MINERAL RESOURCES

APPENDIX E

TARGETED FAUNA SURVEY FOR THE LOCKYER DEVELOPMENT PROJECT (PHOENIX 2024)

PHOENIX
ENVIRONMENTAL SCIENCES

Targeted Fauna survey for the Lockyer Development Project

Prepared for Energy Resources Limited

January 2024

Final

Targeted Fauna survey for the Lockyer Development Project

Prepared for Energy Resources Limited

Version history

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EXECUTIVE SUMMARY

Energy Resources Limited (ERL), a wholly owned subsidiary of Mineral Resources Limited, is seeking to develop the Lockyer Development Project (the Project), located approximately 17 km west of Mingenew, Western Australia. Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned to undertake a terrestrial fauna survey for the Project. Data from previous surveys and desktop reviews was used prior to field work to identify significant fauna and habitat that may be present.

Field surveys were undertaken in August 2023. They included breeding habitat and foraging habitat assessments for endangered black cockatoo species, specifically the Carnaby's Black Cockatoo (*Zanda latirostris*) and any other significant species identified in the desktop review such as Malleefowl (*Leipoa ocellata*). The study area consists of many small areas making up 166.65 hectares in total.

The desktop review identified 295 terrestrial fauna species in the vicinity of the study area. This included 36 significant vertebrate species comprising 15 species listed as Threatened, Conservation Dependent or Specially Protected under the EPBC Act and/or BC Act and 21 avifauna species listed as Migratory under both the EPBC Act and BC Act. A further 4 species are listed as Priority by the Department of Biodiversity, Conservation and Attractions.

The desktop review identified records of 6 confirmed short-range endemic invertebrate (SRE) taxa and 20 potential SRE taxa and a further 19 taxa of uncertain SRE status. Land snails, mygalomorph spiders and slaters dominated the SRE assemblage. None are known from within the study area.

Field surveys identified significant fauna species present in the study area, including both vertebrate and SRE fauna. Foraging evidence attributed to Carnaby's Black Cockatoo was observed at site L007. No evidence of breeding or roosting by this species was found during the survey. A total of 529 of the trees were classed as potential nesting trees (PNT) based on them being Eucalypt species with a diameter at breast height (DBH) of ≥300 mm, but not currently containing suitable nest hollows. One was classed as a suitable nesting tree (SNT) as it contained a suitable nesting hollow. However there was no evidence of use by Carnaby's Black Cockatoo, and was occupied by Australian Ringneck Parrots at the time the survey was completed. A total of 37 hollows were recorded across the 529 trees that were of suitable size (PNT and SNT). All these hollows were deemed currently unsuitable for breeding by black cockatoos due to either their small size, or because they were occupied by European honeybees or other hollow nesting birds. It is possible however that they could become available for cockatoos in the future. No evidence of hollow use by any black cockatoo or other large birds was recorded during the survey. While some black cockatoo food plant species were recorded, the study area contains small, fragmented patches of degraded foraging habitat (*Acacia* shrubland containing remnant kwongan species). Active searches for Malleefowl found no evidence of its presence, and habitat assessments found no suitable habitat.

The results highlight the shortcomings of the black cockatoo foraging habitat quality scoring system of DAWE (2022) when applied to a Project such as this one; being largely defined by small, isolated and degraded envelopes of remnant vegetation. In this case, strict adherence to the scoring tool concludes the study area comprises high-quality foraging habitat for Carnaby's Black Cockatoo (7/10). But this isn't the case for the study area; while limited food species were available, they were in poor condition and of low quality and therefore unlikely to be used by Carnaby's Black Cockatoo for foraging. The scoring system for assessing value of vegetation for black cockatoos developed by Bamford takes vegetation condition into consideration and returned a maximum score of 2/10 for the *Acacia* shrubland habitat type. Given the extent of degradation across the study area, this

score appears to be a more accurate representation of the habitat quality for black cockatoos.

Evidence of introduced species such as Red Fox (*Vulpes vulpes*) and Rabbit (*Oryctolagus cuniculus*), as well as weed infestation, litter, erosion channels, historic clearing and access tracks also highlights the degraded nature of the remnants.

Two potential SRE taxa and one likely SRE species were recorded at site L003, containing a mixture of eucalypts and shrubland vegetation. Potential SRE species *Laevophiloscia* '1' has been documented outside of the study area, however *Buddelundia* 'Phoenix0150' (potential) is a potentially new species and *Antichiropus* "DIP232" (likely) is a new species, and their distributions are unknown.

The area does not represent critical breeding habitat for Malleefowl or Carnaby's Black Cockatoo. While 529 PNT were identified, none of these trees currently contain suitable hollows for breeding. It also does not represent critical roosting habitat for Carnaby's Black Cockatoo. Foraging habitat for Carnaby's Black Cockatoo is present, however it is in a highly degraded state, so while Carnaby's Black Cockatoo may utilise the available habitat occasionally, it is unlikely that the study area provides any critical or core habitat.

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ACRONYMS AND ABBREVIATIONS

Abbreviation	Description
BoM	Bureau of Meteorology
CD	Conservation Dependent
CPF	Centralised gas processing facility
DBCA	Department of Biodiversity, Conservation and Attractions
DBH	Diameter at breast height
DCCEEW	Department of Climate Change, Energy, the Environment and Water
EPA	Environmental Protection Authority
EPBC	Environment Protection and Biodiversity Conservation
EIA	Environmental impact assessments
ERL	Energy Resources Limited
ESA	Environmentally Sensitive Areas
IBRA	Interim Biogeographic Regionalisation of Australia
NES	National Environmental Significance
OS	Other specially protected
PNT	Potential nesting trees
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
SRE	Short-range endemic
SP	Specially protected
TEC	Threatened Ecological Community
WA	Western Australia

1 INTRODUCTION

Energy Resources Limited (ERL) is a wholly owned subsidiary of Mineral Resources Limited. ERL is seeking to develop the Lockyer Development Project (the Project), located approximately 17 km west of Mingenew, Western Australia (WA; Figure 1-1). The Project consists of a centralised gas processing facility (CPF) and associated infrastructure within petroleum exploration permit EP368. The total Project area will have a disturbance footprint of up to 105 ha comprising the CPF, gas wells, pipelines and associated infrastructure extending 23 km east-west and 10 km north-south.

In June 2023, Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by ERL to undertake an additional targeted fauna survey for the Project. The purpose of the survey was to survey additional areas following revisions of the central processing facility location and an associated flowline to the southeast which were surveyed by Phoenix in 2022 (Phoenix 2023b).

1.1 BACKGROUND

ERL is planning to develop the CPF and associated infrastructure at the Project within petroleum exploration permit EP368. The CPF is proposed to be located on already cleared farmland which will receive gas from the wells via approximately 30 km of buried pipeline. It is estimated that the route of the pipelines may intersect approximately 5 linear kilometres of native vegetation. The Project is located within the project area of the Rococo and Ringneck Seismic Surveys Ecological Desktop Assessment and Survey (Strategen JBS&G 2021b). Phoenix Environmental Sciences was contracted to conduct detailed flora and targeted fauna surveys for the Project in 2022 (Phoenix 2023b) and is now addressing the request to survey additional areas following revisions of the central processing facility location and an associated flowline to the southeast.

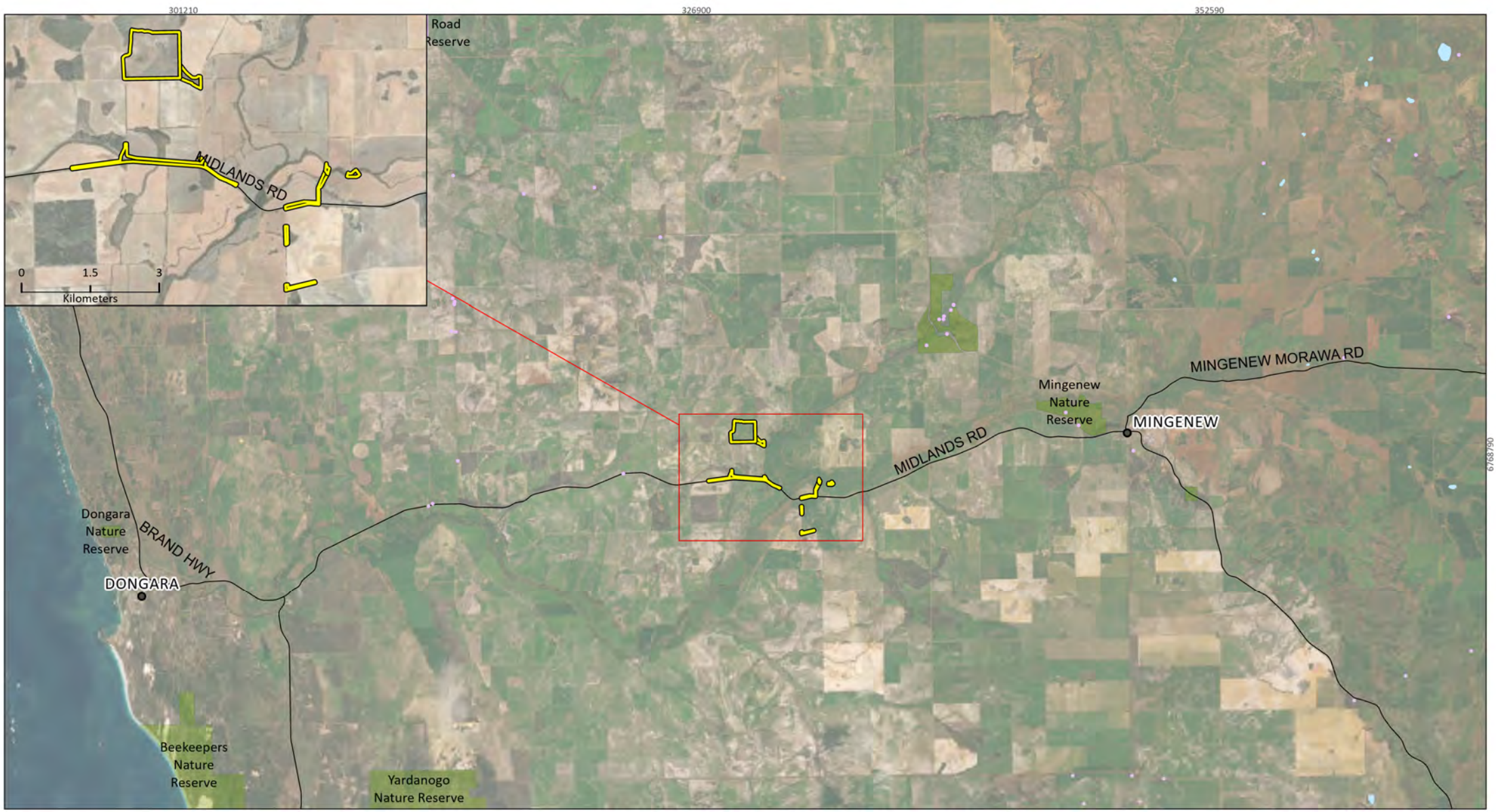
1.2 SCOPE OF WORK

The scope of work for the additional targeted fauna survey was as follows:

- conduct a targeted terrestrial fauna survey, including:
    - targeted searches for conservation significant fauna identified in the desktop review (including black cockatoo and Malleefowl)
    - habitat assessments and mapping of habitat types, extent, condition, and for significant fauna
- conduct an SRE invertebrate survey, including:
    - active searching and litter sieving

1.3 STUDY AREA

The study area for the survey is approximately 166.65 ha and is approximately 17 km west of Mingenew (Figure 1-1). It consists of 6 individual envelopes that are isolated. The largest distance between the envelopes is approximately 5 km. The study area overlaps numerous sites that were previously surveyed during the Phoenix basic and targeted fauna surveys that were conducted in 2022 (Phoenix 2023b).



Strategen-JBS&G
Lockyer Development

Project No	1601
Date	25/10/2023
Drawn by	BK
Map author	KF

0 5 10
Kilometers

1:256,900 (at A4) GDA 1994 MGA Zone 50

- Study area
- DBCA managed land
- Lakes
- Environmentally Sensitive Areas
- Roads

Figure 1-1

Project location and study area

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2 LEGISLATIVE CONTEXT

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

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

The BC Act came into full effect on 1 January 2019 and replaced the functions of the *Wildlife Conservation Act 1950* (WC Act).

2.1 COMMONWEALTH

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

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

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

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

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

2.2 STATE

2.2.1 Threatened and Priority species

In WA, the BC Act provides for the listing of Threatened fauna species (Government of Western Australia 2018a, b)[2] in the following categories:

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

[2] The *Wildlife Conservation (Specially Protected Fauna) Notice 2018* and the *Wildlife Conservation (Rare Flora) Notice 2018* have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation*

- Critically Endangered (CR) – species facing an extremely high risk of extinction in the wild in the immediate future[3]
- Endangered (EN) – species facing a very high risk of extinction in the wild in the near future[3]
- Vulnerable (VU) – species facing a high risk of extinction in the wild in the medium term future[3].

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

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

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

2.2.2 Critical habitat

Under the BC Act, habitat is eligible for listing as critical habitat if it is critical to the survival of a Threatened species or a TEC and its listing is otherwise in accordance with the ministerial guidelines.

2.2.3 Other significant fauna

Under the EPA's environmental factor guidelines, fauna may be considered significant for a range of reasons other than listing as a Threatened or Priority species.

In addition to listing as Threatened or Priority, the EPA (2016a) identifies the following attributes that constitute significant fauna:

- species with restricted distribution (see also section 2.2.4)
- species subject to a degree of historical impact from threatening processes
- providing an important function required to maintain the ecological integrity of a significant ecosystem.

2.2.4 Short-range endemic invertebrates

Short-range endemic (SRE) fauna are defined as animals that display restricted geographic distributions, nominally less than 10,000 km^2, that may also be disjunct and highly localised (Harvey 2002). EPA (2016a) identifies species with restricted distributions as being significant fauna in the context of environmental impact assessments (EIA). SRE fauna need to be considered in EIA as localised, small populations of species that are generally at greater risk of changes in conservation status due to environmental change than other, more widely distributed taxa.

Regulations 2018 to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the BC Act.

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

Short-range endemism in terrestrial invertebrates is believed to have evolved through 2 primary processes (Harvey 2002):

- Relictual – where the drying climate reduced the area of suitable habitat available to a species, forcing a range contraction. Such habitats typically maintain historic mesic conditions (e.g. south-facing rock faces or slopes of mountains or gullies).
- Habitat speciality – where species settled in particular isolated habitat types (e.g. rocky outcrops) by means of dispersal and evolved in isolation into distinct species.

SRE invertebrates have however also been reported in more widespread habitats such as spinifex plains or woodlands, mainly in groups with low dispersal capabilities, for example mygalomorph spiders and millipedes (see for example Car & Harvey 2014; Rix *et al.* 2018).

There can be uncertainty in categorising a specimen as an SRE due to several factors including poor regional survey density, lack of taxonomic research and problems of identification, i.e. specimens that may represent SREs cannot be identified to species level based on the life stage. For example, in contrast to mature males, juvenile and female millipedes, mygalomorph spiders and scorpions cannot be identified to species level. Molecular techniques such as 'barcoding' (Hebert *et al.* 2003a; Hebert *et al.* 2003b) are routinely employed to overcome taxonomic or identification problems.

3 EXISTING ENVIRONMENT

3.1 INTERIM BIOGEOGRAPHIC REGIONALISATION OF AUSTRALIA

The Interim Biogeographic Regionalisation of Australia (IBRA) classifies Australia's landscapes into large 'bioregions' and 'subregions' based on climate, geology, landform, native vegetation and species information (DoEE 2016). The study area is located in the Shire of Irwin and the South-West Botanical Province as defined by the EPA (2016b) / EPA (2020). The study area is located across the intersection of the Leseur Sandplain (GS3) and Geraldton Hills (GS2) subregions of the Geraldton Sandplains bioregions (Figure 3-1).

The Geraldton Sandplains bioregion is characterised by (Desmond A. 2001a, b):

- proteaceous scrub-heaths, rich in endemics, on the sandy earths of an extensive, undulating, and lateritic sandplain
- extensive York gum and Jam woodlands occur on outwash plains associated with drainage.

3.2 LAND SYSTEMS AND SURFACE GEOLOGY

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

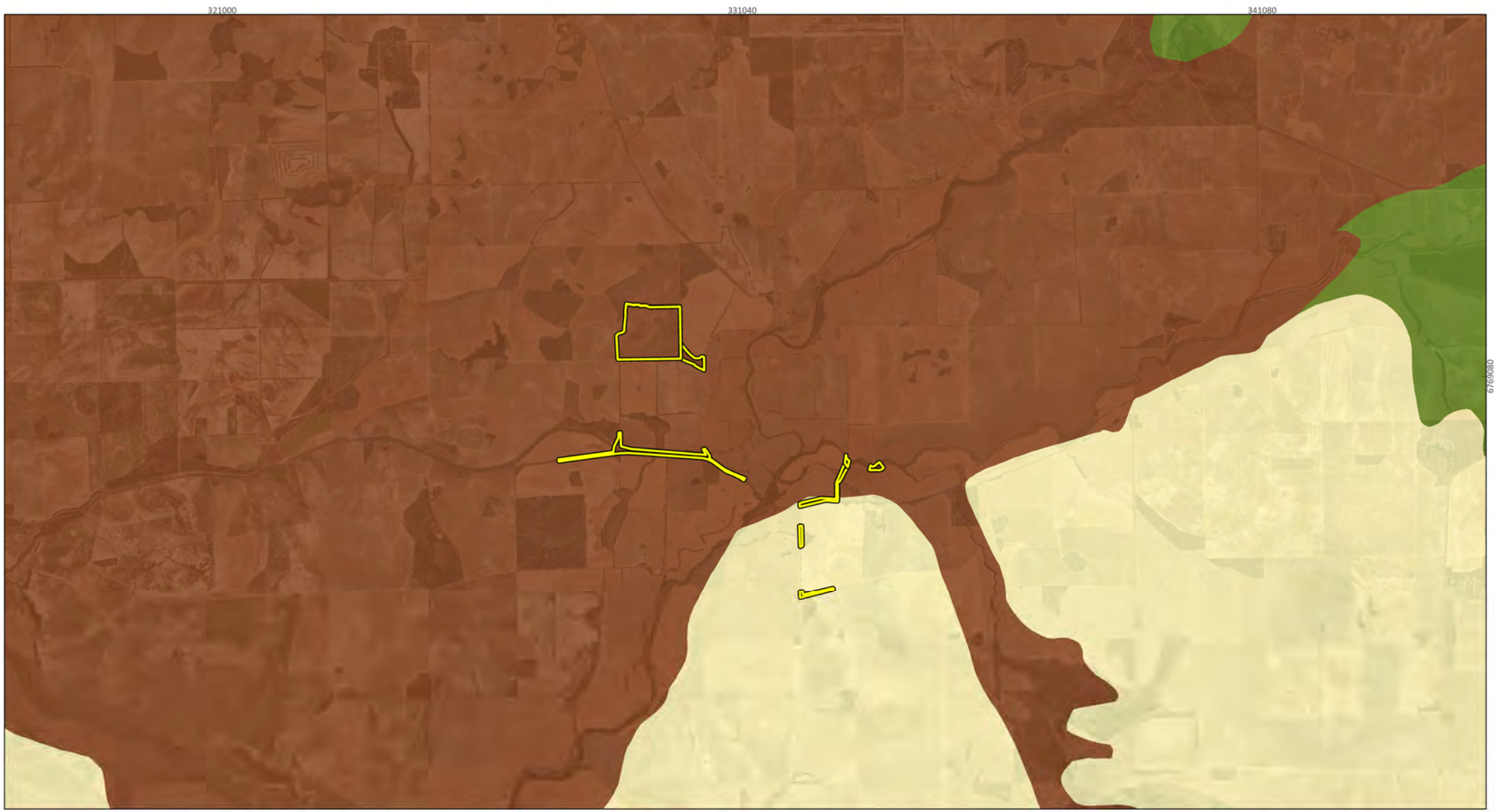
Table 3-1 Land systems and extent in study area

Land system	Description	Area (ha)	% of study area
Mount Horner System	Lateritic breakaways with spillway sands. Long gentle slopes broken by low gravel ridges and broad open depressions.	160.95	96.58
Irwin System	Level to very gently inclined alluvial flats and terraces of the Irwin and Lockier Rivers.	5.70	3.42
	Total	**166.65**	**100**

According to the Surface Geology of Australia 1:1,000,000 scale, Western Australia database (Stewart *et al.* 2008), the study area intersects 4 geological formations (Table 3-2; Figure 3-2). The dominant geological formation inside the study area is sand plain which makes up over 40% of the total area.

