Rd Intersection)

Flora and Vegetation

- No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act 2016 were recorded during the survey
- No DBCA listed Priority flora were recorded.

- Five introduced species were recorded during the survey. None of these represented WoNS or Declared Pests
- Two natural vegetation types were identified within the Survey Area.
- Six mapped areas representing five remnant vegetation patches represented by the EsEsCh vegetation type were considered to be analogous with the Eucalypt Woodlands TEC, totalling 0.12 ha.

Vertebrate Fauna

- One fauna habitat was mapped over the whole Survey Area, Trees Over Paddock
- No significant fauna species were recorded during the fauna surveys
- Two significant species were recorded as having a high likelihood of occurrence within the Survey Area, Carnaby's Cockatoo (*Zanda latirostris*), Peregrine Falcon (*Falco peregrinus*)
- No introduced species were recorded during the survey

Black Cockatoo

- A total of six trees with a DBH of greater than 500 mm were recorded
- Two trees were found to contain six hollows (three hollows in each tree) that are potentially suitable for black cockatoo nesting
- A total of 0.192 ha of low-quality Carnaby's Cockatoo foraging habitat was recorded, which also constitutes roosting habitat.

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Appendix A Figures

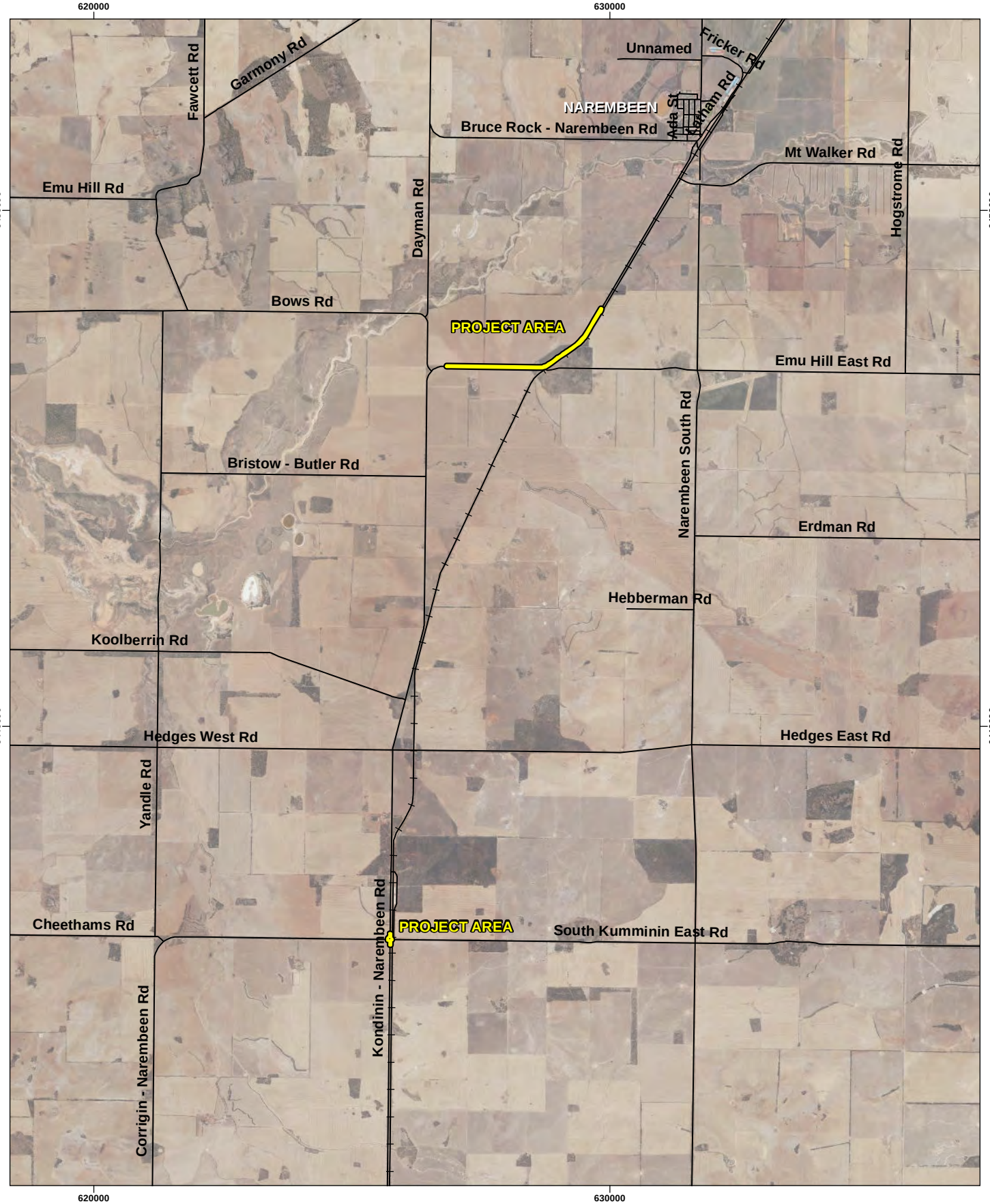
Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

SLR Project No.: 675.VX5781.00001

October 31, 2024



Legend

- Project Area
- Road
- Railway

- AERIAL PHOTOGRAPHY SOURCED LANDGATE

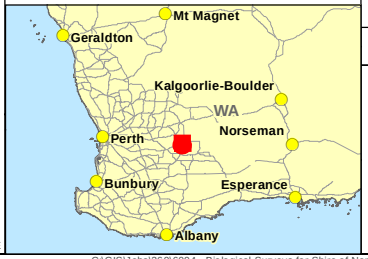
0 0.75 1.5 3 km

N

Scale: 1:100,000 @ A4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



SLR
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w www.slrconsulting.com/en

PROJECT ID	DATE
6400	24/10/2023

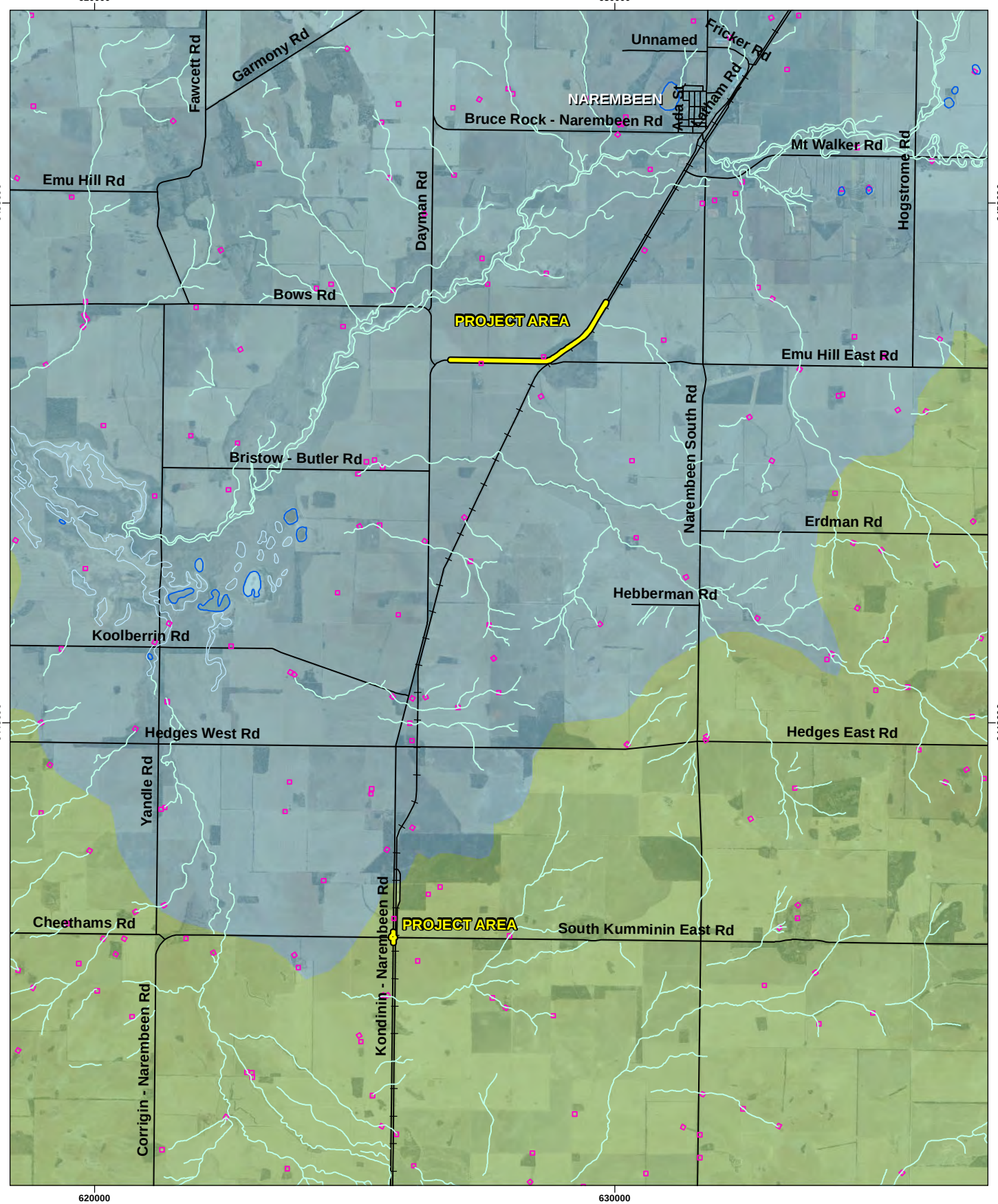
HORIZONTAL DATUM AND PROJECTION
GDA2020 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
ENVIRONMAPS	SG	SG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 1
Project Area Location

C:\GIS\Jobs\360\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F01 Project Area Location_231024.mxd



Legend

- Project Area
- Road
- Railway
- Watercourse - minor, non-perennial
- Lake - non-perennial
- Area Subject to Inundation
- Earth Dam

IBRA7 Regions

- Avon Wheatbelt
- Mallee

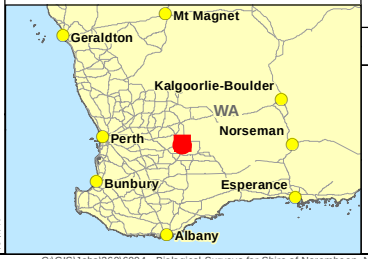
- HYDROGRAPHY SOURCED DWER
- AERIAL PHOTOGRAPHY SOURCED LANDGATE
- IBRA7 REGIONS SOURCED COMMONWEALTH OF AUSTRALIA 2012

0 0.75 1.5 3 km

Scale: 1:100,000 @ A4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



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PROJECT ID	DATE
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HORIZONTAL DATUM AND PROJECTION
GDA2020 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
ENVIRONMAPS	SG	SG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 2
IBRA Regions and Hydrography

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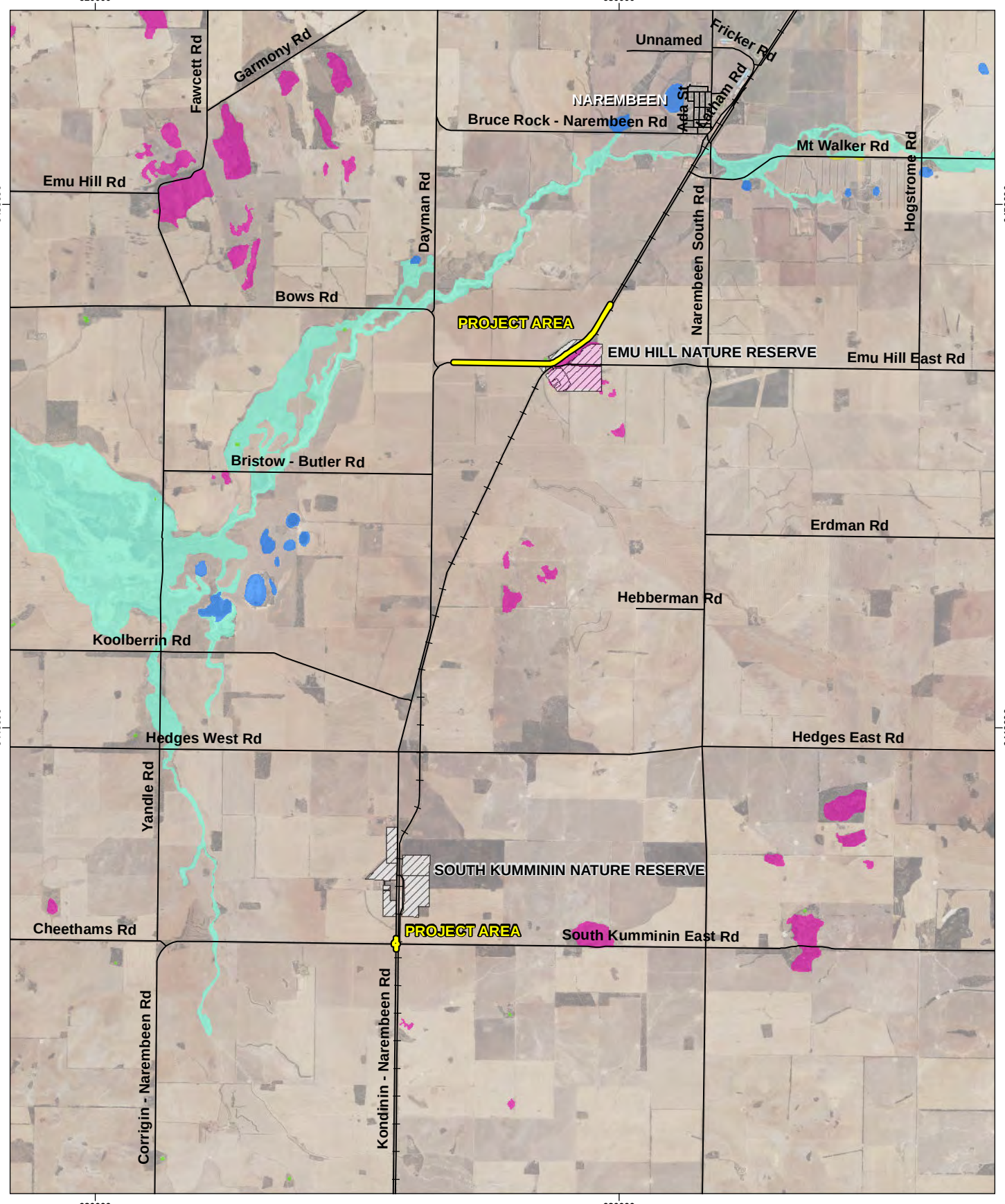


Legend

- Project Area
- Road
- Railway
- Legislated Lands and Waters
  - Nature Reserve
- Wetlands
  - Basin
  - Channel
  - Flat
  - Granite outcrop
  - Reservoir

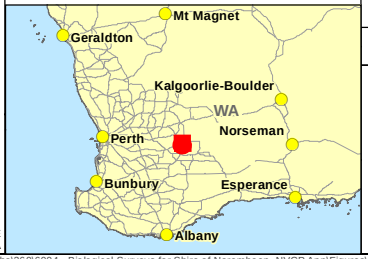
- AERIAL PHOTOGRAPHY SOURCED LANDGATE
- LEGISLATED LANDS & WATERS/WETLANDS SOURCED DBCA

0 0.75 1.5 3 km

Scale: 1:100,000 @ A4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



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PROJECT ID	DATE
6400	24/10/2023

HORIZONTAL DATUM AND PROJECTION
GDA2020 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
ENVIRONMAPS	SG	SG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 3
Conservation and Environmentally Sensitive Areas

C:\GIS\Jobs\360\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F03 Conservation and Environmentally Sensitive Areas_231024.mxd

Legend

- Project Area
- Railway
- Survey Track
- Releve
- Habitat Assessment

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- AERIAL PHOTOGRAPHY SOURCED LANDGATE

SLR
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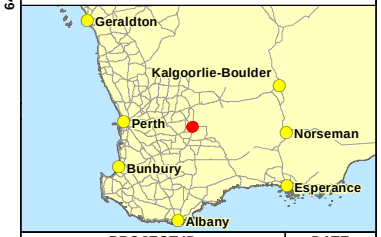
0 125 250 500 Metres

N

Scale: 1:15,000 @ A4

LOCALITY MAP



PROJECT ID	DATE
6004	15/11/2023

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GDA2020 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
Environmaps	SG	SG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 4a
Survey Effort

C:\GIS\Jobs\360\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F04a Survey Effort_231115.mxd