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

Surface geology	Abbreviation	Description	Area (ha)	% of study area
Sand Plain 38499	Czs	Sand or gravel plains; quartz sand sheets commonly with ferruginous pisoliths or pebbles, minor clay; local calcrete, laterite, silcrete, silt, clay, alluvium, colluvium, aeolian sand	70.63	42.38
Yarragadee Formation	Jsya	Variegated sandstone, feldspathic sandstone, siltstone, shale, conglomerate, coal	48.84	29.32
Colluvium 38491	Qrc	Colluvium, sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete, reworked laterite	40.10	24.06
Alluvium 38485	Qa	Channel and flood plain alluvium; gravel, sand, silt, clay, locally calcreted	7.07	4.24
		Total	**166.65**	**100**



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Lockyer Development

Project No	1601
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Drawn by	BK
Map author	KF

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Kilometers

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Study area

Region, subregion

- Avon Wheatbelt,Merredin
- Geraldton Sandplains,Geraldton Hills
- Geraldton Sandplains,Lesueur Sandplain

Figure 3-1

Study area in relation to IBRA bioregions and subregions

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Lockyer Development

Project No	1601
Date	25/10/2023
Drawn by	BK
Map author	KF

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Kilometers

1:40,500 (at A4) GDA 1994 MGA Zone 50

Study area

Surface geology

- Czs
- Jsya
- Qa
- Qrc

Land systems

- Irwin System
- Mount Horner System

Figure 3-2

Land systems in the study area

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3.3 CLIMATE AND WEATHER

The climate of the Leseur Sandplain (GS3) and Geraldton Hills (GS2) subregions of the Geraldton Sandplains bioregion is described as Mediterranean (Desmond & Chant 2001a, b). The nearest Bureau of Meteorology (BoM) weather station with comprehensive data collection and recent historic climate data is Morawa Airport (no. 008296), Latitude: 29.20°S Longitude 116.02°E), located 81.66 km east of the study area.

Morawa Airport records the highest mean maximum monthly temperature (37.5°C) in January (lowest in July, 18.8°C) and the lowest minimum mean monthly temperature (6.2°C) in July (highest in January, 20°C) (BoM 2022; Figure 3-3). Mean annual rainfall is 289.6 mm with June and July recording the highest monthly mean (39.8 and 45.5 mm respectively; Figure 3-3).

Daily mean temperatures at Morawa Airport preceding the surveys were 1.6°C lower and 2.3°C higher than historic daily minimums in May and June respectively, and 2.1°C lower and 0.7°C lower than historic daily maximums. During the month of the survey (August) the daily mean minimum temperatures were 1.4°C higher than historic maximum record, and daily mean maximum temperatures were 4.2°C higher than historical records respectively (Figure 3-3).

Records from Morawa Airport show total monthly rainfall for both the months of May and June to be respectively 22.9 mm and 11.2 mm lower than the historic mean rainfall. During the month of survey in August, the total monthly rainfall was 5.3 mm lower than the historic mean rainfall (Figure 3-3).

During the survey, the weather was consistent with long term averages for the season, and appropriate for the survey methods used. It rained on one of the days during the survey, which, coupled with the low temperatures the region experiences in August likely reduced the activity and therefore detectability of reptiles during the survey.

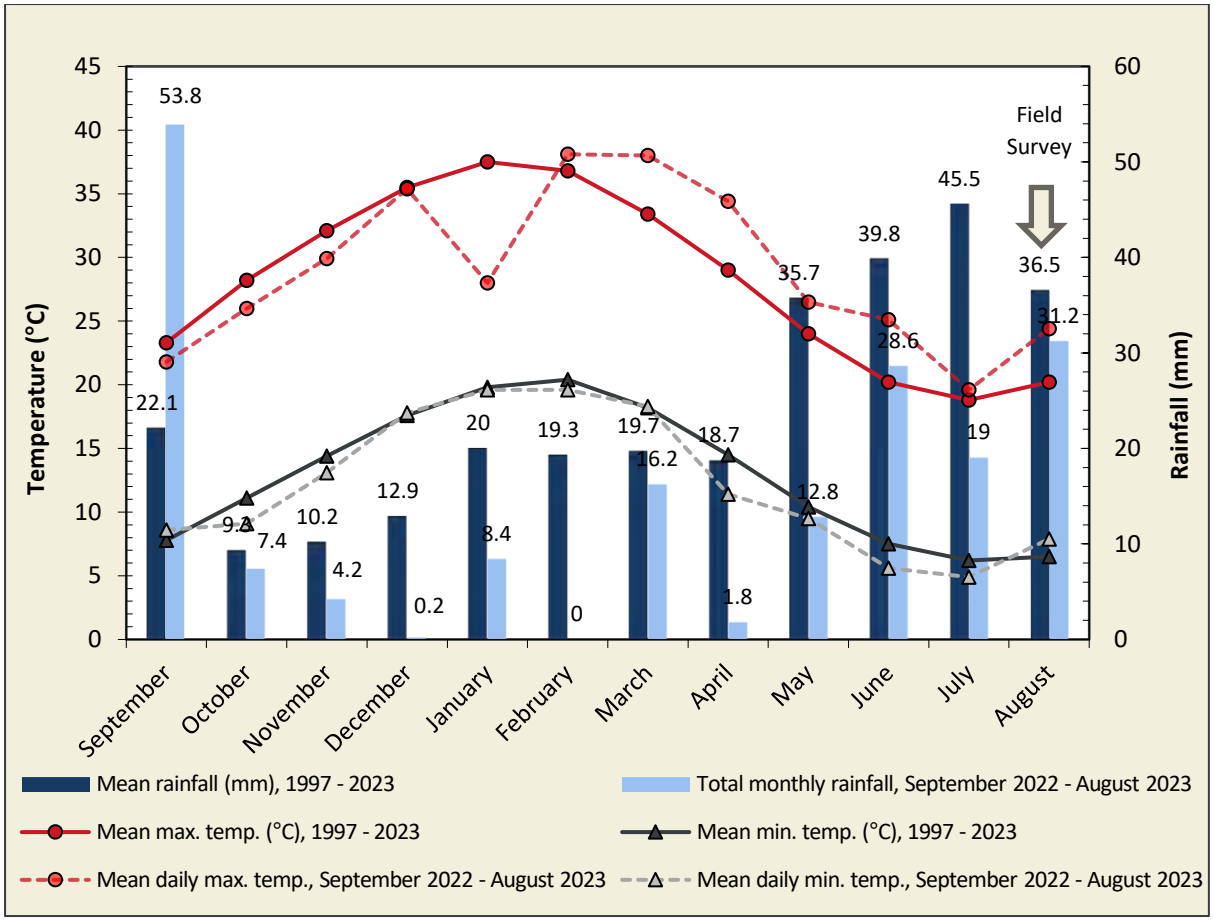


Figure 3-3 **Annual climate and weather data for Morawa Airport (no. 008296) and mean monthly data for the 12 months preceding the survey (BoM 2023)**

3.4 LAND USE

The dominant land use of the Geraldton Sandplains bioregion is dryland agriculture, with lesser areas of conservation, grazing, unallocated Crown Land and Crown reserves (Desmond & Chant 2001a; Desmond A. 2001a). The majority of the study area is used for production including dryland agriculture, plantations and cropping. Conservation and natural environments are the second most common land use (Table 3-3).

Table 3-3 **Land use of the study area, according to (ABARES 2018)**

Land use	Area (ha)	% of study area
Production from dryland agriculture and plantations	137.53	82.53
Conservation and natural environments	24.23	14.54
Intensive uses (transport and communications)	4.89	2.93
Total	**166.65**	**100**

3.5 CONSERVATION RESERVES AND ENVIRONMENTALLY SENSITIVE AREAS (ESAS)

The nearest conservation reserves are an unnamed reserve approximately 7 km northeast of the study area and Mingenew Reserve, located approximately 12 km east of the study area (Figure 1-1). Two small ESAs occur in the region; however, none intersect the study area (Figure 1-1).

4 METHODS

The targeted fauna survey was conducted in accordance with relevant survey guidelines and guidance, including:

- *EPA Statement of environmental principles, factors, objectives and aims of EIA* (EPA 2021)
- *EPA Environmental Factor Guideline: Terrestrial fauna* (EPA 2016a)
- *EPA Technical Guidance: Technical Guidance: Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020)
- *EPA Technical Guidance: Sampling of short-range endemic invertebrate fauna* (EPA 2016c)
- *DBCA National Malleefowl Monitoring Manual* (Natural Heritage Trust 2007)
- *Referral guideline for 3 WA Threatened black cockatoo species Carnaby's Cockatoo (Zanda latirostris), Baudin's Cockatoo (Zanda baudinii) and the Forest Red-tailed black cockatoo (Calyptorhynchus banksii naso)* (DAWE 2022)
- *DSWEPaC Survey guidelines for Australia's threatened birds* (DSEWPaC 2010).

4.1 DESKTOP REVIEW

Apart from recent updates to species conservation status and taxonomy (e.g. Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023; Western Australian Museum Department of Terrestrial Zoology (2023)) that will be adopted as applicable, results of the previous desktop reviews of regional context and previous fauna records remain valid and have not been duplicated for this survey.

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

Table 4-1 Database searches conducted for the desktop review

Database	Target group/s	Search coordinates and extent
Protected Matters Search Tool (DCCEEW 2023a)	EPBC Act Threatened flora, fauna and ecological communities	Approximate centre point of study area (-29.21831 °S, 115.26717 °E) with 40 km buffer
DBCA Threatened and Priority Fauna Database (DBCA 2023c)	Threatened and Priority fauna	Study area plus a 40 km buffer
DBCA NatureMap Database (DBCA 2023a)	Flora and fauna records	Study area plus a 40 km buffer
WA Museum Arachnid and Myriapod Database, Mollusca Database (WAM, 2023)	Arachnid, myriapod and mollusc SREs	100 x 100 km search area encompassing the study area between -28.85°S, 114.86°E (northwest corner) and 29.58°S, 115.67°E (southeast corner)

Table 4-2 Survey reports included in the desktop review

Report author	Survey description	Distance from study area	Project
Bamford (2021a)	Basic fauna survey and targeted black cockatoo habitat assessment	~32 km SW of study area	Arrowsmith North Silica Sand Project
eco logical Australia (2020)	Detailed and targeted flora and basic fauna survey with targeted black cockatoo and Malleefowl survey	~20 km S of study area	West Erregulla Pipeline
Preston (2021)	Supplementary report providing information to support the referral of the Arrowsmith North Silica Sand Project.	~32 km SW of study area	Arrowsmith North Silica Sand Project
Woodman Environmental (2018)	Detailed and targeted flora as well as a basic and targeted black cockatoo habitat assessment	~20 km SW of study area	Waitsia-03 Flowline Corridor
Woodman Environmental (2020)	Targeted flora and basic fauna assessment	~30 km E of study area	Cervantes Oil Prospect in the L14 Production Licence

4.2 FIELD SURVEY

4.2.1 Survey methods and timing

The field survey was completed between the 28th – 31st of August 2023. This is the winter season for the region, and within the interval (July – December) suitable for survey of Carnaby's Cockatoo habitat (DAWE 2022). The field methods for the fauna survey included:

- habitat assessment (see 4.2.3)
- camera trapping (4.2.4)
- black cockatoo habitat assessments (4.2.6)
- Malleefowl habitat assessment (4.2.9)
- SRE invertebrate sampling (4.2.10)

A total of 14 survey sites were sampled (Figure 4-2; Appendix A).

4.2.2 Survey personnel

The personnel involved in the surveys are listed in Table 4-3. All survey work was carried out under relevant licences issued by DBCA under the BC Act (Table 4-3).

Table 4-3 Survey personnel

Name	Permit	Qualifications	Role/s
Kerryn Fox	Fauna taking (biological assessment) licence no. BA27000910	B.Sc. (Conservation, Wildlife and Marine Biology); M.Sc. (Wildlife Health and Conservation)	Field survey, reporting
John Scanlon		B.Sc. Hons (Zoology); Ph.D. (Zoology)	Field survey, reporting

4.2.3 Habitat assessment

Initial habitat characterisation was undertaken using various remote geographical tools, including aerial photography (Google Earth®), land system maps and topographic maps. Habitats with the potential to support significant terrestrial fauna species were identified based on known habitats of such species within the Geraldton Sandplains bioregion. Tentative sites were selected for the terrestrial fauna survey to represent all habitat types. Final survey site selection was conducted after ground-truthing of site characteristics.

At the broadest scale, site selection considered aspect, topography and land systems. At the finer scale, consideration was given to proximity to water bodies (drainage lines and creeks), vegetation complexes and condition and soil type. Sites were primarily chosen to represent the best example of distinct habitats within the broader habitat associations of the study area with a focus on species of conservation significance identified in the desktop review. Habitat descriptions and characteristics were recorded at all survey sites (Figure 4-2; Table 4-4).

Permission was not obtained to access the eastern most portion of the study area (Figure 4-1), part of the Irwin River channel; black cockatoo habitat tree assessment could therefore not be applied there, but most fauna values are represented by other nearby sites and could therefore be extrapolated to include this area.

Table 4-4 Terrestrial fauna survey effort

Site	Site description	Traversed	Litter/Soil sieving	Foraging (hours)	Birding (hours)	Camera (hours deployed)	Malleefowl and black cockatoo habitat assessments
L001	✓	✓	✓	1	0.67		✓
L002	✓	✓	✓	1	0.67		✓
L003	✓	✓		1	0.67		✓
L003-SRE	✓	✓	✓	1			
L004	✓	✓		1	0.67		✓
L005	✓	✓		1	0.67		✓
L006	✓	✓	✓	1	0.67	43	✓
L007	✓	✓		1	0.67		✓
L008	✓	✓		1	0.67		✓
L009	✓	✓		1	0.67		✓
L010	✓	✓		1	0.67		✓
L012	✓	✓		1	0.67		✓
L013*	✓	✓		1	0.67		✓
L014	✓	✓		1	0.67		✓
Total (hours)				**13**	**8.14**	**43**	

* site located outside the study area

4.2.4 Camera trapping

A single motion sensitive cameras was deployed at L006 to target potentially significant species at the only site containing a water source. These devices are useful for detecting the presence of other noteworthy species present in the area such as introduced species (Cats and Foxes). The camera was baited with a non-consumable lure.

4.2.5 Targeted surveys for *Idiosoma arenaceum* trapdoor spider

Targeted searches were conducted for the characteristic burrows of the Priority listed species *Idiosoma arenaceum* (P3) within areas of most suitable habitat, as it has been previously recorded within the desktop search area. If detected, more intensive sampling could later be conducted within the refined development envelope. If burrows were identified, a representative specimens would have been taken for identification by the WA Museum. However, no characteristic burrows of *Idiosoma arenaceum* were detected during the survey.

4.2.6 Black Cockatoo habitat assessment

The study area is within the modelled distribution for Carnaby's Cockatoo, and close to the northern limits of known breeding and roosting sites (DBCA 2020). The survey took place within the breeding season (July to December), timing appropriate for survey of breeding habitat and foraging habitat in proximity (DAWE 2022). The black cockatoo habitat assessment therefore entailed recording of potential breeding habitat for Carnaby's Cockatoo and assessment of foraging habitat quality and night roosting habitat for Carnaby's Cockatoo.

4.2.7 Foraging habitat quality

Foraging quality was determined using both the DAWE Referral guideline for 3 WA threatened black cockatoo species (DAWE 2022), and the Bamford Consulting Ecologists (BCE) scoring system for the assessment of foraging value of vegetation for Black Cockatoos Rev. 4 (Bamford 2021b).

The tool provided in DAWE (2022) (Appendix g) takes into account:

- foraging potential (evidence of foraging)
- connectivity (extent of foraging within 12 km)
- proximity to breeding (within 12 km of breeding habitat)
- proximity to roosting (within 20 km of roosting habitat)
- impact from significant plant disease (e.g. Marri canker or Dieback of >50% of food plants).

The major limitation of the DAWE assessment tool is it does not adequately capture level of disturbance/degradation, resulting in misleading results. In contrast, the BCE system takes into account:

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

The BCE therefore places the greatest weight on side condition (0-6) as this has the highest influence on the foraging value of the site.

4.2.8 Breeding and roosting habitat

Breeding habitat for Carnaby's Cockatoo is defined by DAWE as known, suitable or potential nesting trees (DAWE 2022). These 3 types of trees are described as follows:

- Known nesting trees (KNT) - Trees that contain a hollow where black cockatoo breeding has been recorded, or which demonstrates evidence of breeding.

- Suitable nesting trees (SNT) - Trees with suitable nesting hollows present but have no evidence of use.
- Potential nesting trees (PNT) - Trees that have a suitable DBH to develop a nest hollow, but do not currently have hollows. Trees suitable to develop a nest hollow in the future are 300-500 mm DBH. Note that many species of eucalypt may develop suitable hollows for breeding.

Breeding habitat for Carnaby's Cockatoos can occur in woodland or forest habitats; however, they are also known to breed in areas of former woodland or forest habitats which consist of now fragmented patches of habitat and/or isolated trees.

Known breeding tree species in the Geraldton Sandplains bioregion include marri *Corymbia calophylla*, powderbark *E. accedens*, York gum *E. loxophleba* subsp. *loxophleba*, jarrah *E. marginata*, flooded gum *E. rudis* and tuart *E. gomphocephala*, however all black cockatoo species may breed in any suitable hollow and the species is not a defining characteristic (Tony Kirkby pers. comms. 27/04/2023).

Black cockatoo habitat assessment was limited to the study area boundary (except where access permission could not be obtained) and immediately adjacent public road corridors. The location of all potential breeding trees for Carnaby's Cockatoo was recorded on GPS accurate to <1 m under a dense canopy. Trees that met the required DBH measurement were inspected for hollows and assessed for suitability of nesting and/or roosting habitat. The number and size (aperture) of hollows at each tree was recorded.

Where hollows could be observed, they were considered 'suitable' where the hollow entrance was estimated to be >100 mm in diameter, >300 mm deep and aligned near-vertical (typically the main trunk). Where it was not possible to confirm that the hollow met the assessment criteria from the ground, the hollow was assessed as possibly suitable. Hollows were inspected from the ground with the use of binoculars. Hollows that clearly did not meet the criteria were identified as unsuitable hollows; however, the tree was still recorded as meeting the minimum DBH. Trees with hollows suitable for current breeding were inspected for evidence of use by the species such as wear and/or chew marks around hollow entrance.