Legend

- Project Area
- Road
- Railway
- Survey Tracks
- Releve
- Habitat Assessment

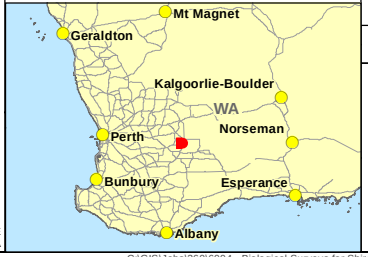
0 10 20 40 m

Scale: 1:1,250 @ A4

N

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



- AERIAL PHOTOGRAPHY SOURCED LANDGATE
- LEGISLATED LANDS & WATERS/WETLANDS SOURCED DBCA

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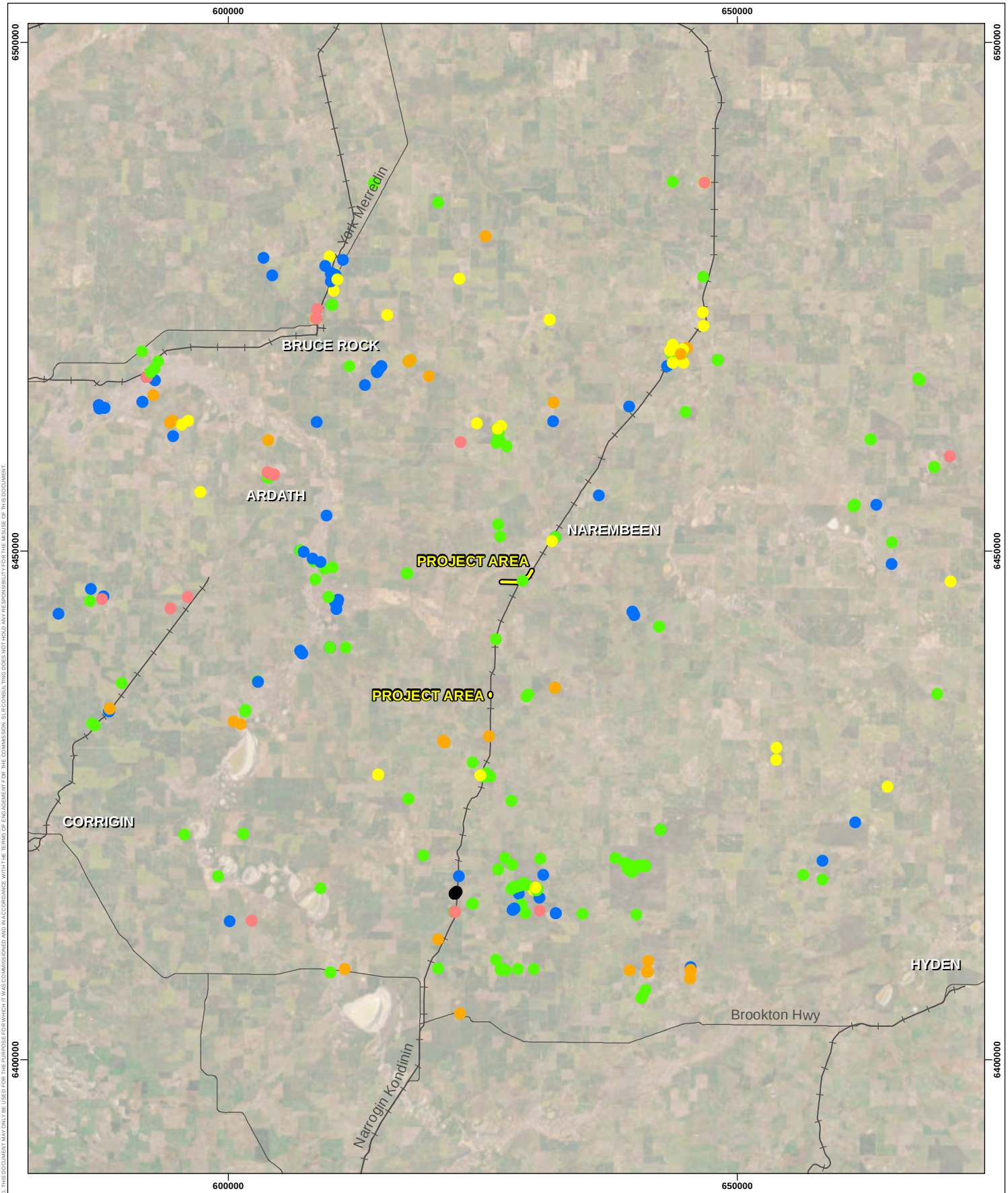
ENVIRONMAPS	SG	LG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 4b
Survey Effort

C:\GIS\Jobs\360\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F04b Survey Effort_231115.mxd



Legend

- Project Area
- Railway

DBCA Threatened and Priority Flora Locations

- Extinct
- Threatened
- Priority 1
- Priority 2
- Priority 3
- Priority 4

- AERIAL PHOTOGRAPHY SOURCED LANDGATE

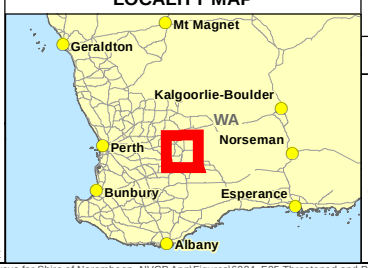
0 3.75 7.5 15 km

N

Scale: 1:500,000 @ A4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



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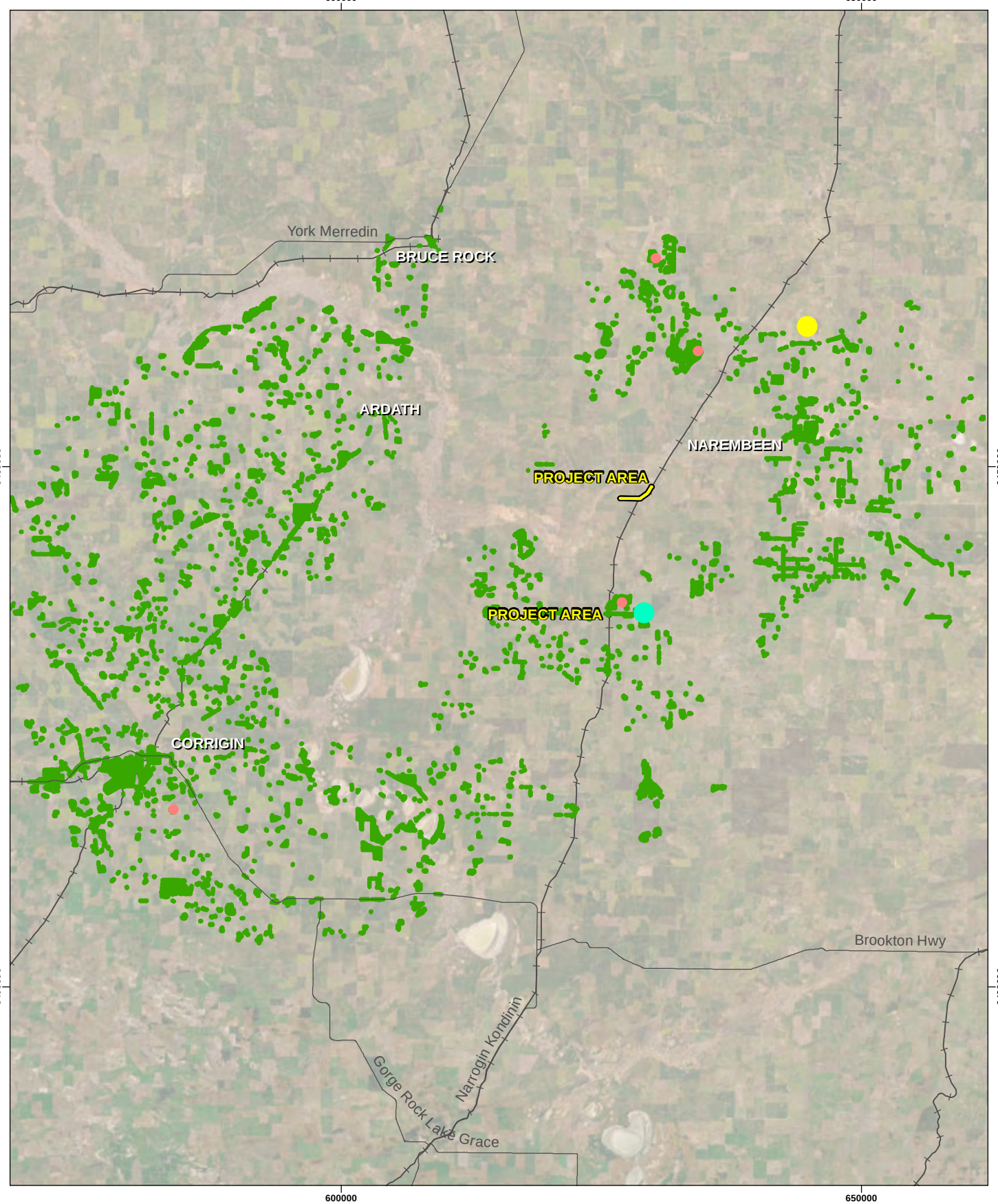
ENVIRONMAPS	SG	SG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 5

Threatened and Priority Flora Locations Identified by DBCA Database Searches

C:\GIS\Jobs\360\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F05 Threatened and Priority Flora Locations Identified by DBCA Database Searches_231115.mxd



Legend

- Project Area
- Railway

DBCA Threatened and Priority Ecological Communities

- Gimlet Woodlands
- Salmon Gum Woodlands
- Wheatbelt Woodlands
- York Gum Woodlands

- AERIAL PHOTOGRAPHY SOURCED LANDGATE

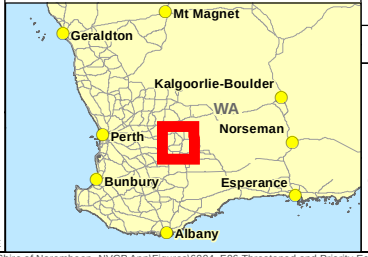
0 3.75 7.5 15 km

N

Scale: 1:500,000 @ A4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



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ENVIRONMAPS	SG	SG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 6

Threatened and Priority Ecological Communities Identified by DBCA Database Searches

C:\GIS\Jobs\360\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F06 Threatened and Priority Ecological Communities Identified by DBCA Database Searches_231115.mxd

Legend

- Project Area
- Railway

Vegetation Types

- ElCh
- EmEuEw
- EsEsCh
- EyCh
- MyHe
- PC
- RE
- RD

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- AERIAL PHOTOGRAPHY SOURCED LANDGATE

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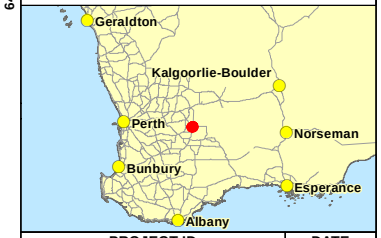
0 125 250 500 Metres

N

Scale: 1:15,000 @ A4

LOCALITY MAP



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HORIZONTAL DATUM AND PROJECTION
GDA2020 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
Environmaps	SG	SG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 7

Vegetation Types and Significant Flora Recorded in the Northern Area

C:\GIS\Jobs\600\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F07 Vegetation Types and Significant Flora Recorded in the Northern Area_231024.mxd

Legend

- Project Area
- Railway

Vegetation Condition

- Very Good - Good
- Good
- Degraded
- Completely Degraded
- Road

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- AERIAL PHOTOGRAPHY SOURCED LANDGATE

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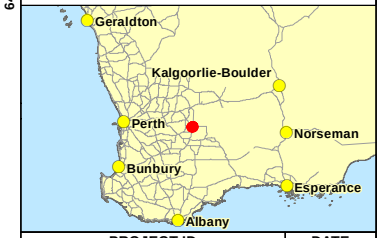
0 125 250 500 N

Metres

Scale: 1:15,000 @ A4

LOCALITY MAP



PROJECT ID	DATE
6004	24/10/2023

HORIZONTAL DATUM AND PROJECTION
GDA2020 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
Environmaps	SG	SG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 8
Vegetation Condition Mapping of the Northern Area

G:\GIS\Jobs\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F08 Vegetation Condition Mapping of the Northern Area_231024.mxd

Legend

- Project Area
- Railway
- Threatened Ecological Communities Patch

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- AERIAL PHOTOGRAPHY SOURCED LANDGATE

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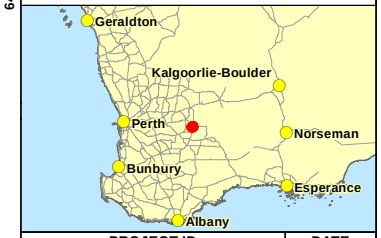
0 125 250 500 N

Metres

Scale: 1:15,000 @ A4

LOCALITY MAP



PROJECT ID	DATE
6004	24/10/2023

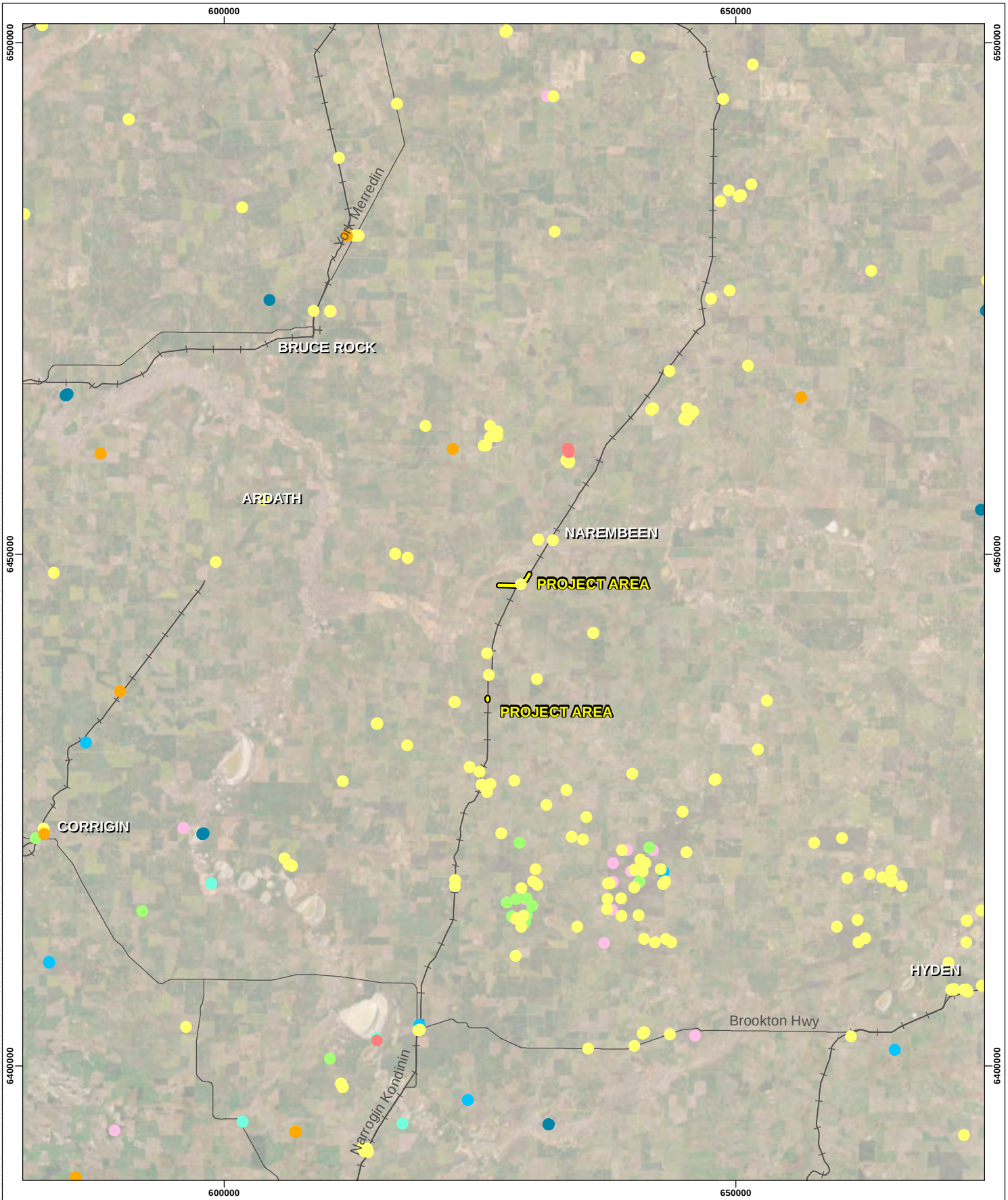
HORIZONTAL DATUM AND PROJECTION
GDA2020 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
Environmaps	SG	SG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 9

Threatened Ecological Communities Patch Mapping of the Northern Area



Legend

- Project Area
- Railway

DBCA Threatened and Priority Fauna Locations

- Extinct
- Threatened - Critically Endangered
- Threatened - Endangered
- Threatened - Vulnerable
- Specially Protected - Conservation Dependent
- Specially Protected - Migratory
- Specially Protected - Other Specially Protected
- Priority 1
- Priority 3
- Priority 4