4.2.9 Malleefowl habitat assessment

Malleefowl habitat was assessed in the field using a set of environmental variables based on features of critical Malleefowl habitat in Western and Central Australia, as described in the National Recovery Plan (Benshemesh 2007). Individual sites were assessed with a numerical score as a basis for mapping areas of suitable habitat in the study area. The score used is an unweighted sum of binary values (0 = absent, 1 = present) for the following attributes:

- sandy substrate (sand/sandy loam/sandy clay)
- litter (leaf litter forming distinct patches under trees/shrubs or - rarely in this area - continuous blanket over soil)
- canopy (tall shrubs or trees forming more or less continuous canopy, contributing to suitable ground microclimates and screen from aerial predators)
- level (ground approximately level, tending to prevent disturbance of soil and litter by rainfall runoff)
- mallee (presence of any mallee-form *Eucalyptus* sp.)
- *Melaleuca* (presence of any *Melaleuca* sp.)
- mulga s.l. (presence of any *Acacia* sp. of subgenus *Juliflorae*)
- *Triodia* (presence of any *Triodia* sp.).

Scores of 4 or greater (meaning a site contained at least 50% of features that comprise critical Malleefowl habitat) were considered to represent potential Malleefowl habitat. Sites that attained a

value of 4 or greater were applied to vegetation type polygons and the entire polygon (usually) assigned as potential Malleefowl habitat. Where 2 or more sites were assessed within a single polygon, the higher score was applied unless features of the lower-scored site(s) were more representative. Where no site occurred within a polygon, polygons were classified based on scores for similar vegetation nearby and inspection of relative vegetation density.

4.2.10 SRE invertebrate sampling

Sampling for SRE invertebrates was conducted at 14 sites (Table 4-4; Figure 4-2), in areas identified as suitable habitat for SREs. Sampling comprised the following methods:

- active foraging
- litter/soil sieving.

A standardised approach was undertaken whereby each site was sampled for one person hour (concurrently with active searches for vertebrate fauna), a total search effort of approximately 12 hours (Table 4-4).

Combined litter/soil sifts were undertaken at 4 sites with up to 3 sifts conducted at each site dependent on abundance of leaf litter. In total, 6 sifts were undertaken (Table 4-4). The collection of leaf litter samples was standardised volumetrically by the diameter and height (310 mm x 50 mm = 1.55 L) of the sieves which were completely filled with compressed litter and the upper layers of underlying soil. Samples were sieved through 3 stages of decreasing mesh size over a round tray and invertebrates were picked from the sieves and tray with forceps. These samples particularly targeted small spiders (Araneomorphae), pseudoscorpions, buthid scorpions, millipedes, centipedes (Geophilomorpha and Cryptopidae), and slaters.

4.2.11 SRE potential habitat rating

Fauna habitat mapping was assessed for its potential to support endemic SRE species and communities. Potential SRE habitat was rated as follows:

- High – defined/known areas of habitat that contain elements that often give rise to specialisation or dependency in invertebrate fauna, such as aspect (e.g. south-facing slopes, geological features (e.g. granite), soil types that retain water (e.g. clay, loam). These habitats may also include habitat isolates which have the capacity to restrict dispersal.
- Low – areas of largely in-tact native vegetation that occur broadly across the landscape, are less incised and typically link more restricted habitats. This may include land that was cleared but has since been rehabilitated or is in the process of being rehabilitated.
- None – land that has been previously cleared for other uses that no longer contains native vegetation.

4.2.12 SRE status rating

Currently, there is no accepted system to determine the likelihood that a species is an SRE. The WA Museum applies 3 categories: Confirmed, Potential, and Widespread. Confirmed SREs are taxa for which the distribution is known to be less than 10,000 km^2, the taxonomy is well known, and the group is well represented in collections and/or via comprehensive sampling (WAM 2013). Potential SREs include those taxa for which there is incomplete knowledge of taxonomy or geographic distribution, and the group is not well represented in collections. Phoenix applies 4 categories based on the WA Museum criteria (Table 4-5).

Table 4-5 Short-range endemic categories

SRE category	Criteria
Confirmed	Distribution < 10,000 km^2. Taxonomy of the group is well known (but not necessarily published); group is well represented in collections, in particular from the region in question; high levels of endemism exist in documented species; inference is often possible from immature specimens.
Likely	Taxonomy cannot be resolved to species level; closely related species are known SREs.
Potential	Distribution < 10,000 km^2. Taxonomically poorly resolved group; patchy distribution, often common in certain microhabitats, but no other regional records; congeners (= species in the same genus) both widespread and restricted in distribution.
Widespread	Distribution >10,000 km^2.
Uncertain	Taxonomy cannot be resolved to species level (i.e. indeterminate species designations due to sex, life stage or damage) and is therefore species distribution remains uncertain).

4.2.13 SRE taxonomy

Initial higher-level (class, order, family) identifications of specimens are undertaken by Phoenix staff in Phoenix' laboratory. Final species designations are allocated using specialist morphological and/or molecular sequencing (Table 4-6).

Where possible identifications are compared with reference material from the WA Museum and/or taxonomist reference collections.

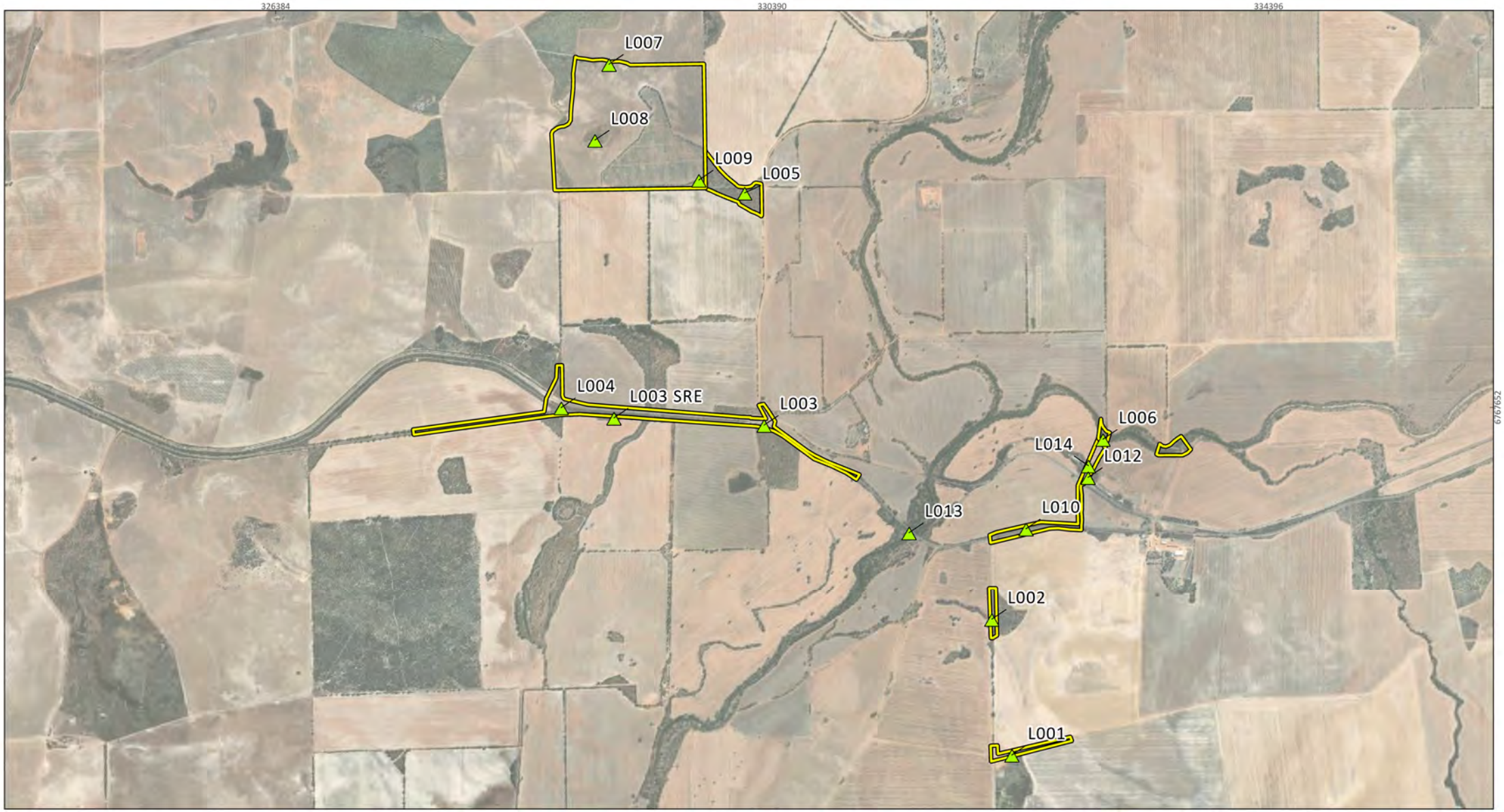
Table 4-6 Specialist taxonomists

Person	Title	Taxa
Dr Julianne Waldock	Technical Officer, Arachnology and Myriapodology WAM	Diplopoda (Millipedes)
Karen Cullen	Senior Molecular Biologist WAM	Diplopoda (Millipedes)
Anna Jacks	Invertebrate zoologist, Phoenix	Selenopidae spiders, Chilopoda, Gastropoda, Isopoda, Diplopoda

4.2.14 Likelihood of occurrence assessment

Following the field survey, the likelihood of occurrence for each significant fauna species identified in the desktop review was assessed and assigned to one of 4 ratings:

- recorded – species recorded within the study area by previous or current survey
- likely – study area within current known range of species, suitable habitat within the study area and home range of species intersects study area based on known records
- possible – study area within current known range of species, suitable habitat within the study area and home range of species does not intersect study area based on known records
- unlikely – study area outside current known range of species or no suitable habitat present in study area.