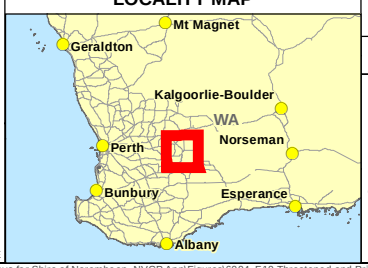
- AERIAL PHOTOGRAPHY SOURCED LANDGATE

0 3.75 7.5 15 km

Scale: 1:500,000 @ A4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



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ENVIRONMAPS	SG	SG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 10

Threatened and Priority Fauna Locations Identified by DBCA Database Searches

C:\GIS\Jobs\360\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F10 Threatened and Priority Fauna Locations Identified by DBCA Database Searches_231115.mxd

Legend

- Project Area
- Railway

Fauna Habitat

- Trees over native understorey
- Trees over paddock
- Heathland/scrubland
- Cleared

Terrestrial Vertebrate

- Barnardius zonarius
- Canis lupis
- Coracina novaehollandiae
- Corvus bennetti
- Corvus coronoides
- Eolophus roseicapilla
- Gymnorhina tibicen
- Rhipidura albiscapa

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- AERIAL PHOTOGRAPHY SOURCED LANDGATE

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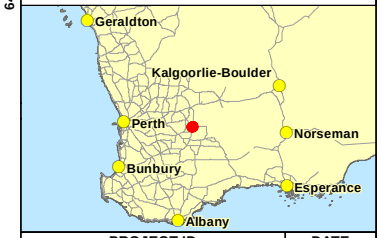
0 125 250 500 Metres

N

Scale: 1:15,000 @ A4

LOCALITY MAP



PROJECT ID	DATE
6004	24/10/2023

HORIZONTAL DATUM AND PROJECTION
GDA2020 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
Environmaps	SG	SG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 11

Fauna Habitats and Fauna Records Within the Northern Survey Area

G:\GIS\Jobs\360\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F11 Fauna Habitats and Fauna Records Within the Northern Survey Area_231024.mxd

Legend

- Project Area
- Railway

Black Cockatoo Assessment

- Low Quality Black Cockatoo Foraging Habitat
- Black Morrel *(Eucalyptus melanoxylon)*
- Merrit *(Eucalyptus urna)*
- Salmon Gum *(Eucalyptus Salmonophloia)*
- Wheatbelt Wandoo *(Eucalyptus capillosa)*
- Yorrel *(Eucalyptus yilgarnensis)*

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- AERIAL PHOTOGRAPHY SOURCED LANDGATE

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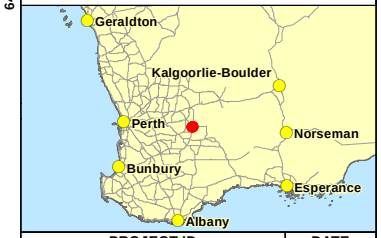
0 125 250 500 Metres

N

Scale: 1:15,000 @ A4

LOCALITY MAP



PROJECT ID	DATE
6004	24/10/2023

HORIZONTAL DATUM AND PROJECTION
GDA2020 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
Environmaps	SG	SG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 12
Black Cockatoo Assessment for the Northern Survey Area

G:\GIS\Jobs\660\6004 Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F12 Black Cockatoo Assessment for the Northern Survey Area_231024.mxd

Legend

- Project Area
- Road
- Railway

Vegetation Types

- CL
- EsEsCh
- EyCh
- PC
- RE
- RD

- AERIAL PHOTOGRAPHY SOURCED LANDGATE
- LEGISLATED LANDS & WATERS/WETLANDS SOURCED DBCA

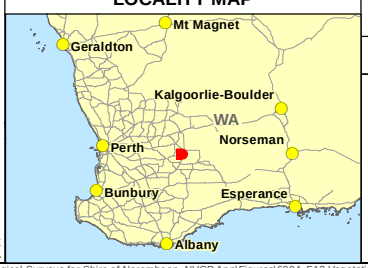
0 10 20 40 m

N

Scale: 1:1,250 @ A4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



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ENVIRONMAPS	SG	LG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 13

Vegetation Types and Significant Flora Recorded in the Northern Area

C:\GIS\Jobs\360\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F13 Vegetation Types and Significant Flora Recorded in the Northern Area_231024.mxd

Legend

- Project Area
- Road
- Railway

Vegetation Condition

- Good
- Degraded
- Completely Degraded
- Cleared
- Road

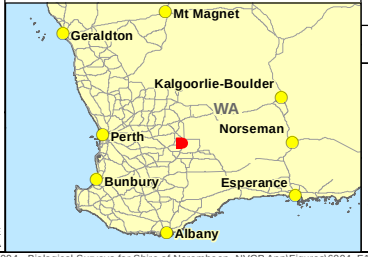
0 10 20 40 m

N

Scale: 1:1,250 @ A4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



- AERIAL PHOTOGRAPHY SOURCED LANDGATE
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ENVIRONMAPS	SG	LG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 14
Vegetation Condition Mapping of the Southern Survey Area

C:\GIS\Jobs\360\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F14 Vegetation Condition Mapping of the Southern Survey Area_231024.mxd

Legend

- Project Area
- Road
- Railway
- Threatened Ecological Communities Patch

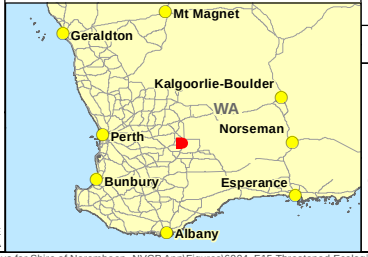
0 10 20 40 m

N

Scale: 1:1,250 @ A4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



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- LEGISLATED LANDS & WATERS/WETLANDS SOURCED DBCA

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ENVIRONMAPS	SG	LG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 15

Threatened Ecological Communities Patch Mapping of the Northern Area

C:\GIS\Jobs\360\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F15 Threatened Ecological Communities Patch Mapping of the Southern Survey Area_231024.mxd

Legend

- Project Area
- Road
- Railway

Fauna Habitat

- Trees over paddock
- Cleared

Terrestrial Vertebrate

- *Acanthiza chrysorrhoa*
- *Barnardius zonarius*
- *Falco cenchroides*
- *Gehyra variegata*
- *Smincornis brevirostris*

- AERIAL PHOTOGRAPHY SOURCED LANDGATE

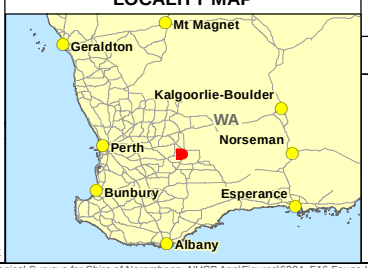
0 10 20 40 m

N

Scale: 1:1,250 @ A4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



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ENVIRONMAPS	SG	LG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 16

Fauna Habitats and Fauna Records Within the Southern Survey Area

C:\GIS\Jobs\360\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F16 Fauna Habitats and Fauna Records Within the Southern Survey Area_231024.mxd

Legend

- Project Area
- Road
- Low Quality Black Cockatoo Foraging Habitat
- Railway
- Merrit *(Eucalyptus urna)*
- Wheatbelt Wandoo *(Eucalyptus capillosa)*
- Salmon Gum *(Eucalyptus Salmonophloia)*
- 3 Indicates the amount of hollows

- AERIAL PHOTOGRAPHY SOURCED LANDGATE

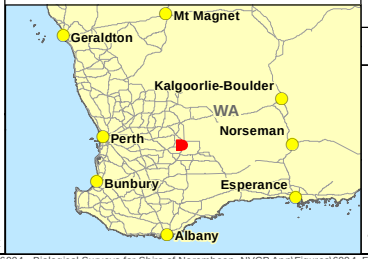
0 10 20 40 m

Scale: 1:1,250 @ A4

N

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



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CREATED	CHECKED	APPROVED	REVISION
ENVIRONMAPS	SG	LG	0

SHIRE OF NAREMBEEN
Biological Surveys for Shire of Narembeen NVCP Application

Figure 17
Black Cockatoo Assessment for the Southern Survey Area

C:\GIS\Jobs\360\6004 - Biological Surveys for Shire of Narembeen, NVCP App\Figures\6004_F17 Black Cockatoo Assessment for the Southern Survey Area_241030.mxd

Appendix B Flora Literature Review

Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

SLR Project No.: 675.VX5781.00001

October 31, 2024

Report	Project Area	Survey Timing	Survey Effort	Significant Ecological Communities	Significant Flora	Introduced Flora
Reconnaissance and Targeted Flora and Vegetation Survey Hyden-Norseman Road 55.8SLK, Forrestania by Ecoedge	Hyden-Norseman Road. from Forbes Road, Forrestania	11th Sep 2018	Reconnaissance and Targeted flora and vegetation survey	• None	• None	• None
Hyden Flora, Vegetation and Fauna Surveys, by Ecoscape	Western edge of the of Hyden within the Shire of Kondinin	Sep and Nov 2019	Detailed flora and vegetation survey	• None	• None	• 26 introduced flora • One Declared Pest, Morea flaccida • No WoNS
King Rocks Wind Farm Flora, Vegetation and Fauna Assessment by 360 Environmental	Approximately 40 km northeast of Hyden	3rd – 7th Nov 2021	Reconnaissance and targeted flora and vegetation survey	• None	• None	• 11 introduced flora • No Declared Pests or WoNS
Vegetation Survey Baandee North Road, Shire of Kellerberrin, by Santaleuca Consulting	Hearle Road to nearly 3km north of Beresford Road, SLK 10.54 to SLK 23).	Oct 2018	Targeted Flora Survey	• None	• *Aluta aspera* subsp. *localis* (P2)	• None

Appendix C Flora Likelihood of Occurrence, Northern Area

Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

SLR Project No.: 675.VX5781.00001

October 31, 2024

Appendix/Table x: Assessment of the Likelihood of Occurrence of Threatened and Priority Flora as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2022 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 20 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing. 1: Department of the Environment (2021). SPRAT EPBC Threatened Flora in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. 2: Department of Biodiversity, Conservation and Attractions (2021). FloraBase - TheWestern Australian Flora. https://florabase.dpaw.wa.gov.au/

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Pre-Survey Likelihood of Occurrence	Habitat occurs within the Survey Area	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Threatened											
Boronia capitata subsp. capitata	T	EN	X		X	29.3 km	Aug - Feb	This species grows below a lateritic breakaway in a white sandplain.[1]	Low	No	Low
Conospermum galeatum	T	CR	X		X	13.0 km	Aug - Sep	Yellow sand.	Medium	No	Low
Rhizanthella gardneri	T	CR	X		X	32.7 km	May - Jul	Sand. Grows in association with Melaleuca uncinata.[2]	Low	No	Low
Symonanthus bancroftii	T	EN	X	X	X	25.5 km	Jul - Sep	Moist, grey clay over granite. Mid-lower slope, edges of ephemeral wetland. Disturbed areas.[2]	Low	No	Low
Priority 1											
Acacia sclerophylla var. teretiuscula	P1				X	29.9 km	Sep - Oct	Clay and loamy soils.[2]	Low	No	Low
Acacia tetraneura	P1				X	15.4 km	May - Jul	Clay & lateritic gravel. Ridges & low rises.[2]	Medium	No	Low
Acacia torticarpa	P1				X	10.1 km	Aug	Grey/brown sand/gravel. Plains.[2]	Medium	No	Low
Dampiera scaevolina	P1				X	13.7 km	Sep - Nov	Sandy & gravelly soils.[2]	Medium	No	Low
Gastrolobium tenue	P1				X	13.1 km	Sep - Oct	Yellow sand or sandy clay. Undulating dunes, stony outcrops.[2]	Medium	No	Low
Hibbertia sp. Bendering (J.W. Horn 4101)	P1				X	32.4 km	Sep	Laterite over duricrust.[2]	Low	No	Low
Melaleuca grieveana	P1				X	24.6 km	Jul	Well-drained orange-brown loam, brown clay. Plains, gentle slopes, edge of crop paddocks.[2]	Low	No	Low
Melaleuca manglesii	P1				X	30.0 km	Sep	White sand.[2]	Low	No	Low
Melichrus sp. Bruce Rock (J. Buegge D 36)	P1				X	30.0 km	Unkown	Gentle slope, dry, bare brown-red gravel.[2]	Low	No	Low
Scaevola tortuosa	P1				X	39.9km	Oct	Sandy clay. Margins of salt lakes.[2]	Low	No	Low

[1] Department of Agriculture, Water and Environment (2023) [2]Western Australian Herbarium (2023)

Priority 2											
Acacia arcuatilis	P2				X	17.3 km	Jun - Aug	Sand or sandy loam, sometimes with lateritic gravel. Undulating plains, rises.[2]	Medium	No	Low
Acacia lirellata subsp. compressa	P2				X	23.5 km	Jun - Aug	Yellow sand, clayey loam. Sandplains.[2]	Low	No	Low
Austrobaeckea narembeen	P2		X		X	13.1 km	Nov - Mar	Light brown silty to clayey fine to coarse sand over granite (outcropping in places).[2]	Low	No	Low
Banksia splendida subsp. splendida	P2				X	3.3 km	Jul - Sep	Sandy and loamy soils with lateritic gravel.[2]	High	No	Low
Calytrix sagei	P2				X	3.3 km	Dec	Low plain - gently undulating plain. Grey brown sandy clay soil with underlying granite.[2]	High	No	Low
Conostylis albescens	P2				X	24.5 km	Aug	Yellow sand. Sandplains.[2]	Low	No	Low
Eutaxia hirsuta	P2				X	24.1 km	Oct	Dry, white/brown sandy clay plains.[2]	Low	No	Low
Hibbertia chartacea	P2				X	22.3 km	Sep	Sand, laterite. Sandplain with breakaways.[2]	Low	No	Low
Microcorys sp. Tarin Rock (E.J. Croxford 525	P2				X	30.5 km	Oct	Sandy gravel, sandplains.[2]	Low	No	Low
Ricinocarpos tuberculatus	P2				X	14.2 km	Sep - Oct	White/grey sand. Coastal dunes.[2]	Medium	No	Low
Thysanotus sp. Yellowdine (A.S. George 604	P2				X	28.0 km	Mar or Dec	Yellow sand, sandy clay. Sandplains, undulating ridges.[2]	Low	No	Low
Verticordia multiflora subsp. solox	P2				X	24.1 km	Oct - Jan	Yellow sand over gravel, sand over granite.[2]	Low	No	Low
Verticordia pulchella	P2				X	30.3 km	Oct - Nov	Sandy soils over granite. Massive granite areas.[2]	Low	No	Low
Priority 3											
Acacia ancistrophylla var. perarcuata	P3		X			24.8 km	Aug - Sep	Red sand, clay loam, loam. Undulating plains.[2]	Low	No	Low
Acacia deflexa	P3				X	17.2 km	Aug - Sep	Yellow, gravelly lateritic sand, gravelly sandy loam, plains.[2]	Medium	No	Low
Acacia dissona var. indoloria	P3				X	30.2 km	Aug - Sep	Sand, sandy loam. Undulating plains.[2]	Low	No	Low
Acacia eremophila var. variabilis	P3				X	26.0 km	Sep	Sand, sandy loam.[2]	Low	No	Low
Acacia inophloia	P3				X	4.0 km	Aug - Oct	Yellow sand, gravelly granitic soils.[2]	Low	No	Low

[1] Department of Agriculture, Water and Environment (2023) [2]Western Australian Herbarium (2023)

Anticoryne melanosperma	P3				X	29.7 km	Sep - Dec	Brown sand/loam, gravel. Undulating plains.[2]	Low	No	Low
Austrostipa nunaginensis	P3				X	30.2 km	Unkown	Yellow brown sands.[2]	Low	No	Low
Balaustion exsertum	P3		X			14.2 km	Sep	Brown sand/loam/clay.[2]	Medium	No	Low
Banksia horrida	P3				X	3.8 km	Apr - Jun or Aug	Sand, sometimes with gravel.[2]	High	No	Low
Banksia rufa subsp. chelomacarpa	P3				X	40 km	Jul -Oct	Sandy loam over gravel.[2]	Low	No	Low
Banksia rufa subsp. obliquiloba	P3				X	27 km	Sep - Oct	Gravelly loam.[2]	Medium	No	Low
Banksia xylothemelia	P3				X	28.3 km	Sep - Oct	Sandy loam, usually over laterite. Sandplains.[2]	Low	No	Low
Calytrix nematoclada	P3				X	26.9 km	Sep - Jan	Yellow or grey sand. Sandplains.[2]	Medium	No	Low
Cryptandra dielsii	P3				X	24.6 km	Jul - Sep	Sand, often over laterite. Sandplains.[2]	Low	No	Low
Daviesia nudiflora subsp. drummondii	P3				X	6.0 m	Jul - Aug	White or grey sand. Undulating low rises.[2]	High	No	Medium
Dicrastylis reticulata	P3				X	3.3 km	Sep - Dec	Sandy soils, often over granite. Amongst granite rock, hills, flats.[2]	High	No	Low
Dielsiodoxa leucantha subsp. leucantha	P3				X	26.4 km	May - Sep	Dry, rocky, brown loam over quartzite.[2]	Low	No	Low
Eucalyptus erythronema subsp. inornata	P3				X	19.4 km	Aug - Dec	Flat, white sand. Gravelly, grey-brown sandy loam.[2]	Medium	No	Low
Eucalyptus exigua	P3				X	17.3 km	Mar - Apr or Oct or	Sandy loam, white sand. Sandplains.[2]	Medium	No	Low
Eucalyptus ornata	P3				X	27.9 km	Jan	Laterite. Ridges.[2]	Low	No	Low
Eucalyptus spathulata subsp. salina	P3				X	18 km	Unkown	Grey-white sand, pale brown sandy clay over granite, saline soils. Flats, broad valley floors, saline depressions, edges salt lakes, rises.[2]	Medium	No	Low
Eucalyptus subangusta subsp. virescens	P3				X	11.3 km	Apr	Yellow sand, white clay.[2]	Medium	No	Low
Eutaxia actinophylla	P3				X	18.5 km	Sep to Oct.	Red-brown clay loam, red clay loam over granite, gravel. Small depressions.	Medium	No	Low
Frankenia drummondii	P3				X	19.6 km	Oct - Nov	Sand, lake edges.[2]	Medium	No	Low

[1] Department of Agriculture, Water and Environment (2023) [2]Western Australian Herbarium (2023)

Appendix D Flora Inventory

Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

SLR Project No.: 675.VX5781.00001

October 31, 2024

Taxon	Northern Survey Area (SLK 19.5-23)	Southern Survey Area (Cheetams)
Amaranthaceae		
Ptilotus polystachyus	✓	✓
Asteraceae		
*Erigeron bonariensis	✓	✓
*Sonchus oleraceus	✓	
Siemssenia capillaris	✓	
Vittadinia gracilis		✓
Brassicaceae		
*Raphanus raphanistrum	✓	✓
Chenopodiaceae		
Atriplex semibaccata	✓	✓
Maireana suadifolia	✓	✓
Marieana brevifolia	✓	✓
Rhagodia drummondii	✓	✓
Salsola australis		✓
Sclerolaeana diacantha		✓
Cyperaceae		
Lepidosperma ?apricola	✓	
Lepidosperma gladiatum	✓	
Fabaceae		
Acacia acuminata	✓	
Acacia hemiteles	✓	
Acacia merrallii	✓	✓
Daviesia aphylla	✓	✓
Senna artemisiodes subsp. Filifolia	✓	
Hemerocallidaceae		
Dianella revoluta	✓	
Iradaceae		
*Romulea rosea	✓	
Salsola australis	✓	
Sclerolaeana diacantha	✓	
Iridaceae		
*Romulea rosea		✓
Myrtaceae		
Calothamnus quadrifidus	✓	
Eucalyptus ?astringens	✓	
Eucalyptus ?cylindriflora	✓	
Eucalyptus ?eremophila		✓
Eucalyptus ?platypus	✓	
Eucalyptus loxophleba subsp. lissophloia	✓	
Eucalyptus melanoxylon	✓	
Eucalyptus salmonophloia	✓	✓
Eucalyptus salubris	✓	✓
Eucalyptus sp.	✓	
Eucalyptus torquata	✓	
Eucalyptus urna	✓	
Eucalyptus wandoo subsp. wandoo	✓	✓
Eucalyptus yilgarnensis		✓
Leptospermopsis erubescens	✓	

Melaleuca ?lanceolata	✓	
Melaleuca hamata	✓	
Melaleuca hamulosa	✓	
Melaleuca lateriflora	✓	
Poaceae		
*Bromus rubens	✓	✓
*Ehrharta calycina	✓	
*Poa annua	✓	✓
Austrostipa elegantissima	✓	✓
Eriachne ? ovata	✓	✓
Proteaceae		
Grevillea hakeoides	✓	
Hakea lissocarpha	✓	
Restionaceae		
Desmocladus asper	✓	
Rubiaceae		
Opercularia vaginata	✓	
Santalaceae		
Santalum acuminatum	✓	✓
Grand Total		**23**

Appendix E Flora Site Sheets, Northern Area

Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

SLR Project No.: 675.VX5781.00001

October 31, 2024

FLORA SITE SHEET

Project Name Narembeen Biological
Site: NARR02
Location MGA 50 626968 **mE** 6446986 **mN**

Described by: RM
Date: 5-07-2023
Type: Releve

Landform: Plain
Slope: Flat
Rock Type: Gravel
Soil Type: Loam,Sand
Soil Colour: Orange

Vegetation: *Eucalyptus ?astringens, E. ?cylindriflora and E. torquata woodland over Acacia acuminata tall sparse shrubland over Melaleuca ?lanceolata mid sparse shrubland over A. hemiteles, Marieana brevifolia and Sclerolaeana diacantha low sparse shrubland over *Poa annua sparse low grassland.*

Condition: Good **Disturbance Type:**
Fire Age: Long unburnt

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	250	10	
Acacia hemiteles	90	5	NARR02-3
Austrostipa elegantissima	70	0.1	
Eriachne ? ovata	70	0.1	
Eucalyptus ?astringens	650	10	NARR02-1
Eucalyptus ?cylindriflora	400	10	NARR02-2
Eucalyptus ?platypus	210	5	NARR02-5
Eucalyptus salubris	400	5	
Eucalyptus torquata	400	5	NARR02-6
Marieana brevifolia	70	0.5	NARR01-7=
Melaleuca ?lanceolata	150	10	NARR02-4
**Poa annua*	20	5	
**Raphanus raphanistrum*	70	0.1	
Rhagodia drummondii	70	0.1	
Salsola australis	50	0.5	
Sclerolaeana diacantha	30	0.5	
Sonchus oleraceus	5	0.1	

FLORA SITE SHEET

Project Name Narembeen Biological
Site: NARR03
Location MGA 50 629256 **mE** 6447319 **mN**

Described by: RM
Date: 5-07-2023
Type: Releve

Landform: Plain
Slope: Flat
Rock Type: Gravel
Soil Type: Loam,Sand
Soil Colour: Grey,Orange

Vegetation: *Eucalyptus loxophleba subsp. lissophloia low woodland over Santalum acuminatum mid sparse shrubland over Marieana brevifolia, M. suadifolia and Daviesia aphylla low sparse shrubland over Austrostipa elegantissima, Eriachne ?ovata low sparse grassland over Dianella revoluta low sparse forbs.*

Condition: Very Good **Disturbance Type:**
Fire Age: Long unburnt

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex semibaccata	5	0.1	NARR01-6=
Austrostipa elegantissima	40	0.5	NARR01-5=
Daviesia aphylla	60	1	NARR01-10=
Desmocladus asper	20	0.1	NARR03-4
Dianella revoluta	50	1	
**Ehrharta calycina*	70	10	
Eriachne ?ovata	30	0.5	NARR01-3=
Eucalyptus loxophleba subsp. lissophloia	700	45	NARR03-2
Lepidosperma gladiatum	50	0.1	NARR03-1
Maireana suadifolia	70	0.5	NARR01-8
Marieana brevifolia	70	1.5	NARR01-7=
Salsola australis	30	0.1	
Santalum acuminatum	140	5	
Sclerolaeana diacantha	15	1	NARR01-2=
Siemssenia capillaris	5	0.1	NARR03-3

FLORA SITE SHEET

Project Name Narembeen Biological
Site: NARR05
Location MGA 50 627750 **mE** 6446970 **mN**

Described by: RM
Date: 4-07-2023
Type: Releve

Landform: Plain
Slope: Flat
Rock Type: Gravel
Soil Type:
Soil Colour: Orange

Vegetation: *Eucalyptus ?cylindriflora, E. torquata and E. ?platypus low open woodland over Acacia acuminata tall sparse shrubland over Melaleuca lateriflora, Senna artemisiodes subsp. filifolia and Calothamnus quadrifidus mid sparse shrubland over Acacia hemiteles, Marieana brevifolia and Sclerolaeana diacantha low sparse shrubland over *Poa*

Condition: Good **Disturbance Type:**
Fire Age: Long unburnt

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	250	10	
Acacia hemiteles	90	5	NARR02-3=
Austrostipa elegantissima	70	0.1	
Calothamnus quadrifidus	130	6	RMOPP-13=
Eriachne ? ovata	70	0.1	
Eucalyptus ?cylindriflora	400	10	NARR02-2=
Eucalyptus ?platypus	210	5	NARR02-5=
Eucalyptus torquata	400	5	NARR02-6=
Marieana brevifolia	70	0.5	NARR01-7=
Melaleuca ?lanceolata	150	10	NARR02-4=
Melaleuca hamata	140	5	RMOPP-12=
Melaleuca lateriflora	180	3	RMOPP-11=
Poa annua	20	5	
Raphanus raphanistrum	70	0.1	
Rhagodia drummondii	70	0.1	
Salsola australis	50	0.5	
Sclerolaeana diacantha	30	0.5	
Senna artemisiodes subsp. filifolia	160	5	RMOPP-14=
Sonchus oleraceus	5	0.1	

FLORA SITE SHEET

Project Name Narembeen Biological
Site: NARR06
Location MGA 50 628479 **mE** 6446946 **mN**

Described by: RM
Date: 4-07-2023
Type: Releve

Landform: Plain
Slope: Flat
Rock Type: Gravel
Soil Type: Loam,Sand
Soil Colour: Orange

Vegetation: *Eucalyptus loxophleba subsp. lissophloia low woodland over Santalum acuminatum mid sparse shrubland over Marieana brevifolia, M. suadifolia and Sclerolaeana diacantha low sparse shrubland over *Ehrharta calycina, Eriachne ?ovata and *Poa annua low sparse grassland.*

Condition: Very Good - Good **Disturbance Type:**
Fire Age: Long unburnt

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex semibaccata	5	0.1	NARR01-6=
Atriplex semibaccata	5	0.1	NARR01-6=
Austrostipa elegantissima	40	1	NARR01-5=
Daviesia aphylla	60	1	NARR01-10=
Desmocladus asper	20	0.1	NARR03-4=
**Ehrharta calycina*	70	15	
Eriachne ? ovata	30	2	NARR01-3=
Eucalyptus loxophleba subsp. lissophloia	600	45	NARR03-2=
Lepidosperma gladiatum	50	0.1	NARR03-1=
Maireana suadifolia	70	0.5	NARR01-8=
Marieana brevifolia	70	1.5	NARR01-7=
**Poa annua*	10	2	
Salsola australis	30	0.1	
Santalum acuminatum	140	5	
Sclerolaeana diacantha	15	1	NARR01-2=

Appendix F TEC Assessment

Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

SLR Project No.: 675.VX5781.00001

October 31, 2024

Key Diagnostic characteristics for the ecological community TEC Patch #	1	2	3	4	5	6	7	8	9	10
1. The distrbution of the ecological community is limited to these IBRA bioregions and subregions:										
Avon Wheatbelt - subregions AVW01 Merredin and AVW02 Katanning	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
or										
Mallee - MAL02 Western Mallee only;										
or										
Eastern parts of JAF01 Northern Jarrah Forests and JAF02 Jarrah Forests adjacent to the Avon Wheatbelt										
2.The structure of the ecological community is a woodland in which the minimum crown cover of the tree canopy in a mature woodland is 10%.										
>10%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<10%										
3. The key species of the tree canopy are species of Eucalyptus as identified in Table 2a of the Approved Conservation Advice:										
Eucalyptus accedens										
Eucalyptus aequioperta										
Eucalyptus alipes										
Eucalyptus astringens										
Eucalyptus capillosa										
Eucalyptus densa subsp. densa										
Eucalyptus extensa										
Eucalyptus falcata										
Eucalyptus gardneri										
Eucalyptus goniocarpa										
Eucalyptus kondininensis										
Eucalyptus longicornis										
Eucalyptus loxophleba subsp. loxophleba										
Eucalyptus melanoxylon			✓	✓		✓				
Eucalyptus mimica subsp. continens										
Eucalyptus mimica subsp. mimica										
Eucalyptus myriadena										
Eucalyptus occidentalis										
Eucalyptus ornata										
Eucalyptus recta										
Eucalyptus rudis subsp. rudis										

Eucalyptus salicola										
Eucalyptus salmonophloia	✓	✓								
Eucalyptus salubris		✓								
Eucalyptus sargentii subsp. sargentii										
Eucalyptus singularis										
Eucalyptus spathulata subsp. spathulata										
Eucalyptus spathulata subsp. salina Salt										
Eucalyptus urna						✓				
Eucalyptus wandoo subsp. pulverea										
Eucalyptus wandoo subsp. wandoo	✓			✓	✓	✓				
4. A native understorey is present but is of variable composition, being a combination of grasses, other herbs and shrubs, as specified in Table A1 of Appendix A of the Approved Conservation Advice.										
Species present as listed in Table A1?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Species absent as listed in Table A1?										
5. <u>Contra-indicators:</u> The presence of the following features in the vegetation indicates that the ecological community is not likely to be present.										
A dominant presence of eucalypts with a mallee growth form. However, mallee species can occur as an understorey or minor canopy component of the ecological community, as noted in the diagnostic features, above	×	×	×	×	×	×	✓	✓	✓	✓
A dominant presence of non-eucalypt species in the tree canopy, for instance Acacia acuminata (jam) or Allocasuarina huegeliana (rock sheoak). However, these non-eucalypt species can be present as an understorey or minor canopy component of the ecological community.	×	×	×	×	×	×	×	×	×	×
Shrublands or herblands in which the tree canopy layer is very sparse to absent, either naturally or maintained so through long-term disturbance. Native vegetation where a tree canopy was formerly present is often referred to as 'derived' or 'secondary' vegetation. These sites would fall below the 10 per cent minimum canopy cover threshold for a woodland, noted in the diagnostic features, above.	×	×	×	×	×	×	×	×	×	×
Woodlands that have the same key eucalypt species but occur in adjacent bioregions	×	×	×	×	×	×	×	×	×	×
Woodlands dominated by eucalypts that are restricted to granite outcrops and rocky rises, for instance Eucalyptus caesia.	×	×	×	×	×	×	×	×	×	×
6. Condition Thresholds										
Category A:										

1. Patches likely to correspond to a condition of Pristine / Excellent / Very good (Keighery, 1994).	-	-	-	-	-	-	-	-	-	-
2. Exotic plant species account for 0 to 30% of total vegetation cover in the understorey layers (i.e. below the tree canopy).	-	-	-	-	-	-	-	-	-	-
3. Mature trees (dbh >30cm) may be present or absent.	-	-	-	-	-	-	-	-	-	-
4. Minimum patch width (Roadsides only): 5 metres or more.	-	-	-	-	-	-	-	-	-	-
Category B:										
1. Patches likely to correspond to a condition of Good (Keighery, 1994).	✓	✓	✓	✓	✓	-	✓	✓	-	-
2. Exotic plant species account for more than 30, to 50% of total vegetation cover in the understorey layers (i.e. below the tree canopy)	✓	✓	✓	✓	✓	-	✓	✓	-	-
3. Mature trees are present with at least 5 trees per 0.5 ha.	✓	✓	✓	✓	✓	-	✓	✓	-	-
4. Minimum patch width (Roadsides only): 5 metres or more.	✓	✓	✓	✓	✓	-	✓	✓	-	-
Category C:										
1. Patches likely to correspond to a condition of Good (Keighery, 1994)	-	-	-	-	-	✓	-	-	✓	✓
2. Exotic plant species account for more than 30, to 50% of total vegetation cover in the understorey layers (i.e. below the tree canopy).	-	-	-	-	-	✓	-	-	✓	✓
3. Mature trees either absent or less than 5 trees per 0.5 ha present.	-	-	-	-	-	✓	-	-	✓	✓
4. Minimum patch width (Roadsides only): 5 metres or more.	-	-	-	-	-	✓	-	-	✓	✓
Category D:										
1. Patches likely to correspond to a condition of Degraded to Good (Keighery, 1994)	-	-	-	-	-	-	-	-	-	-
2. Exotic plant species account for more than 50 to 70% of total vegetation cover in the understorey layers (i.e. below the tree canopy).	-	-	-	-	-	-	-	-	-	-
3. Mature trees are present with at least 5 trees per 0.5 ha.	-	-	-	-	-	-	-	-	-	-
4. Minimum patch width (Roadsides only): 5 metres or more.	-	-	-	-	-	-	-	-	-	-
7. Outcome										
Criteria met for TEC status? (Yes/No)	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**