Strategen-JBS&G
Lockyer Development

Project No	1601
Date	3/11/2023
Drawn by	BK
Map author	KF

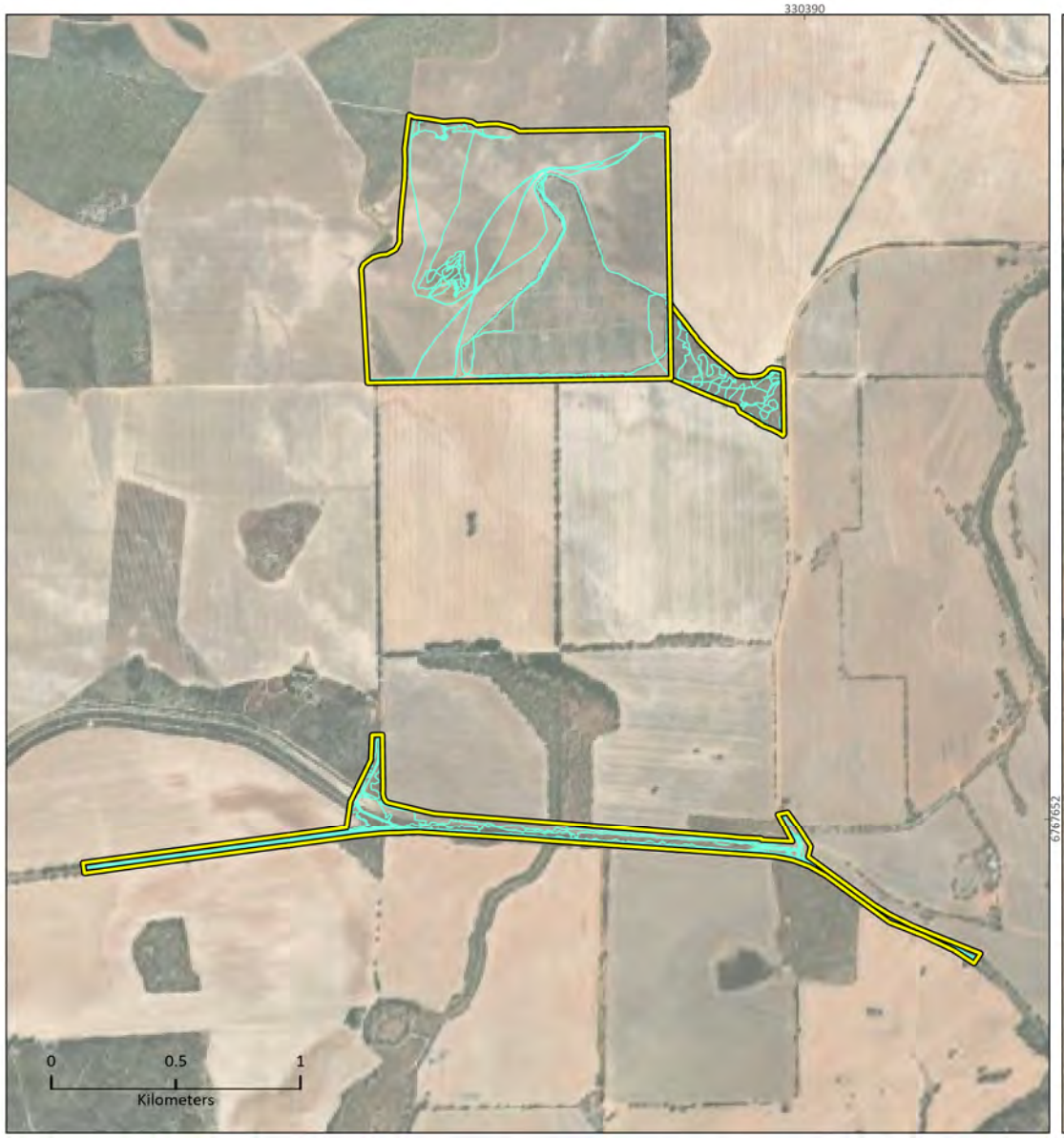
0 1 2
Kilometers

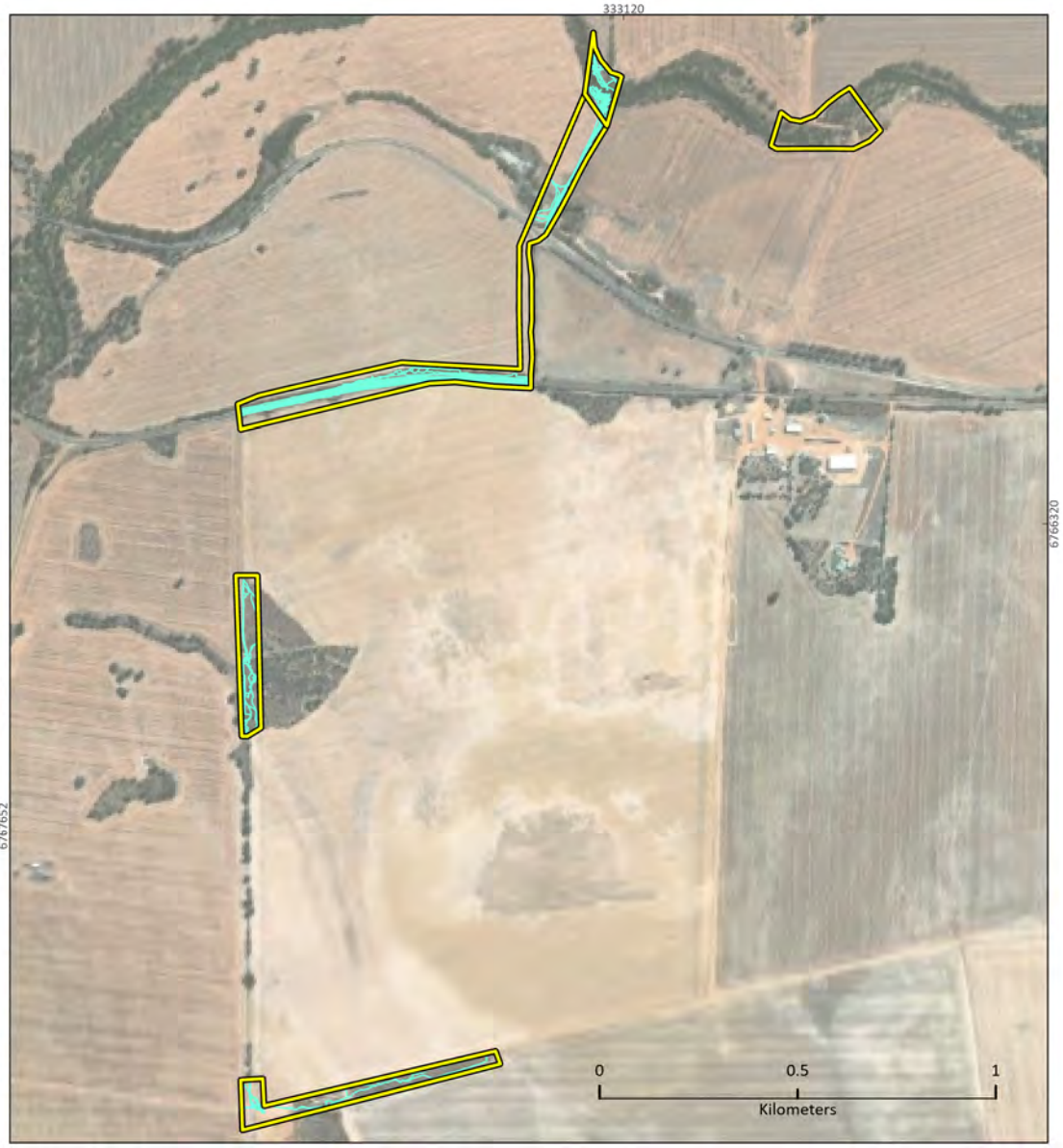
1:41,600 (at A4) GDA 1994 MGA Zone 50

Study area
Sites

Figure 4-1
Terrestrial fauna survey sites

PHOENIX ENVIRONMENTAL SCIENCES





Strategen-JBS&G
Lockyer Development

Project No	1601
Date	28/11/2023
Drawn by	BK
Map author	KF

GDA 1994 MGA Zone 50

Study area
Tracks

Figure 4-2

Tracks traversed during the survey

PHOENIX
ENVIRONMENTAL SCIENCES

5 RESULTS

5.1 DESKTOP REVIEW

5.1.1 Vertebrate fauna

The desktop review identified records of 295 vertebrate taxa within the 40 km desktop search extent. The list comprised 13 amphibians, 57 reptiles, 198 birds and 27 mammals (Table 5-1; Appendix c).

Thirty-six significant vertebrate species were identified in the desktop review, comprising 15 species listed as Threatened, Conservation Dependent or Specially Protected under the EPBC Act and/or BC Act (Table 5-1). Twenty-one avifauna species are listed as Migratory under the EPBC Act and BC Act (Table 5-3). A further 4 species are listed as Priority by DBCA (Table 5-3). No significant vertebrate species have previously been recorded within the study area (Figure 5-1).

Table 5-1 Summary of terrestrial vertebrate fauna desktop results

Class	Native	Introduced	Total
Amphibians	13	0	13
Reptiles	57	0	57
Birds	194	4	198
Mammals	17	10	27
Total	**281**	**14**	**295**

The results of the reports included in the literature review are summarised in Table 5-2.