Appendix G Fauna Literature Review

Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

SLR Project No.: 675.VX5781.00001

October 31, 2024

Report	Project Area	Survey Timing	Survey Effort	Significant Fauna Recorded Onsite	Fauna Habitats
Fauna Habitat Assessment – Proposed Borrow Pit King Rocks Road West	King Rocks	October 2018	Fauna Habitat Assessment Targeted BC Assessment	• Nil	• Mallee shrubland/woodland • Mixed Shrubland
Proposed Car Park Upgrade – Wave Rock-Hyden	Wave Rock	October 2018	Fauna Habitat Assessment Targeted BC Assessment	• Nil	• Eucalyptus Woodland
Fauna Assessment at the Proposed Borrow Pit West Hyden-Norseman Road	Kondinin	October 2018	Fauna Habitat Assessment Targeted BC Assessment	• Nil	• Low Open Eucalyptus Woodland • Low Open Shrubland
Hyden Flora, Vegetation, and Fauna Surveys	Hyden	September 2019	Fauna Habitat Assessment Targeted BC Assessment	• Nil	• Shrubland • Chenopod Shrubland
Preliminary Report, King Rocks Wind Farm Feasibility Project	King Rocks	November 2012	Fauna Habitat Assessment Targeted BC Assessment	• Nil	• Cleared Cropland • Low Mallee Woodland
Earl Grey Lithium Project – Level 2 vertebrate fauna survey with targeted Chuditch and Malleefowl surveys	Southern Cross	Oct 2016 – Feb 2017 Sept – Nove 2017	Level 2 Fauna Assessment Targeted Chuditch and Malleefowl Assessment	• Malleefowl • Peregrine Falcon • Rainbow Bee-eater • Chuditch	• Mallee Woodland • Salmon Gum Woodland • Shrubland

Appendix H Fauna Database Search Results

Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

SLR Project No.: 675.VX5781.00001

October 31, 2024

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
BIRD	Threskiornithidae	*Plegadis falcinellus*	Glossy ibis	MI	MI
BIRD	Threskiornithidae	*Plegadis falcinellus*	Glossy ibis	MI	MI
INVERTEBRATE	Branchipodidae	*Parartemia contracta*	a brine shrimp (Wheatbelt)	P1	
INVERTEBRATE	Branchipodidae	*Parartemia contracta*	a brine shrimp (Wheatbelt)	P1	
INVERTEBRATE	Daphniidae	*Daphnia jollyi*	a water flea (inland south west)	P1	
INVERTEBRATE	Thamnocephalidae	*Branchinella simplex*	a fairy shrimp (inland WA)	P1	
INVERTEBRATE	Thamnocephalidae	*Branchinella simplex*	a fairy shrimp (inland WA)	P1	
INVERTEBRATE	Branchipodidae	*Parartemia contracta*	a brine shrimp (Wheatbelt)	P1	
INVERTEBRATE	Branchipodidae	*Parartemia contracta*	a brine shrimp (Wheatbelt)	P1	
BIRD	Scolopacidae	*Tringa nebularia*	Common greenshank	MI	MI
BIRD	Scolopacidae	*Tringa nebularia*	Common greenshank	MI	MI
BIRD	Scolopacidae	*Tringa nebularia*	Common greenshank	MI	MI
BIRD	Scolopacidae	*Tringa nebularia*	Common greenshank	MI	MI
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Scolopacidae	*Calidris ruficollis*	Red-necked stint	MI	MI
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	MI	MI
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Scolopacidae	*Calidris ruficollis*	Red-necked stint	MI	MI
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	MI	MI
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Anatidae	*Oxyura australis*	Blue-billed duck	P4	
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	MI	MI
BIRD	Cacatuidae	*Calyptorhynchus sp. 'white-tailed black cockat*	White-tailed black cockatoo	EN	EN
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Falconidae	*Falco peregrinus*	Peregrine falcon	OS	
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Scolopacidae	*Tringa nebularia*	Common greenshank	MI	MI
BIRD	Scolopacidae	*Tringa stagnatilis*	Marsh sandpiper	MI	MI
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	Woylie, brush-tailed bettong	CR	EN
MAMMAL	Peramelidae	*Isoodon fusciventer*	Quenda, southwestern brown bandicoot	P4	
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	tammar wallaby	P4	
MAMMAL	Macropodidae	*Notamacropus irma*	western brush wallaby	P4	
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus sp. 'white-tailed black cockatoo'*	white-tailed black cockatoo	EN	
MAMMAL	Macropodidae	*Notamacropus irma*	western brush wallaby	P4	
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Cacatuidae	*Calyptorhynchus sp. 'white-tailed black cockatoo'*	white-tailed black cockatoo	EN	
BIRD	Strigidae	*Ninox connivens connivens (southwest subpop.)*	barking owl (southwest subpop.)	P3	
REPTILE	Scincidae	*Egernia stokesii badia*	western spiny-tailed skink	VU	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
INVERTEBRATE	Idiopidae	*Idiosoma schoknechtorum*	Mortlock River shield-backed trapdoor spider	P3	
INVERTEBRATE	Bulimulidae	*Bothriembryon praecelsus*	a bothriembryontid land snail (Kellerberrin)	EX	
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Onychogalea lunata*	crescent nailtail wallaby, tjawalpa	EX	EX
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Perameles bougainville*	Shark Bay bandicoot, western barred bandicoot, little marl	VU	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Peramelidae	*Isoodon fusciventer*	quenda, southwestern brown bandicoot	P4	
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus sp. 'white-tailed black cockatoo'*	white-tailed black cockatoo	EN	
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	tammar wallaby	P4	
MAMMAL	Myrmecobiidae	*Myrmecobius fasciatus*	numbat, walpurti	EN	EN
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	tammar wallaby	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	woylie, brush-tailed bettong	CR	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
MAMMAL	Myrmecobiidae	*Myrmecobius fasciatus*	numbat, walpurti	EN	EN
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	woylie, brush-tailed bettong	CR	EN
BIRD	Cacatuidae	*Calyptorhynchus sp. 'white-tailed black cockatoo'*	white-tailed black cockatoo	EN	
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	tammar wallaby	P4	
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	tammar wallaby	P4	
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
MAMMAL	Dasyuridae	*Dasyurus geoffroii*	chuditch, western quoll	VU	VU
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
MAMMAL	Potoroidae	*Bettongia lesueur graii*	boodie (inland), burrowing bettong (inland)	EX	EX
MAMMAL	Potoroidae	*Bettongia lesueur graii*	boodie (inland), burrowing bettong (inland)	EX	EX
MAMMAL	Potoroidae	*Bettongia lesueur graii*	boodie (inland), burrowing bettong (inland)	EX	EX
MAMMAL	Potoroidae	*Bettongia lesueur graii*	boodie (inland), burrowing bettong (inland)	EX	EX
MAMMAL	Potoroidae	*Bettongia lesueur graii*	boodie (inland), burrowing bettong (inland)	EX	EX
MAMMAL	Potoroidae	*Bettongia lesueur graii*	boodie (inland), burrowing bettong (inland)	EX	EX
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
MAMMAL	Macropodidae	*Notamacropus irma*	western brush wallaby	P4	
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
INVERTEBRATE	Idiopidae	*Idiosoma nigrum*	shield-backed trapdoor spider	EN	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
MAMMAL	Macropodidae	*Notamacropus irma*	western brush wallaby	P4	
MAMMAL	Macropodidae	*Notamacropus irma*	western brush wallaby	P4	
MAMMAL	Macropodidae	*Notamacropus irma*	western brush wallaby	P4	
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
INVERTEBRATE	Idiopidae	*Idiosoma schoknechtorum*	Mortlock River shield-backed trapdoor spider	P3	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Muridae	*Pseudomys occidentalis*	western mouse	P4	
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
BIRD	Charadriidae	*Thinornis rubricollis*	hooded plover, hooded dotterel	P4	
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
BIRD	Falconidae	*Falco peregrinus*	peregrine falcon	OS	
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	tammar wallaby	P4	
MAMMAL	Potoroidae	*Bettongia lesueur graii*	boodie (inland), burrowing bettong (inland)	EX	EX
MAMMAL	Potoroidae	*Bettongia lesueur graii*	boodie (inland), burrowing bettong (inland)	EX	EX
MAMMAL	Potoroidae	*Bettongia lesueur graii*	boodie (inland), burrowing bettong (inland)	EX	EX
MAMMAL	Potoroidae	*Bettongia lesueur graii*	boodie (inland), burrowing bettong (inland)	EX	EX
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Muridae	*Pseudomys occidentalis*	western mouse	P4	
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Muridae	*Pseudomys occidentalis*	western mouse	P4	
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	bilby, dalgyte, ninu	VU	VU
BIRD	Psittacidae	*Platycercus icterotis xanthogenys*	western rosella (inland)	P4	
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	tammar wallaby	P4	
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Cacatua pastinator pastinator*	Muir's corella	CD	
BIRD	Cacatuidae	*Cacatua pastinator pastinator*	Muir's corella	CD	
BIRD	Cacatuidae	*Cacatua pastinator pastinator*	Muir's corella	CD	
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Psittacidae	*Pezoporus flaviventris*	western ground parrot	CR	CR
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	red-tailed phascogale, kenngoor	CD	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	woylie, brush-tailed bettong	CR	EN
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
MAMMAL	Dasyuridae	*Dasyurus geoffroii*	chuditch, western quoll	VU	VU
BIRD	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's cockatoo	EN	EN
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
BIRD	Megapodiidae	*Leipoa ocellata*	malleefowl	VU	VU

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Idiosoma nigrum*	shield-backed trapdoor spider	EN	VU
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Idiosoma nigrum*	shield-backed trapdoor spider	EN	VU
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
INVERTEBRATE	Idiopidae	*Aganippe castellum*	tree-stem trapdoor spider	P4	
BIRD	Ardeidae	*Ixobrychus dubius*	Australian little bittern	P4	
BIRD	Cacatuidae	*Calyptorhynchus baudinii*	Baudin's cockatoo	EN	EN
MAMMAL	Dasyuridae	*Dasyurus geoffroii*	Chuditch, western quoll	VU	VU
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Myrmecobiidae	*Myrmecobius fasciatus*	Numbat, walpurti	EN	EN
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	Woylie, brush-tailed bettong	CR	EN
MAMMAL	Peramelidae	*Isoodon fusciventer*	Quenda, southwestern brown bandicoot	P4	
MAMMAL	Dasyuridae	*Dasyurus geoffroii*	Chuditch, western quoll	VU	VU
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	Woylie, brush-tailed bettong	CR	EN
MAMMAL	Myrmecobiidae	*Myrmecobius fasciatus*	Numbat, walpurti	EN	EN
MAMMAL	Macropodidae	*Notamacropus irma*	Western brush wallaby	P4	
MAMMAL	Peramelidae	*Macrotis lagotis*	Bilby, dalgyte, ninu	VU	VU
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Dasyurus geoffroii*	Chuditch, western quoll	VU	VU
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Macropodidae	*Lagostrophus fasciatus fasciatus*	Banded hare-wallaby, mernine	VU	VU
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	Woylie, brush-tailed bettong	CR	EN
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	Woylie, brush-tailed bettong	CR	EN
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	Woylie, brush-tailed bettong	CR	EN
MAMMAL	Potoroidae	*Bettongia lesueur graii*	Burrowing bettong (inland), boodie (inland)	EX	EX
MAMMAL	Potoroidae	*Bettongia lesueur graii*	Burrowing bettong (inland), boodie (inland)	EX	EX
MAMMAL	Macropodidae	*Lagostrophus fasciatus fasciatus*	Banded hare-wallaby, mernine	VU	VU
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	Tammar wallaby	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Dasyuridae	*Dasyurus geoffroii*	Chuditch, western quoll	VU	VU
MAMMAL	Macropodidae	*Notamacropus irma*	Western brush wallaby	P4	
MAMMAL	Macropodidae	*Notamacropus irma*	Western brush wallaby	P4	
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Dasyurus geoffroii*	Chuditch, western quoll	VU	VU
MAMMAL	Peramelidae	*Isoodon fusciventer*	Quenda, southwestern brown bandicoot	P4	
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Dasyuridae	*Dasyurus geoffroii*	Chuditch, western quoll	VU	VU
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	Tammar wallaby	P4	
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	Tammar wallaby	P4	
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Peramelidae	*Macrotis lagotis*	Bilby, dalgyte, ninu	VU	VU

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	Woylie, brush-tailed bettong	CR	EN
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	Woylie, brush-tailed bettong	CR	EN
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	Woylie, brush-tailed bettong	CR	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Notamacropus irma*	Western brush wallaby	P4	
MAMMAL	Peramelidae	*Isoodon fusciventer*	Quenda, southwestern brown bandicoot	P4	
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	Tammar wallaby	P4	
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	Tammar wallaby	P4	
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	Tammar wallaby	P4	
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	Woylie, brush-tailed bettong	CR	EN
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	Tammar wallaby	P4	
MAMMAL	Peramelidae	*Macrotis lagotis*	Bilby, dalgyte, ninu	VU	VU
MAMMAL	Potoroidae	*Bettongia penicillata ogilbyi*	Woylie, brush-tailed bettong	CR	EN
MAMMAL	Pseudocheiridae	*Pseudocheirus occidentalis*	Western ringtail possum, ngwayir	CR	CR
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	Tammar wallaby	P4	
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	Tammar wallaby	P4	
MAMMAL	Macropodidae	*Petrogale lateralis lateralis*	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN

CLASS	FAMILY	SCI_NAME	COM_NAME	WA_status	EPBCstatus
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	Tammar wallaby	P4	
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	Tammar wallaby	P4	
MAMMAL	Myrmecobiidae	*Myrmecobius fasciatus*	Numbat, walpurti	EN	EN
MAMMAL	Macropodidae	*Notamacropus eugenii derbianus*	Tammar wallaby	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Muridae	*Pseudomys occidentalis*	Western mouse	P4	
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale calura*	Red-tailed phascogale, kenngoor	CD	VU
MAMMAL	Dasyuridae	*Phascogale tapoatafa wambenger*	South-western brush-tailed phascogale, wambenger	CD	
REPTILE	Scincidae	*Egernia stokesii badia*	Western spiny-tailed skink	VU	EN
MAMMAL	Macropodidae	*Lagostrophus fasciatus fasciatus*	Banded hare-wallaby, mernine	VU	VU
BIRD	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU

Appendix:DBCA Black Cockatoo Roosting Data

SITE_CODE	WT_2010_C	WT_2011_C	WT_2012_C	WT_2013_C	WT_2014_C	WT_2015_C	WT_2016_C	WT_2017_C	WT_2018_C	WT_2019_C	WT_TOT_C	WT_MAX_C	FRT_2014_C	FRT_2015_C	FRT_2016_C	FRT_2017_C	FRT_2018_C	FRT_2019_C	FRT_TOT_C	FRT_MAX_C	N_SURVEYS
MERMERR001	.	.	.	.	.	0	.	.	.	.	0	0	.	0	.	.	.	.	0	0	1

Appendix:DBCA White Tailed Black Cockatoo Breeding Data

WT_ID	HOL_TYPE	TREE_CAT	YRFIRSTBR	YRLASTBR	SCE_ID_FLD	SCE_ID_VAL
57	natural	confirmed	2000	2000	DBNO	9751

Appendix: NatureMap Database Search Results

TAXON	CLASS	WA CONS
Acanthagenys rufogularis	BIRD	
Acanthiza apicalis	BIRD	
Acanthiza chrysorrhoa	BIRD	
Acanthiza inornata	BIRD	
Acanthiza uropygialis	BIRD	
Acanthorhynchus superciliosus	BIRD	
Accipiter cirrocephalus	BIRD	
Accipiter cirrocephalus subsp. cirrocephalus	BIRD	
Accipiter fasciatus	BIRD	
Acritoscincus trilineatum	REPTILE	
Acritoscincus trilineatus	REPTILE	
Acrocephalus australis	BIRD	
Actitis hypoleucos	BIRD	MI
Aegotheles cristatus	BIRD	
Aegotheles cristatus subsp. cristatus	BIRD	
Anas castanea	BIRD	
Anas gracilis	BIRD	
Anas platyrhynchos	BIRD	
Anas platyrhynchos subsp. domesticus	BIRD	
Anas rhynchotis	BIRD	
Anas superciliosa	BIRD	
Anhinga novaehollandiae	BIRD	
Anous tenuirostris subsp. melanops	BIRD	EN
Anser anser	BIRD	
Antaresia stimsoni subsp. stimsoni	REPTILE	
Anthochaera carunculata	BIRD	
Anthochaera lunulata	BIRD	
Anthus australis	BIRD	
Anthus australis subsp. australis	BIRD	
Aprasia repens	REPTILE	
Apus pacificus	BIRD	MI
Aquila audax	BIRD	
Aquila morphnoides	BIRD	
Aquila morphnoides subsp. morphnoides	BIRD	
Arctocephalus tropicalis	MAMMAL	VU
Ardea ibis	BIRD	
Ardea ibis subsp. coromanda	BIRD	
Ardea intermedia	BIRD	
Ardea modesta	BIRD	
Ardea novaehollandiae	BIRD	
Ardea pacifica	BIRD	
Ardeotis australis	BIRD	
Artamus cinereus	BIRD	
Artamus cyanopterus	BIRD	
Artamus personatus	BIRD	
Aspidites ramsayi	REPTILE	
Aythya australis	BIRD	
Balaenoptera acutorostrata	MAMMAL	
Barnardius zonarius	BIRD	
Bettongia penicillata ogilbyi ogilbyi	MAMMAL	
Bettongia penicillata subsp. ogilbyi	MAMMAL	CR

Biziura lobata	BIRD	
Botaurus poiciloptilus	BIRD	EN
Brachyurophis fasciolatus subsp. fasciolatus	REPTILE	
Brachyurophis semifasciatus	REPTILE	
Burhinus grallarius	BIRD	
Cacatua galerita	BIRD	
Cacatua galerita subsp. galerita	BIRD	
Cacatua pastinator	BIRD	
Cacatua pastinator subsp. butleri	BIRD	
Cacatua roseicapilla	BIRD	
Cacatua sanguinea	BIRD	
Cacatua sanguinea subsp. westralensis	BIRD	
Cacatua tenuirostris	BIRD	
Cacomantis flabelliformis	BIRD	
Cacomantis flabelliformis subsp. flabelliformis	BIRD	
Cacomantis pallidus	BIRD	
Calamanthus campestris	BIRD	
Calamanthus campestris subsp. montanellus	BIRD	
Calamanthus cautus	BIRD	
Calidris acuminata	BIRD	MI
Calidris canutus	BIRD	EN
Calidris ferruginea	BIRD	CR
Calidris ruficollis	BIRD	MI
Calyptorhynchus banksii	BIRD	
Calyptorhynchus banksii subsp. naso	BIRD	VU
Calyptorhynchus baudinii	BIRD	EN
Calyptorhynchus latirostris	BIRD	EN
Calyptorhynchus latirostris (Carnaby's Cockatoo (short-billed black-cockatoo))	BIRD	
Calyptorhynchus sp.	BIRD	
Calyptorhynchus sp. 'white-tailed black cockatoo'	BIRD	
Canis lupus	MAMMAL	
Canis lupus subsp. dingo	MAMMAL	
Canis lupus subsp. familiaris	MAMMAL	
Carduelis carduelis	BIRD	
Caretta caretta	REPTILE	EN
Carlia munda	REPTILE	
Catharacta antarctica subsp. lonnbergi	BIRD	
Cercartetus concinnus	MAMMAL	
Certhionyx variegatus	BIRD	
Chalinolobus gouldii	MAMMAL	
Charadrius ruficapillus	BIRD	
Chelodina colliei	REPTILE	
Chelodina collieri	REPTILE	
Chelodina oblonga	REPTILE	
Chelonia mydas	REPTILE	VU
Chenonetta jubata	BIRD	
Cheramoeca leucosterna	BIRD	
Chlidonias leucopterus	BIRD	MI
Christinus marmoratus	REPTILE	
Chroicocephalus novaehollandiae	BIRD	
Chrysococcyx basalis	BIRD	
Chrysococcyx lucidus subsp. plagosus	BIRD	
Cincloramphus cruralis	BIRD	
Cincloramphus mathewsi	BIRD	
Circus approximans	BIRD	

Circus assimilis	BIRD	
Cladorhynchus leucocephalus	BIRD	
Climacteris rufa	BIRD	
Colluricincla harmonica	BIRD	
Colluricincla harmonica subsp. rufiventris	BIRD	
Columba livia	BIRD	
Coracina novaehollandiae	BIRD	
Corvus bennetti	BIRD	
Corvus coronoides	BIRD	
Corvus coronoides subsp. perplexus	BIRD	
Coturnix pectoralis	BIRD	
Coturnix ypsilophora	BIRD	
Cracticus nigrogularis	BIRD	
Cracticus tibicen	BIRD	
Cracticus torquatus	BIRD	
Crenadactylus ocellatus	REPTILE	
Crenadactylus ocellatus subsp. ocellatus	REPTILE	
Crinia glauerti	AMPHI	
Crinia pseudinsignifera	AMPHI	
Cryptoblepharus buchananii	REPTILE	
Cryptoblepharus plagiocephalus	REPTILE	
Ctenophorus adelaidensis	REPTILE	
Ctenophorus caudicinctus	REPTILE	
Ctenophorus cristatus	REPTILE	
Ctenophorus maculatus	REPTILE	
Ctenophorus maculatus subsp. griseus	REPTILE	
Ctenophorus ornatus	REPTILE	
Ctenophorus reticulatus	REPTILE	
Ctenophorus salinarum	REPTILE	
Ctenotus australis	REPTILE	
Ctenotus fallens	REPTILE	
Ctenotus impar	REPTILE	
Ctenotus impar Storr, 1969	REPTILE	
Ctenotus pantherinus	REPTILE	
Ctenotus pantherinus subsp. pantherinus	REPTILE	
Ctenotus saxatilis	REPTILE	
Ctenotus schomburgkii	REPTILE	
Cyclodomorphus celatus	REPTILE	
Cygnus atratus	BIRD	
Dacelo novaeguineae	BIRD	
Daphoenositta chrysoptera	BIRD	
Daphoenositta chrysoptera subsp. pileata	BIRD	
Daption capense	BIRD	
Dasyurus geoffroii	MAMMAL	VU
Delma australis	REPTILE	
Delma australis Kluge, 1974	REPTILE	
Delma concinna subsp. concinna	REPTILE	
Delma fraseri	REPTILE	
Delma fraseri Gray, 1831	REPTILE	
Delma grayii	REPTILE	
Delma pax	REPTILE	
Demansia psammophis subsp. cupreiceps	REPTILE	
Demansia psammophis subsp. reticulata	REPTILE	
Dendrocygna eytoni	BIRD	
Dermochelys coriacea	REPTILE	VU

Dicaeum hirundinaceum	BIRD	
Diomedea chlororhynchos	BIRD	
Diomedea chlororhynchos subsp. carteri	BIRD	
Diomedea chrysostoma	BIRD	
Diplodactylus calcicolus	REPTILE	
Diplodactylus granariensis Storr, 1979	REPTILE	
Diplodactylus granariensis subsp. granariensis	REPTILE	
Diplodactylus polyophthalmus	REPTILE	
Diplodactylus pulcher	REPTILE	
Diplodactylus savagei	REPTILE	
Diplodactylus sp.	REPTILE	
Diporiphora valens	REPTILE	
Dromaius novaehollandiae	BIRD	
Drymodes brunneopygia	BIRD	
Echiopsis curta	REPTILE	
Egernia kingii	REPTILE	
Egernia napoleonis	REPTILE	
Egretta garzetta	BIRD	
Egretta novaehollandiae	BIRD	
Egretta sacra	BIRD	
Elanus axillaris	BIRD	
Elanus caeruleus	BIRD	
Elanus caeruleus subsp. axillaris	BIRD	
Elapognathus coronatus	REPTILE	
Elseyornis melanops	BIRD	
Eolophus roseicapillus	BIRD	
Eopsaltria georgiana	BIRD	
Eopsaltria griseogularis	BIRD	
Epthianura albifrons	BIRD	
Epthianura tricolor	BIRD	
Erythrogonys cinctus	BIRD	
Eubalaena australis	MAMMAL	VU
Eurostopodus argus	BIRD	
Falco berigora	BIRD	
Falco cenchroides	BIRD	
Falco cenchroides subsp. cenchroides	BIRD	
Falco longipennis	BIRD	
Falco peregrinus	BIRD	OS
Falco peregrinus subsp. macropus	BIRD	
Falcunculus frontatus subsp. leucogaster	BIRD	
Felis catus	MAMMAL	
Fulica atra	BIRD	
Fulica atra subsp. australis	BIRD	
Gallinula tenebrosa	BIRD	
Gallinula tenebrosa subsp. tenebrosa	BIRD	
Gallinula ventralis	BIRD	
Gallirallus philippensis	BIRD	
Gallirallus philippensis subsp. mellori	BIRD	
Gavicalis virescens	BIRD	
Gehyra variegata	REPTILE	
Gerygone fusca	BIRD	
Gerygone fusca subsp. fusca	BIRD	
Glossopsitta porphyrocephala	BIRD	
Glyciphila melanops	BIRD	
Grallina cyanoleuca	BIRD	

Haematopus fuliginosus	BIRD	
Haliaeetus leucogaster	BIRD	
Haliastur sphenurus	BIRD	
Halobaena caerulea	BIRD	
Hamirostra isura	BIRD	
Heleioporus albopunctatus	AMPHI	
Heleioporus albopunctatus Gray, 1841	AMPHI	
Hemiergis peronii	REPTILE	
Hemiergis quadrilineata	REPTILE	
Hesperoedura reticulata	REPTILE	
Heteronotia binoei	REPTILE	
Hieraaetus morphnoides	BIRD	
Himantopus himantopus	BIRD	
Hirundo neoxena	BIRD	
Hirundo nigricans	BIRD	
Hydromys chrysogaster	MAMMAL	P4
Hydrophis platurus	REPTILE	
Hydroprogne caspia	BIRD	MI
Hydrurga leptonyx	MAMMAL	
Hylacola cauta	BIRD	
Hylacola cauta subsp. whitlocki	BIRD	
Isoodon fusciventer	MAMMAL	P4
Isoodon fusciventer (Quenda)	MAMMAL	
Isoodon obesulus	MAMMAL	
Isoodon obesulus fusciventer	MAMMAL	
Isoodon obesulus fusciventer fusciventer	MAMMAL	
Isoodon obesulus subsp. fusciventer	MAMMAL	
Ixobrychus dubius	BIRD	P4
Ixobrychus flavicollis subsp. australis (southwest subpop.)	BIRD	
Ixobrychus minutus	BIRD	
Ixobrychus minutus subsp. dubius	BIRD	
Kogia breviceps	MAMMAL	
Lagostrophus fasciatus	MAMMAL	
Lagostrophus fasciatus subsp. fasciatus	MAMMAL	VU
Larus novaehollandiae	BIRD	
Larus novaehollandiae subsp. novaehollandiae	BIRD	
Larus pacificus	BIRD	
Leipoa ocellata	BIRD	VU
Lerista distinguenda	REPTILE	
Lerista elegans	REPTILE	
Lerista jacksoni	REPTILE	
Lerista lineopunctulata	REPTILE	
Lerista macropisthopus subsp. macropisthopus	REPTILE	
Lerista praepedita	REPTILE	
Lialis burtonis	REPTILE	
Lichenostomus cratitius	BIRD	
Lichenostomus leucotis	BIRD	
Lichenostomus leucotis subsp. novaenorciae	BIRD	
Lichenostomus ornatus	BIRD	
Lichenostomus virescens	BIRD	
Lichmera indistincta	BIRD	
Limosa haemastica	BIRD	
Limosa lapponica	BIRD	MI
Limosa limosa	BIRD	MI
Liopholis multiscutata	REPTILE	

Lonchura castaneothorax	BIRD	
Lophoictinia isura	BIRD	
Lucasium maini	REPTILE	
Lucasium stenodactylum	REPTILE	
Lucasium wombeyi	REPTILE	
Macronectes giganteus	BIRD	MI
Macropus eugenii subsp. derbianus	MAMMAL	
Macropus eugeniii	MAMMAL	
Macropus fuliginosus	MAMMAL	
Macropus irma	MAMMAL	
Macrotis lagotis	MAMMAL	VU
Malacorhynchus membranaceus	BIRD	
Malurus elegans	BIRD	
Malurus lamberti	BIRD	
Malurus leucopterus	BIRD	
Malurus pulcherrimus	BIRD	
Malurus sp.	BIRD	
Malurus splendens	BIRD	
Manorina flavigula	BIRD	
Megalurus cruralis	BIRD	
Megalurus gramineus	BIRD	
Megaptera novaeangliae	MAMMAL	CD
Melanodryas cucullata	BIRD	
Melithreptus brevirostris	BIRD	
Melithreptus brevirostris subsp. leucogenys	BIRD	
Melithreptus lunatus	BIRD	
Melopsittacus undulatus	BIRD	
Menetia greyii	REPTILE	
Menetia greyii Gray, 1845	REPTILE	
Merops ornatus	BIRD	
Mesoplodon densirostris	MAMMAL	
Microcarbo melanoleucos	BIRD	
Microeca fascinans	BIRD	
Mirounga leonina	MAMMAL	
Moloch horridus	REPTILE	
Morelia spilota subsp. imbricata	REPTILE	
Morethia butleri	REPTILE	
Morethia lineoocellata	REPTILE	
Morethia obscura	REPTILE	
Morethia obscura Storr, 1973	REPTILE	
Morethia ruficauda	REPTILE	
Morus serrator	BIRD	
Motacilla alba	BIRD	
Mus musculus	MAMMAL	
Mus musculus Linnaeus, 1758	MAMMAL	
Myiagra inquieta	BIRD	
Myobatrachus gouldii	AMPHI	
Myrmecobius fasciatus	MAMMAL	EN
Natator depressus	REPTILE	VU
Neelaps bimaculatus	REPTILE	
Neelaps calonotos	REPTILE	P3
Neobatrachus albipes	AMPHI	
Neobatrachus albipes Roberts, Mahony, Kendrick and Majors, 1991	AMPHI	
Neobatrachus kunapalari	AMPHI	
Neobatrachus kunapalari Mahony and Roberts, 1986	AMPHI	

Neobatrachus pelobatoides	AMPHI	
Neophema elegans	BIRD	
Neophoca cinerea	MAMMAL	VU
Ningaui timealeyi	MAMMAL	
Ninox connivens	BIRD	
Ninox novaeseelandiae	BIRD	
Ninox novaeseelandiae subsp. boobook	BIRD	
Notamacropus eugenii subsp. derbianus	MAMMAL	P4
Notamacropus irma	MAMMAL	P4
Notechis scutatus	REPTILE	
Notomys mitchellii	MAMMAL	
Notoscincus ornatus	REPTILE	
Nycticorax caledonicus	BIRD	
Nyctophilus geoffroyi	MAMMAL	
Nymphicus hollandicus	BIRD	
Oceanites marinus subsp. dulciae	BIRD	
Oceanites oceanicus	BIRD	MI
Ocyphaps lophotes	BIRD	
Oedura obscura	REPTILE	
Oreoica gutturalis	BIRD	
Oreoica gutturalis subsp. gutturalis	BIRD	
Oryctolagus cuniculus	MAMMAL	
Oxyura australis	BIRD	P4
Pachycephala pectoralis	BIRD	
Pachycephala pectoralis subsp. fuliginosa	BIRD	
Pachycephala rufiventris	BIRD	
Pachycephala rufiventris subsp. rufiventris	BIRD	
Pachyptila belcheri	BIRD	
Pachyptila desolata	BIRD	
Pachyptila salvini	BIRD	
Pandion cristatus	BIRD	MI
Pandion haliaetus	BIRD	
Pandion haliaetus subsp. cristatus	BIRD	
Parasuta gouldii	REPTILE	
Parasuta nigriceps	REPTILE	
Pardalotus punctatus	BIRD	
Pardalotus striatus	BIRD	
Pardalotus striatus subsp. westraliensis	BIRD	
Passer domesticus	BIRD	
Passer domesticus subsp. domesticus	BIRD	
Pelecanus conspicillatus	BIRD	
Petrochelidon ariel	BIRD	
Petrochelidon nigricans	BIRD	
Petrogale lateralis subsp. lateralis	MAMMAL	EN
Petroica boodang	BIRD	
Petroica goodenovii	BIRD	
Petroica multicolor subsp. campbelli	BIRD	
Phalacrocorax carbo	BIRD	
Phalacrocorax melanoleucos	BIRD	
Phalacrocorax sulcirostris	BIRD	
Phalacrocorax varius	BIRD	
Phaps chalcoptera	BIRD	
Phascogale calura	MAMMAL	CD
Phoebetria sp.	BIRD	
Phylidonyris niger	BIRD	