Table 5-2 Summary of literature review results

Report	Habitats	Fauna results
Basic fauna survey and targeted black cockatoo habitat assessment for the Arrowsmith North Silica Sand Project (Bamford 2021a)	• Kwongan heath. • Dense riparian thickets. • Open, low Banksia woodland. • Low *Eucalyptus erythrocorys woodland.* • Open *Eucalyptus drummondii* mallee woodland.	• No evidence of Malleefowl recorded. Vegetation considered too low to be suitable for Malleefowl. • Foraging habitat for Carnaby's Black Cockatoo within the study area, however breeding and roosting unlikely. • Fork-tailed Swift and Peregrine Falcon possible irregular visitors.
Detailed and targeted flora and basic fauna survey with targeted black cockatoo and Malleefowl survey for the West Erregulla Pipeline (eco logical Australia 2020)	• *Allocasuarina campestris* tall sparse shrubland. • *Banksia* spp. and occasional *Eucalyptus todtiana* mid open woodland.	• No evidence of Malleefowl or Carnaby's Black Cockatoo recorded. • Study area considered negligible to low foraging value for black cockatoos. • Habitats not suitable for Malleefowl due to lack of leaf litter and sparse vegetation.
Supplementary report providing information to support the referral of the	• Kwongan heath. • Riparian thickets. • Open woodland.	• Study area unlikely to support black cockatoo roosting or breeding.

Report	Habitats	Fauna results
Arrowsmith North Silica Sand Project (Preston 2021)	• Low woodland. • Open mallee.	• Carnaby's Black cockatoo foraging evidence recorded, with kwongan heath being of highest foraging value. • No Malleefowl mounds or evidence of Malleefowl presence recorded, however this species is likely to be an irregular visitor. Suitable Malleefowl habitat is widespread throughout the area.
Detailed and targeted flora as well as a basic and targeted black cockatoo habitat assessment for the Waitsia-03 Flowline Corridor (Woodman Environmental 2018)	• Mixed tall shrubland with emergent *Banksia* and *Allocasuarina* spp. • *Allocasuarina* forest with scattered Eucalypts.	• Carnaby's Black Cockatoo recorded in the study area. • No potential black cockatoo nesting trees were recorded.
Targeted flora and basic fauna assessment for the Cervantes Oil Prospect in the L14 Production Licence (Woodman Environmental 2020)	• Tall to mid open shrubland. • Tall, closed *Melaleuca* shrubland. • Tall closed shrubland to low sparse shrubland of *Melaleuca* and *Acacia.* • Mid open to closed Eucalypt mallee forest.	• No hollow-bearing trees recorded therefore black cockatoo breeding unlikely. • Low foraging value for Carnaby's Black Cockatoo due to lack of proteaceous plant species. • Malleefowl a potential irregular visitor.

Table 5-3 Significant vertebrate fauna identified in the desktop review

Species	Status	Proximity to study area and year of record	Habitat
Reptiles (2)			
Egernia stokesii subsp. *badia* Western Spiny-tailed Skink	EN/VU (EPBC Act; BC Act)	*	Occurs in semi-arid woodlands of the northern wheatbelt, sheltering in hollow logs and behind the bark of fallen trees in York Gum woodlands. It is also found in old buildings and under piles of timber, tiles or other building materials, and on granite boulder piles or outcrop with crevices (DCCEEW 2023b)
Neelaps calonotos Black-striped Snake	P3 (DBCA list)	22 km SW, 2007 (DBCA 2023b)	The Black-striped Snake is restricted to the sandy coastal strip of the Swan Coastal Plain between Mandurah and Lancelin, with some records existing inland at Gingin, Bullsbrook and Caversham (Storr *et al.* 2002). This species primarily occurs on dunes and sandplains vegetated with heaths and Banksia woodlands.
Birds (29)			
Actitis hypoleucos Common Sandpiper	Mig. (EPBC & BC Acts)	32 km W, 2005 (Birdlife Australia 2023)	Found across all Australian states, the Common Sandpiper never occurs in large flocks, mostly singly. In WA the species is mostly coastal with some inland records (Geering *et al.* 2007) They are found across a wide range of wetlands: small ponds, large inlets and mudflats, where they forage on the shore usually close to the vegetation.
Anous tenuirostris subsp. *melanops* Australian Lesser Noddy	VU/EN (EPBC Act; BC Act)	32 km W, 1924 (DBCA 2023b)	Endemic to Australia and nests on the Houtman Abrolhos islands and, possibly, Ashmore Reef. Threatened by loss of mangrove habitats and cyclones (DCCEEW 2023b). Diet consists of small, surface dwelling fish (Birdlife International 2018) . They forage within 500 km of their colony (Surman *et al.* 2017).
Apus pacificus Fork-tailed Swift	Mig. (EPBC & BC Acts)	35 km W, 2003 (Birdlife Australia 2023)	Regular non-breeding migrant. Typically present from October to April. Forages and roosts in flight so not limited by terrestrial habitat (DCCEEW 2023b); flocks most often

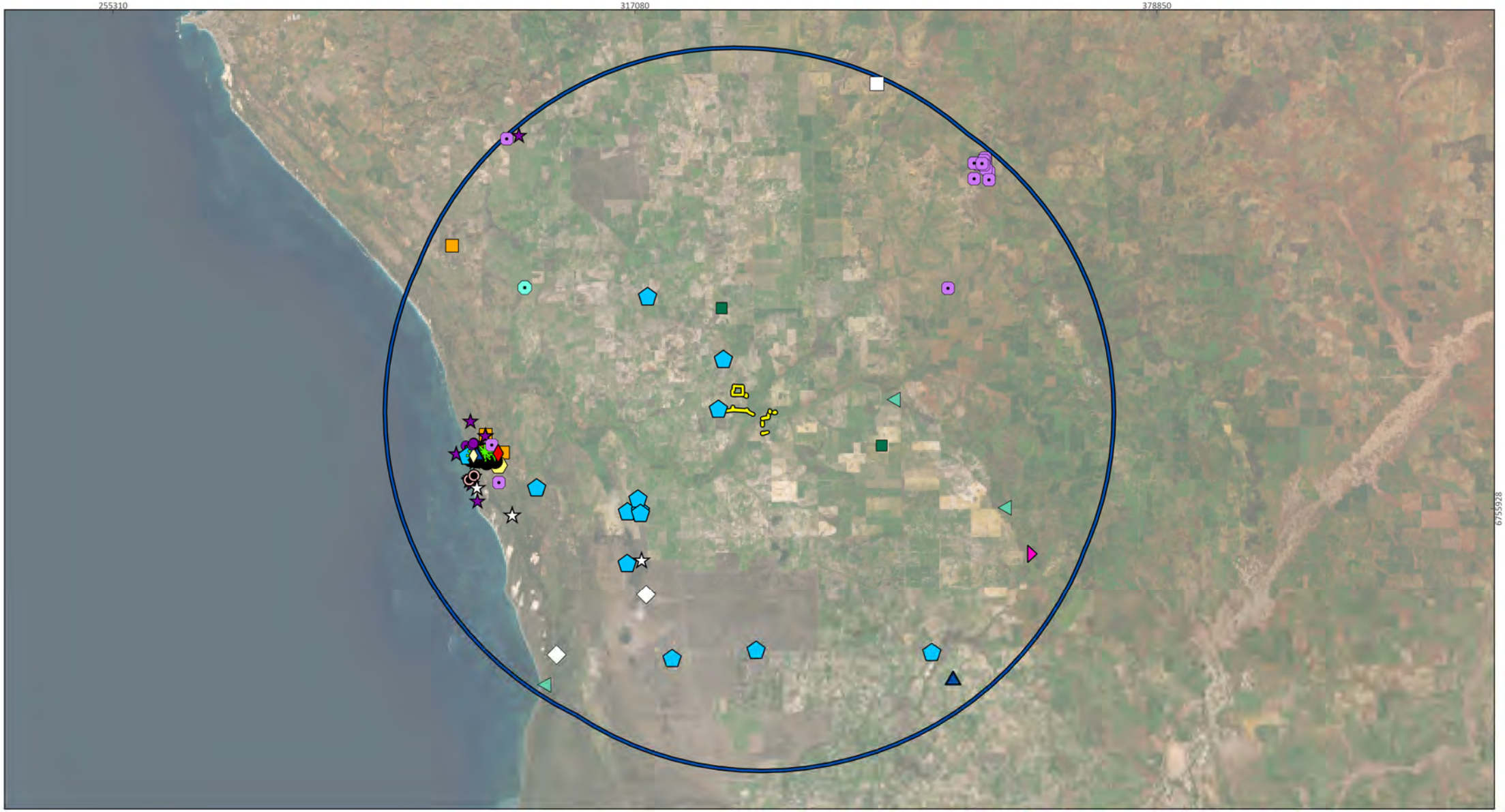
Species	Status	Proximity to study area and year of record	Habitat
			seen ahead of cyclones or during thunderstorms (Johnstone *et al.* 2013).
Arenaria interpres Ruddy Turnstone	Mig. (EPBC & BC Acts)	34 km W, 2005 (Birdlife Australia 2023)	In Australasia, the Ruddy Turnstone is mainly found on coastal regions with exposed rock coast lines or coral reefs. It also lives near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches (DCCEEW 2023b).
Calidris acuminata Sharp-tailed Sandpiper	Mig. (EPBC & BC Acts)	34 km W, 2001 (Birdlife Australia 2023)	Occurs on muddy edges of shallow fresh or brackish wetlands such as coastal lagoons, estuaries, bays, swamps, lakes, inland hypersaline salt lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands (DCCEEW 2023b) (Higgins & Davies 1996).
Calidris canutus Red Knot	EN/Mig./EN (EPBC Act; BC Act)	*	Mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps (Higgins & Davies 1996).
Calidris ferruginea Curlew Sandpiper	CR/Mig./CR (EPBC Act; BC Act)	*	Mainly occur on intertidal mudflats in sheltered coastal areas, also around non-tidal swamps, lakes, and lagoons near the coast. Less often inland around ephemeral and permanent lakes and waterholes, usually with bare edges of mud or sand (Higgins & Davies 1996).
Calidris melanotos Pectoral Sandpiper	Mig. (EPBC & BC Acts)	*	Wetlands, inland as well as on the coast. Occurs on shallow fresh to saline wetlands, usually coastal or near-coastal but occasionally further inland. Prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation (DCCEEW 2023b).