Phylidonyris nigra	BIRD	
Phylidonyris nigra subsp. gouldii	BIRD	
Phylidonyris novaehollandiae	BIRD	
Planigale ingrami	MAMMAL	
Planigale maculata	MAMMAL	
Platalea flavipes	BIRD	
Platalea regia	BIRD	
Platycercus icterotis	BIRD	
Platycercus icterotis subsp. xanthogenys	BIRD	P4
Platycercus spurius	BIRD	
Platycercus varius	BIRD	
Platycercus zonarius	BIRD	
Platycercus zonarius subsp. semitorquatus	BIRD	
Platycercus zonarius subsp. zonarius	BIRD	
Plegadis falcinellus	BIRD	MI
Pletholax gracilis subsp. gracilis	REPTILE	
Pluvialis fulva	BIRD	MI
Podargus strigoides	BIRD	
Podargus strigoides subsp. brachypterus	BIRD	
Podiceps cristatus	BIRD	
Podiceps cristatus subsp. australis	BIRD	
Pogona minor	REPTILE	
Pogona minor subsp. minima	REPTILE	VU
Pogona minor subsp. minor	REPTILE	
Poliocephalus poliocephalus	BIRD	
Polytelis anthopeplus	BIRD	
Polytelis swainsonii	BIRD	
Pomatostomus superciliosus	BIRD	
Pomatostomus superciliosus subsp. ashbyi	BIRD	
Porphyrio porphyrio	BIRD	
Porphyrio porphyrio subsp. bellus	BIRD	
Porzana fluminea	BIRD	
Porzana pusilla	BIRD	
Porzana tabuensis	BIRD	
Procellaria aequinoctialis	BIRD	VU
Pseudechis australis	REPTILE	
Pseudomys albocinereus	MAMMAL	
Pseudomys delicatulus	MAMMAL	
Pseudomys desertor	MAMMAL	
Pseudomys occidentalis	MAMMAL	P4
Pseudonaja affinis	REPTILE	
Pseudonaja affinis (Dugite)	REPTILE	
Pseudonaja affinis subsp. affinis	REPTILE	
Pseudonaja affinis subsp. exilis	REPTILE	P4
Pseudonaja mengdeni	REPTILE	
Pseudonaja modesta	REPTILE	
Pseudophryne guentheri	AMPHI	
Pseudophryne guentheri Boulenger, 1882	AMPHI	
Pseudophryne occidentalis	AMPHI	
Pterodroma brevirostris	BIRD	
Pterodroma lessonii	BIRD	
Pterodroma macroptera	BIRD	
Ptilotula ornatus	BIRD	
Puffinus assimilis subsp. assimilis	BIRD	
Purnella albifrons	BIRD	

Purpureicephalus spurius	BIRD	
Pygopus lepidopodus	REPTILE	
Pyrrholaemus brunneus	BIRD	
Ramphotyphlops australis	REPTILE	
Ramphotyphlops bituberculatus	REPTILE	
Ramphotyphlops hamatus	REPTILE	
Ramphotyphlops pinguis	REPTILE	
Ramphotyphlops waitii	REPTILE	
Rattus fuscipes	MAMMAL	
Rattus rattus	MAMMAL	
Recurvirostra novaehollandiae	BIRD	
Rhipidura albiscapa	BIRD	
Rhipidura fuliginosa	BIRD	
Rhipidura leucophrys	BIRD	
Rhipidura leucophrys subsp. leucophrys	BIRD	
Rhynchoedura ornata	REPTILE	
Sericornis frontalis	BIRD	
Sericornis frontalis subsp. maculatus	BIRD	
Simoselaps bertholdi	REPTILE	
Simoselaps bertholdii	REPTILE	
Smicrornis brevirostris	BIRD	
Sminthopsis crassicaudata	MAMMAL	
Sminthopsis dolichura	MAMMAL	
Sminthopsis dolichura Kitchener, Stoddart and Henry, 1984	MAMMAL	
Sminthopsis gilberti	MAMMAL	
Sminthopsis granulipes	MAMMAL	
Sminthopsis granulipes Troughton, 1932	MAMMAL	
Sminthopsis macroura	MAMMAL	
Stercorarius antarcticus	BIRD	
Stercorarius longicaudus	BIRD	MI
Sterna anaethetus subsp. anaethetus	BIRD	
Sterna bergii	BIRD	
Sterna fuscata subsp. nubilosa	BIRD	
Sterna nereis subsp. nereis	BIRD	
Sterna paradisaea	BIRD	
Sternula nereis	BIRD	
Stictonetta naevosa	BIRD	
Strepera versicolor	BIRD	
Streptopelia chinensis	BIRD	
Streptopelia senegalensis	BIRD	
Strophurus michaelseni	REPTILE	
Strophurus spinigerus	REPTILE	
Strophurus spinigerus subsp. inornatus	REPTILE	
Strophurus spinigerus subsp. spinigerus	REPTILE	
Suta fasciata	REPTILE	
Tachybaptus novaehollandiae	BIRD	
Tachyglossus aculeatus	MAMMAL	
Tadarida australis	MAMMAL	
Tadorna tadornoides	BIRD	
Tarsipes rostratus	MAMMAL	
Tarsipes rostratus Gervais and Verraux, 1842	MAMMAL	
Thalassarche cauta	BIRD	
Thalasseus bergii	BIRD	MI
Threskiornis molucca	BIRD	
Threskiornis spinicollis	BIRD	

Tiliqua occipitalis	REPTILE	
Tiliqua rugosa	REPTILE	
Tiliqua rugosa rugosa	REPTILE	
Tiliqua rugosa subsp. aspera	REPTILE	
Tiliqua rugosa subsp. rugosa	REPTILE	
Todiramphus sanctus	BIRD	
Todiramphus sanctus subsp. sanctus	BIRD	
Tribonyx ventralis	BIRD	
Trichoglossus haematodus	BIRD	
Trichoglossus haematodus subsp. moluccanus	BIRD	
Trichoglossus moluccanus	BIRD	
Trichosurus vulpecula	MAMMAL	
Trichosurus vulpecula subsp. vulpecula	MAMMAL	
Tringa glareola	BIRD	MI
Tringa nebularia	BIRD	MI
Tringa stagnatilis	BIRD	MI
Turnix varius	BIRD	
Tursiops truncatus	MAMMAL	
Tyto alba subsp. delicatula	BIRD	
Tyto novaehollandiae subsp. novaehollandiae	BIRD	P3
Underwoodisaurus milii	REPTILE	
Vanellus miles	BIRD	
Vanellus tricolor	BIRD	
Varanus gouldii	REPTILE	
Varanus rosenbergi	REPTILE	
Varanus tristis	REPTILE	
Vespadelus regulus	MAMMAL	
Vulpes vulpes	MAMMAL	
Vulpes vulpes (Red Fox)	MAMMAL	
Xenus cinereus	BIRD	MI
Zosterops lateralis	BIRD	
Zosterops lateralis subsp. gouldi	BIRD	

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 22-Jun-2023

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	13
Listed Migratory Species:	6

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	9
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	2
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Eucalypt Woodlands of the Western Australian Wheatbelt	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

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

Scientific Name	Threatened Category	Presence Text
BIRD		
Aphelocephala leucopsis		
Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Falco hypoleucos		
Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata		
Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Zanda latirostris listed as Calyptorhynchus latirostris		
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding likely to occur within area
MAMMAL		
Dasyurus geoffroii		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phascogale calura		
Red-tailed Phascogale, Red-tailed Wambenger, Kenngoor [316]	Vulnerable	Species or species habitat likely to occur within area
PLANT		
Banksia sphaerocarpa var. dolichostyla		
Ironcaps Banksia, Ironcap Banksia [10518]	Vulnerable	Species or species habitat may occur within area
Eremophila resinosa		
Resinous Eremophila [11735]	Endangered	Species or species habitat may occur within area
Eremophila viscida		
Varnish Bush [2394]	Endangered	Species or species habitat may occur within area
Gastrolobium diabolophyllum		
Bodallin Poison [78384]	Critically Endangered	Species or species habitat may occur within area
Roycea pycnophylloides		
Saltmat [21161]	Endangered	Species or species habitat likely to occur within area
Symonanthus bancroftii		
Bancrofts Symonanthus [12837]	Endangered	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Chalcites osculans as Chrysococcyx osculans		
Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State
Emu Hill	Nature Reserve	WA
South Kumminin	Nature Reserve	WA

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner)			
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Please feel free to provide feedback via the Contact us page.

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Appendix I Fauna Habitat Assessment

Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

SLR Project No.: 675.VX5781.00001

October 31, 2024

6004-HAB-01-SG

Project:	6004				
Date	4-07-2023		**Sample Type**		
Zone	50	**Easting**	625756	**Northing**	6435920
Landform and Soil			**Rock**		
Landform	Plain		**Rock type/s**	Unknown	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**		
Soil colour	Orange,Red				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Peeling bark,Woody debris	
Disturbance	Clearing,Infrastructure,Weeds				
Introduced fauna	None observed		**Ground Cover**	<10%	
Vegetation					
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	*Eucalyptus spp.*		
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Isolated grasses (<0.25%)			

Fulcrum photo ID	8fa242a1-d349-45c5-90e7-d5f35d701924

6004-HAB-02-SG

Project:	6004				
Date	5-07-2023		**Sample Type**		
Zone	50	**Easting**	629842	**Northing**	6448107.1
Landform and Soil			**Rock**		
Landform	Plain		**Rock type/s**	Unknown	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**		
Soil colour	Brown,Orange				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Unknown		**Microhabitats**	Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	Clearing,Litter,Vehicle tracks,Weeds				
Introduced fauna	None observed		**Ground Cover**	<10%	
Vegetation					
Upper stratum	Mid (10-30 m)	Isolated trees (<0.25%)	*Eucalyptus spp.*		
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Open grassland (20-50%)	*Poaceae spp.*		

Fulcrum photo ID	99be7d84-e7aa-46e9-bffa-88e6491687e4

6004-HAB-03-SG

Project:	6004				
Date	5-07-2023		**Sample Type**		
Zone	50	**Easting**	629478	**Northing**	6447529

Landform and Soil		**Rock**	
Landform	Plain	**Rock type/s**	Unknown
Aspect	Negligible	**Surface stone cover**	0 - 5%
Soil type	Sandy loam	**Surface stone size classes present**	
Soil colour	Brown,Orange		
Condition		**Habitat Features**	
Quality	Highly degraded	**Water Source**	Absent
Fire History	Unknown	**Microhabitats**	tussocks
Disturbance	Clearing,Erosion,Litter,Overgrazing,Vehicle tracks,Weeds		
Introduced fauna	Sheep	**Ground Cover**	26-50%

Vegetation			
Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Sparse tussock grassland (0.25-20%)	

Fulcrum photo ID	19341ae4-0140-4a1c-9d06-788ee59a9e72

3

6004-HAB-04-SG

Project:	6004				
Date	5-07-2023		**Sample Type**		
Zone	50	**Easting**	629324	**Northing**	6447363.8

Landform and Soil		**Rock**	
Landform	Plain	**Rock type/s**	Unknown
Aspect	Negligible	**Surface stone cover**	0 - 5%
Soil type	Sandy loam	**Surface stone size classes present**	
Soil colour	Brown,Orange		
Condition		**Habitat Features**	
Quality	Good	**Water Source**	Absent
Fire History	Unknown	**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Disturbance	Clearing,Litter,Vehicle tracks,Weeds		
Introduced fauna	None observed	**Ground Cover**	<10%

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus spp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Santalum acuminatum, teatree, melaleuca sp., young euc spp.*
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Dianella revoluta, lepidosperma sp., sedges and grasses*

Fulcrum photo ID	50f22ab9-2e33-4e3e-aedd-3a7887978566

6004-HAB-05-SG

Project:	6004				
Date	5-07-2023		**Sample Type**		
Zone	50	**Easting**	629121	**Northing**	6447221

Landform and Soil		**Rock**	
Landform	Plain	**Rock type/s**	Sandstone
Aspect	Negligible	**Surface stone cover**	0 - 5%
Soil type	Sandy loam	**Surface stone size classes present**	Stones (2 - 6 cm)
Soil colour	Brown		
Condition		**Habitat Features**	
Quality	Disturbed	**Water Source**	Absent
Fire History	Unknown	**Microhabitats**	Leaf litter,Woody debris
Disturbance	Clearing,Litter,Vehicle tracks,Weeds		
Introduced fauna	None observed	**Ground Cover**	<10%

Vegetation			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)	*Teatree, Santalum acuminatum, Grevillea spp. Acacia spp.*
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Dianella revoluta, Endopogon spp., sedges and grasses*

Fulcrum photo ID	f42341cd-bbb0-4181-81ec-d4933cdd9807

Appendix J Fauna Inventory

Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

SLR Project No.: 675.VX5781.00001

October 31, 2024

Conservation Status: State - Listed under Biodiversity Conservation Act 2016, Federal - Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR - Critically Endangered, EN - Endangered, VU - Vulnerable, MI/IA - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Listed as Priority by DBCA. * - Introduced species

Family	Scientific Name	Common Name	Conservation Status		Method				
			State	Federal	Call	Sighitng	Scat	Sighting - Overhead	Total
Aves									
Corvidae	*Corvus coronoides*	Australian Raven				1			**1**
	Corvus bennetti	Little Crow				3			**3**
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike		MA		3			**3**
Psittaculidae	*Barnardius zonarius*	Australian Ringneck			3	11			**14**
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail			3				**3**
Artamidae	*Gymnorhina tibicen*	Australian Magpie			1				**1**
Cacatuidae	*Eolophus roseicapilla*	Galah						5	**5**
Acanthizidae	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill				5			**5**
	Smicrornis brevirostris	Weebill				10			**10**
Falconidae	*Falco cenchroides*	Nankeen Kestral		MA				1	**1**
Mammalia									
Canidae	*Canis lupus*	Dingo / Dog*					1		**1**
Reptilia									
Gekkonidae	*Gehyra variegata*	Variegated Gehyra				1			**1**

Appendix K Flora Likelihood, Southern Area

Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

SLR Project No.: 675.VX5781.00001

October 31, 2024

SLR

Appendix/Table x: Assessment of the Likelihood of Occurrence of Threatened and Priority Flora as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2022 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 20 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing. 1: Department of the Environment (2021). SPRAT EPBC Threatened Flora in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. 2: Department of Biodiversity, Conservation and Attractions (2021). FloraBase - TheWestern Australian Flora. https://florabase.dpaw.wa.gov.au/

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Pre-Survey Likelihood of Occurrence	Habitat occurs within the Survey Area	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Threatened											
Boronia capitata subsp. capitata	T	EN	X		X	19.8 km	Aug - Feb	Below lateritic breakaways in a white sandplain.[1]	Low	No	Low
Conospermum galeatum	T	CR	X		X	22.5 km	Aug - Sep	Yellow sand.	Low	No	Low
Rhizanthella gardneri	T	CR	X		X	32.7 km	May - Jul	Sand. Grows in association with Melaleuca uncinata.[2]	Low	No	Low
Symonanthus bancroftii	T	EN	X	X	X	19.5 km	Jul - Sep	Moist, grey clay over granite. Mid-lower slope, edges of ephemeral wetland. Disturbed areas.[2]	Low	No	Low
Priority 1											
Acacia sclerophylla var. teretiuscula	P1				X	26.1 km	Sep - Oct	Clay and loamy soils.[2]	Low	No	Low
Acacia tetraneura	P1				X	6.3 km	May - Jul	Clay & lateritic gravel. Ridges & low rises.[2]	Medium	No	Low
Acacia torticarpa	P1				X	6.7 km	Aug	Grey/brown sand/gravel. Plains.[2]	Medium	No	Low
Dampiera scaevolina	P1				X	3.6 km	Sep - Nov	Sandy & gravelly soils.[2]	High	No	Low
Gastrolobium tenue	P1				X	23.5 km	Sep - Oct	Yellow sand or sandy clay. Undulating dunes, stony outcrops.[2]	Low	No	Low
Hibbertia sp. Bendering (J.W. Horn 4101)	P1				X	22.2 km	Sep	Laterite over duricrust.[2]	Low	No	Low
Melaleuca grieveana	P1				X	32.1 km	Jul	Well-drained orange-brown loam, brown clay. Plains, gentle slopes, edge of crop paddocks.[2]	Low	No	Low
Melaleuca manglesii	P1				X	36.0 km	Sep	White sand.[2]	Low	No	Low
Melichrus sp. Bruce Rock (J. Buegge D 36)	P1				X	28.4 km	Unkown	Gentle slope, dry, bare brown-red gravel.[2]	Low	No	Low
Scaevola tortuosa	P1				X	39.9 km	Oct	Sandy clay. Margins of salt lakes.[2]	Low	No	Low

[1] Department of Agriculture, Water and Environment (2023) [2]Western Australian Herbarium (2023)

Priority 2											
Acacia lirellata subsp. compressa	P2				X	34.9 km	Jun - Aug	Yellow sand, clayey loam. Sandplains.[2]	Low	No	Low
Austrobaeckea narembeen	P2		X		X	23.5 km	Nov - Mar	Light brown silty to clayey fine to coarse sand over granite (outcropping in places).[2]	Low	No	Low
Banksia splendida subsp. splendida	P2				X	14.9 km	Jul - Sep	Sandy and loamy soils with lateritic gravel.[2]	Medium	No	Low
Calytrix sagei	P2				X	14.9 km	Dec	Low plain - gently undulating plain. Grey brown sandy clay soil with underlying granite.[2]	Medium	No	Low
Conostylis albescens	P2				X	36.0 km	Aug	Yellow sand. Sandplains.[2]	Low	No	Low
Eutaxia hirsuta	P2				X	35.6 km	Oct	Dry, white/brown sandy clay plains.[2]	Low	No	Low
Hibbertia chartacea	P2				X	33.7 km	Sep	Sand, laterite. Sandplain with breakaways.[2]	Low	No	Low
Microcorys sp. Tarin Rock (E.J. Croxford 525	P2				X	30.3 km	Oct	Sandy gravel, sandplains.[2]	Low	No	Low
Ricinocarpos tuberculatus	P2				X	24.0 km	Sep - Oct	White/grey sand. Coastal dunes.[2]	Low	No	Low
Verticordia multiflora subsp. solox	P2				X	35.5 km	Oct - Jan	Yellow sand over gravel, sand over granite.[2]	Low	No	Low
Priority 3											
Acacia ancistrophylla var. perarcuata	P3		X			32.6 km	Aug - Sep	Red sand, clay loam, loam. Undulating plains.[2]	Low	No	Low
Acacia deflexa	P3				X	12.5 km	Aug - Sep	Yellow, gravelly lateritic sand, gravelly sandy loam, plains.[2]	Medium	No	Low
Acacia eremophila var. variabilis	P3				X	30.1 km	Sep	Sand, sandy loam.[2]	Low	No	Low
Acacia inophloia	P3				X	4.9 km	Aug - Oct	Yellow sand, gravelly granitic soils.[2]	High	No	Low
Anticoryne melanosperma	P3				X	19.5 km	Sep - Dec	Brown sand/loam, gravel. Undulating plains.[2]	Medium	No	Low
Austrostipa nunaginensis	P3				X	18.5 km	Unkown	Yellow brown sands.[2]	Medium	No	Low
Balaustion exsertum	P3		X			32.5 km	Sep	Brown sand/loam/clay.[2]	Low	No	Low
Banksia horrida	P3				X	15.4 km	Apr - Jun or Aug	Sand, sometimes with gravel.[2]	Medium	No	Low
Banksia rufa subsp. chelomacarpa	P3				X	38.4 km	Jul -Oct	Sandy loam over gravel.[2]	Low	No	Low

[1] Department of Agriculture, Water and Environment (2023) [2]Western Australian Herbarium (2023)

Banksia rufa subsp. obliquiloba	P3				X	17.1 km	Sep - Oct	Gravelly loam.[2]	Medium	No	Low
Banksia xylothemelia	P3				X	22.1 km	Sep - Oct	Sandy loam, usually over laterite. Sandplains.[2]	Low	No	Low
Calytrix nematoclada	P3				X	17.1 km	Sep - Jan	Yellow or grey sand. Sandplains.[2]	Medium	No	Low
Cryptandra dielsii	P3				X	36.0 km	Jul - Sep	Sand, often over laterite. Sandplains.[2]	Low	No	Low
Daviesia nudiflora subsp. drummondii	P3				X	10.5 km	Jul - Aug	White or grey sand. Undulating low rises.[2]	Medium	No	Low
Dicrastylis reticulata	P3				X	3.7 km	Sep - Dec	Sandy soils, often over granite. Amongst granite rock, hills, flats.[2]	High	No	Low
Dielsiodoxa leucantha subsp. leucantha	P3				X	21.4 km	May - Sep	Dry, rocky, brown loam over quartzite.[2]	Low	No	Low
Eucalyptus erythronema subsp. inornata	P3				X	9.6 km	Aug - Dec	Flat, white sand. Gravelly, grey-brown sandy loam.[2]	Medium	No	Low
Eucalyptus exigua	P3				X	7.1 km	Mar - Apr or Oct or	Sandy loam, white sand. Sandplains.[2]	Medium	No	Low
Eucalyptus ornata	P3				X	21.6 km	Jan	Laterite. Ridges.[2]	Low	No	Low
Eucalyptus spathulata subsp. salina	P3				X	18.9 km	Unkown	Grey-white sand, pale brown sandy clay over granite, saline soils. Flats, broad valley floors, saline depressions, edges salt lakes, rises.[2]	Medium	No	Low
Eucalyptus subangusta subsp. virescens	P3				X	22.0 km	Apr	Yellow sand, white clay.[2]	Low	No	Low
Eutaxia actinophylla	P3				X	20.5 km	Sep to Oct.	Red-brown clay loam, red clay loam over granite, gravel. Small depressions.	Low	No	Low
Frankenia drummondii	P3				X	21.8 km	Oct - Nov	Sand, lake edges.[2]	Low	No	Low

[1] Department of Agriculture, Water and Environment (2023) [2]Western Australian Herbarium (2023)

Appendix L Flora Site Sheets, Southern Area

Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

SLR Project No.: 675.VX5781.00001

October 31, 2024

FLORA SITE SHEET

Project Name Narembeen Biological
Site: NARR01
Location MGA 50 625720 **mE** 6435876 **mN**

Described by: RM
Date: 4-07-2023
Type: Releve

Landform: Plain
Slope: Flat
Rock Type: Gravel
Soil Type: Clay Loam,Sand
Soil Colour: Orange

Vegetation: *Eucalyptus salmonophloia, E. ?eremophila, E. salubris woodland over Marieana brevifolia, Daviesia aphylla and Sclerolaeana diacantha low sparse shrubland over Eriachne ?ovata and Austrostipa elegantissima low sparse grassland.*

Condition: Good **Disturbance Type:**
Fire Age: Long unburnt

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex semibaccata	5	0.1	NARR01-6
Austrostipa elegantissima	40	0.5	NARR01-5
Daviesia aphylla	60	1	NARR01-10
Eriachne ? ovata	30	0.5	NARR01-3
Eucalyptus ?eremophila	500	3	NARR01-11
Eucalyptus salmonophloia	700	40	NARR01-1
Eucalyptus salubris	450	3	NARR01-9
Maireana suadifolia	70	0.5	NARR01-8
Marieana brevifolia	70	1.5	NARR01-7
**Poa annua*	10	0.1	NARR01-4
***Raphanus raphanistrum*	40	0.1	
Salsola australis	30	0.1	
Sclerolaeana diacantha	15	1	NARR01-2

FLORA SITE SHEET

Project Name Narembeen Biological
Site: NARR04
Location MGA 50 625709 **mE** 6435867 **mN**

Described by: RM
Date: 4-07-2023
Type: Releve

Landform: Plain
Slope: Flat
Rock Type: Gravel
Soil Type: Loam,Sand
Soil Colour: Orange

Vegetation: *Eucalyptus yilgarnensis low woodland over Santalum acuminatum mid sparse shrubland over Marieana brevifolia, M. suadifolia and Sclerolaeana diacantha low sparse shrubland over Austrostipa elegantissima and Eriachne ?ovata low sparse grassland.*

Condition: Good **Disturbance Type:**
Fire Age: Long unburnt

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia merrallii	70	0.1	RMOPP-5=
Atriplex semibaccata	5	0.1	NARR01-6=
Austrostipa elegantissima	40	0.5	NARR01-5=
Daviesia aphylla	60	1	NARR01-10=
Eriachne ? ovata	30	0.5	NARR01-3=
Eucalyptus yilgarnensis	650	45	RMOPP-6=
Maireana suadifolia	70	0.5	NARR01-8=
Marieana brevifolia	70	1.5	NARR01-7=
**Poa annua*	10	0.1	NARR01-4=
**Raphanus raphanistrum*	40	0.1	
Rhagodia drummondii	60	0.1	
Salsola australis	30	0.1	
Santalum acuminatum	150	5	
Sclerolaeana diacantha	15	1	NARR01-2

Appendix M TEC Assessment Southern Area

Biological Surveys for Shire of Narembeen NVCP Application

Flora, Vegetation, Basic Fauna, and Black Cockatoo Habitat Surveys Biological Report

Shire of Narembeen

SLR Project No.: 675.VX5781.00001

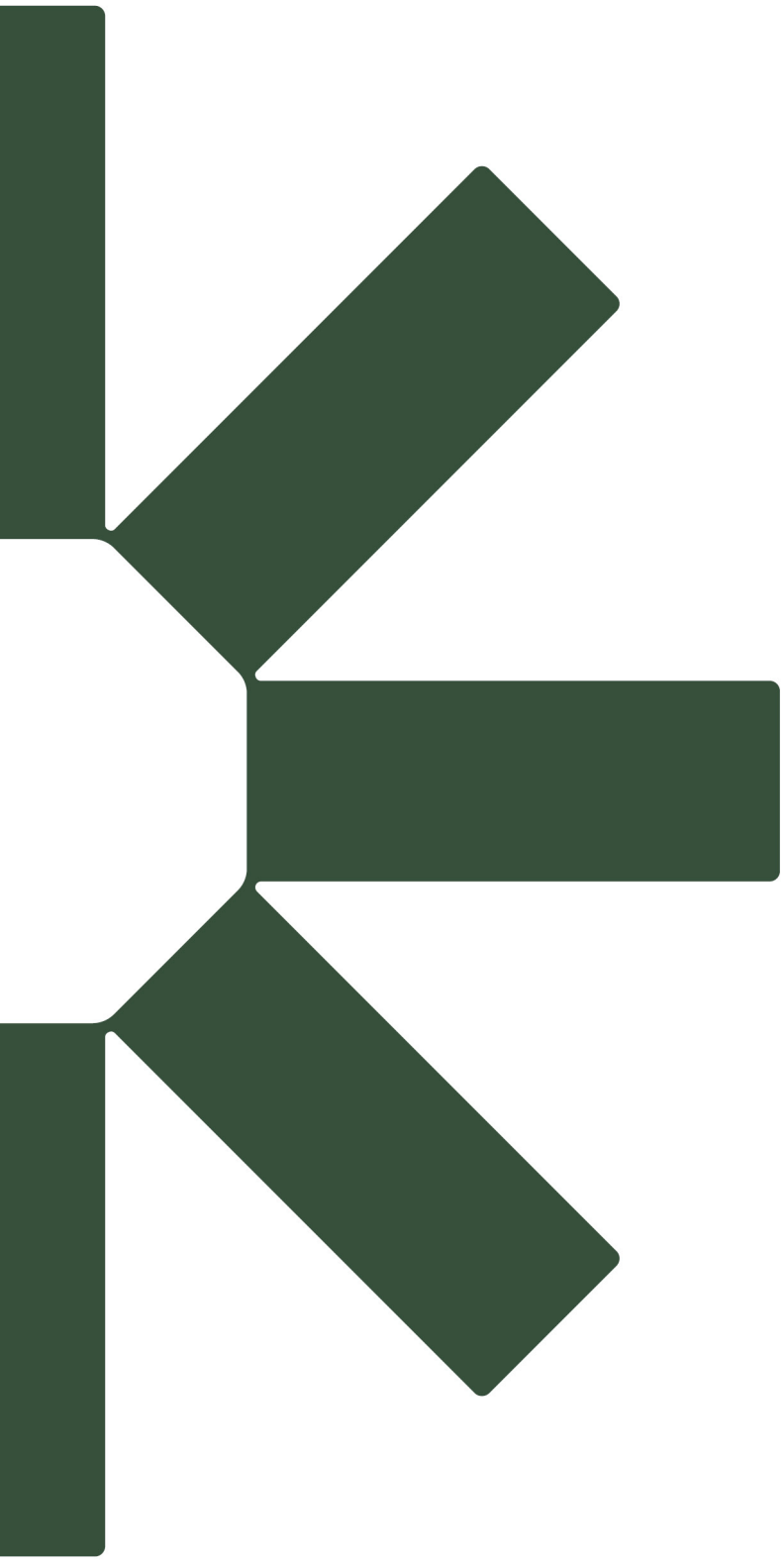
October 31, 2024

Key Diagnostic characteristics for the ecological community TEC Patch #	1	2	3	4	5	6	7	8
1. The distrbution of the ecological community is limited to these IBRA bioregions and subregions:								
Avon Wheatbelt - subregions AVW01 Merredin and AVW02 Katanning								
or								
Mallee - MAL02 Western Mallee only;	✓	✓	✓	✓	✓	✓	✓	✓
or								
Eastern parts of JAF01 Northern Jarrah Forests and JAF02 Jarrah Forests adjacent to the Avon Wheatbelt								
2.The structure of the ecological community is a woodland in which the minimum crown cover of the tree canopy in a mature woodland is 10%.								
>10%	✓	✓	✓	✓	✓	✓	✓	✓
<10%								
3. The key species of the tree canopy are species of Eucalyptus as identified in Table 2a of the Approved Conservation Advice:								
Eucalyptus accedens								
Eucalyptus aequioperta								
Eucalyptus alipes								
Eucalyptus astringens								
Eucalyptus capillosa								
Eucalyptus densa subsp. densa								
Eucalyptus extensa								
Eucalyptus falcata								
Eucalyptus gardneri								
Eucalyptus goniocarpa								
Eucalyptus kondininensis								
Eucalyptus longicornis								
Eucalyptus loxophleba subsp. loxophleba								
Eucalyptus melanoxylon								
Eucalyptus mimica subsp. continens								
Eucalyptus mimica subsp. mimica								

Eucalyptus myriadena								
Eucalyptus occidentalis								
Eucalyptus ornata								
Eucalyptus recta								
Eucalyptus rudis subsp. rudis								
Eucalyptus salicola								
Eucalyptus salmonophloia	✓							
Eucalyptus salubris	✓	✓	✓	✓	✓			
Eucalyptus sargentii subsp. sargentii								
Eucalyptus singularis								
Eucalyptus spathulata subsp. spathulata								
Eucalyptus spathulata subsp. salina Salt								
Eucalyptus urna								
Eucalyptus wandoo subsp. pulverea								
Eucalyptus wandoo subsp. wandoo				✓				
4. A native understorey is present but is of variable composition, being a combination of grasses, other herbs and shrubs, as specified in Table A1 of Appendix A of the Approved Conservation Advice.								
Species present as listed in Table A1?	✓	✓	✓	✓	✓	✓	✓	✓
Species absent as listed in Table A1?								
5. <u>Contra-indicators:</u> The presence of the following features in the vegetation indicates that the ecological community is not likely to be present.								
A dominant presence of eucalypts with a mallee growth form. However, mallee species can occur as an understorey or minor canopy component of the ecological community, as noted in the diagnostic features, above	×	×	×	×	×	✓	✓	✓
A dominant presence of non-eucalypt species in the tree canopy, for instance Acacia acuminata (jam) or Allocasuarina huegeliana (rock sheoak). However, these non-eucalypt species can be present as an understorey or minor canopy component of the ecological community.	×	×	×	×	×	×	×	×

Shrublands or herblands in which the tree canopy layer is very sparse to absent, either naturally or maintained so through long-term disturbance. Native vegetation where a tree canopy was formerly present is often referred to as 'derived' or 'secondary' vegetation. These sites would fall below the 10 per cent minimum canopy cover threshold for a woodland, noted in the diagnostic features, above.	x	x	x	x	x	x	x	x
Woodlands that have the same key eucalypt species but occur in adjacent bioregions	x	x	x	x	x	x	x	x
Woodlands dominated by eucalypts that are restricted to granite outcrops and rocky rises, for instance Eucalyptus caesia.	x	x	x	x	x	x	x	x
6. Condition Thresholds								
Category A:								
1. Patches likely to correspond to a condition of Pristine / Excellent / Very good (Keighery, 1994).	-	-	-	-	-	-	-	-
2. Exotic plant species account for 0 to 30% of total vegetation cover in the understorey layers (i.e. below the tree canopy).	-	-	-	-	-	-	-	-
3. Mature trees (dbh >30cm) may be present or absent.	-	-	-	-	-	-	-	-
4. Minimum patch width (Roadsides only): 5 metres or more.	-	-	-	-	-	-	-	-
Category B:								
1. Patches likely to correspond to a condition of Good (Keighery, 1994).	✓	✓	✓	✓	✓	✓	✓	✓
2. Exotic plant species account for more than 30, to 50% of total vegetation cover in the understorey layers (i.e. below the tree canopy)	✓	✓	✓	✓	✓	✓	✓	✓
3. Mature trees are present with at least 5 trees per 0.5 ha.	✓	✓	✓	✓	✓	✓	✓	✓
4. Minimum patch width (Roadsides only): 5 metres or more.	✓	✓	✓	✓	✓	✓	✓	✓
Category C:								
1. Patches likely to correspond to a condition of Good (Keighery, 1994)	-	-	-	-	-	-	-	-
2. Exotic plant species account for more than 30, to 50% of total vegetation cover in the understorey layers (i.e. below the tree canopy).	-	-	-	-	-	-	-	-
3. Mature trees either absent or less than 5 trees per 0.5 ha present.	-	-	-	-	-	-	-	-
4. Minimum patch width (Roadsides only): 5 metres or more.	-	-	-	-	-	-	-	-

Category D:								
1. Patches likely to correspond to a condition of Degraded to Good (Keighery, 1994)	-	-	-	-	-	-	-	-
2. Exotic plant species account for more than 50 to 70% of total vegetation cover in the understorey layers (i.e. below the tree canopy).	-	-	-	-	-	-	-	-
3. Mature trees are present with at least 5 trees per 0.5 ha.	-	-	-	-	-	-	-	-
4. Minimum patch width (Roadsides only): 5 metres or more.	-	-	-	-	-	-	-	-
7. Outcome								
Criteria met for TEC status? (Yes/No)	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**



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