Species	Status	Proximity to study area and year of record	Habitat
Calidris ruficollis Red-necked Stint	Mig. (EPBC & BC Acts)	34 km W, 2000 (Birdlife Australia 2023)	Mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores (DCCEEW 2023b).
Zanda latirostris Carnaby's Black Cockatoo	EN (EPBC & BC Acts)	0.5 km N, 2000 (Birdlife Australia 2023)	Occurs in uncleared or remnant native eucalypt woodlands, and in shrublands or kwongan heathlands dominated by hakea, dryandra, banksia and grevillea species (DAWE 2022; DCCEEW 2023b)
Falco hypoleucos Grey Falcon	VU (EPBC & BC Acts)	*	The Grey Falcon is a widespread but rare species inhabiting much of the hot, semi-arid and arid interior of Australia. Occurs in a wide variety of arid habitats including open woodlands and open *Acacia* shrubland, hummock and tussock grasslands and low shrublands, particularly where crossed by tree-lined water courses (Schoenjahn *et al.* 2019; Threatened Species Scientific Committee 2020).
Falco peregrinus Peregrine Falcon	OS (BC Act)	28 km NE, 1999 (Birdlife Australia 2023)	Preferred habitat includes cliffs and wooded watercourses. Nesting occurs mainly on cliff ledges, granite outcrops, quarries and in trees with old raven or Wedge-tailed Eagle nests (Johnstone & Storr 1998)
Hydroprogne caspia Caspian Tern	Mig. (EPBC & BC Acts)	32 km W, 2007 (Birdlife Australia 2023)	Found in sheltered coastal habitats and near-coastal terrestrial wetlands (DCCEEW 2023b).
Leipoa ocellata Malleefowl	VU (EPBC & BC Acts)	16 km E, 1988 (DBCA 2023b)	Malleefowl occur mainly in scrubs and thickets of mallee (*Eucalyptus* spp.), boree (*Melaleuca lanceolata*) and bowgada (*Acacia linophylla*), and other dense litter-forming shrublands including Mulga Shrublands (Johnstone & Storr 2004). Nest mounds require sandy soil as well as abundant litter (Benshemesh 2007).
Limosa lapponica subsp. *menzbieri* Bar-tailed Godwit (northern Siberian)	CR/Mig./VU/Mig. (EPBC Act; BC Act)	*	Found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays (DCCEEW 2023b).

Species	Status	Proximity to study area and year of record	Habitat
Motacilla cinerea Grey Wagtail	Mig. (EPBC & BC Acts)	*	Vagrant visitor to Australia that inhabits fast flowing streams and rivers (IUCN 2019).
Numenius madagascariensis Eastern Curlew	CR/Mig./CR (EPBC Act; BC Act)	*	Occurs mainly on intertidal mudflats, on exposed seagrass beds or mudflats (Geering *et al.* 2007). Also utilises sand spits of estuaries, mangroves, lake shores and ocean beaches.
Oxyura australis Blue-billed Duck	P4 (DBCA list)	9 km N, 2007 (Adrian Pinder / DBCA internal data)	Endemic to Australia's temperate regions, inhabiting terrestrial wetlands (fresh or saline) with extensive bordering vegetation, including artificial wetland, such as sewage ponds (Birdlife International 2015; del Hoyo *et al.* 2014).
Pandion cristatus Osprey	Mig. (EPBC & BC Acts)	32 km W, 2012 (Birdlife Australia 2023)	Occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. Occur in a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes (DCCEEW 2023b).
Plegadis falcinellus Glossy Ibis	Mig. (EPBC & BC Acts)	40 km NE, 2007 (Adrian Pinder / DBCA internal data)	Predominantly inhabits terrestrial wetlands, foraging in shallow water over soft substrate or on grassy or muddy verges of wetlands providing a variety of water depths. Inland, freshwater wetlands are preferred, especially permanent or ephemeral waterbodies on floodplains and shallow swamps with abundant aquatic flora (Johnstone *et al.* 2013; Marchant & Higgins 1990).
Pluvialis fulva Pacific Golden Plover	Mig. (EPBC & BC Acts)	*	In Australia this species usually inhabits coastal habitats, on beaches, mudflats and sandflats (DCCEEW 2023b).
Rostratula australis Australian Painted Snipe	EN (EPBC & BC Acts)	*	Generally, inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps

Species	Status	Proximity to study area and year of record	Habitat
			of lignum *Muehlenbeckia* or canegrass or sometimes tea-tree (*Melaleuca*) (DCCEEW 2023b).
Sterna albifrons White-shafted Little Tern	Mig. (BC Act)	*	In Australia, they inhabit sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets (DCCEEW 2023b).
Sternula nereis subsp. *nereis* Fairy Tern	VU (EPBC & BC Acts)	*	In WA, the species is present along the entire coastline, with rare records from the far north (Kimberley) and off the Nullarbor Plain (Spineless Wonders 2015). It nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation.
Thalasseus bergii Crested Tern	Mig. (BC Act)	32 km W, 2012 (Birdlife Australia 2023)	Inhabits tropical and subtropical coastlines. Found along the entire Australian coast (IUCN 2019).
Tringa brevipes Grey-tailed Tattler	Mig. (EPBC and BC Acts); P4 (DBCA list)	30 km NW, 2002 (Birdlife Australia 2023)	Occurs on sheltered coasts with reefs and rock platforms or mudflats, and can also be found on reefs or platforms that are exposed at low tide (DCCEEW 2023b).
Tringa nebularia Common Greenshank	Mig. (EPBC & BC Acts)	32 km W, 2004 (Birdlife Australia 2023)	Mostly on the coast but sometimes inland; uses permanent and ephemeral terrestrial wetlands, including rivers and creeks (DCCEEW 2023b).
Tringa stagnatilis Marsh Sandpiper	Mig. (EPBC & BC Acts)	32 km W, 2005 (Birdlife Australia 2023)	Inhabits coastal and inland wetlands, estuarine and mangrove mudflats, beaches, swamps, lakes and several other types of wetlands (Morcombe 2004).
Xenus cinereus Terek Sandpiper	Mig. (EPBC & BC Acts)	*	Inhabits coastal mudflats, sheltered estuaries and lagoons. In Australia, it has a primarily coastal distribution, with occasional records inland (Morcombe 2004).
Mammals (5)			
Dasyurus geoffroii Chuditch	VU (EPBC & BC Acts)	31 km W, 2012 (DBCA 2023b)	Formerly widespread in very diverse habitats, now mostly in Jarrah forest and woodland of the southwest, also heath and mallee habitats along the south coast; uses horizontal hollow logs or earth burrows as refugia and dens (DEC 2012b).

Species	Status	Proximity to study area and year of record	Habitat
Hydromys chrysogaster Water-rat	P4 (DBCA list)	*	The Water-rat occupies habitats in the vicinity of permanent water, favouring areas with dense, low-lying vegetation, low density canopy cover, good water quality, narrow water bodies and some habitat complexity (DEC 2012c; Speldewinde *et al.* 2013). It is likely that woody debris, rock ledges and wetland islands are important for refuge and feeding (DEC 2012c). Can also occur in mangrove and estuarine areas (IUCN 2019).
Notamacropus irma Western Brush Wallaby	P4 (DBCA list)	23 km SW, 2002 (DBCA 2023b)	Grazing species, occurs in open forest or woodland with low grasses and scrubby thickets, and also found in some areas of mallee and heathland (DEC 2012d).
Parantechinus apicalis Dibbler	EN (EPBC & BC Acts)	*	Have been recorded over an extensive area and it is likely that they can occupy a diverse range of habitats. Dibblers seem to prefer vegetation with a dense canopy greater than 1 m high which has been unburnt for at least 10 years or more (DCCEEW 2023b).
Phascogale tapoatafa subsp. *wambenger* South-western Brush-tailed Phascogale	CD (BC Act)	39 km SE, 2000 (DBCA 2023b)	This subspecies has been observed in dry sclerophyll forests and open woodlands that contain hollow-bearing trees. These nocturnal, arboreal carnivores forage for food under the bark of trees (DEC 2012a).



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Map author	KF

0 15 30
Kilometers

1:610,600 (at A4) GDA 1994 MGA Zone 50

- Study area
- 40km buffer

Species, status

- Australian Lesser Noddy, VU/EN (EPBC Act; BC Act)
- Australian Peregrine Falcon, CD (BC Act)
- Black-striped Snake, P3 (DBCA list)
- Blue-billed Duck, P4 (DBCA list)
- Carnaby's Black Cockatoo, EN (EPBC & BC Acts)
- Caspian Tern, Mig. (EPBC & BC Acts)
- Chuditch, VU (EPBC & BC Acts)
- Common Greenshank, Mig. (EPBC & BC Acts)
- Common Sandpiper, Mig. (EPBC & BC Acts)
- Crested Tern, Mig. (BC Act)
- Fork-tailed Swift, Mig. (EPBC & BC Acts)
- Glossy Ibis, Mig. (EPBC & BC Acts)
- Grey-tailed Tattler, P4 (DBCA list)
- Malleefowl, VU (EPBC & BC Acts)
- Marsh Sandpiper, Mig. (EPBC & BC Acts)
- Osprey, Mig. (EPBC & BC Acts)
- Peregrine Falcon, OS (BC Act)
- Red-necked Stint, Mig. (EPBC & BC Acts)
- Ruddy Turnstone, Mig. (EPBC & BC Acts)
- Sharp-tailed Sandpiper, Mig. (EPBC & BC Acts)
- South-western Brush-tailed Phascogale, CD (BC Act)
- Western Brush Wallaby, P4 (DBCA list)

Figure 5-1

Desktop records of significant vertebrate fauna

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5.1.2 SRE invertebrate fauna

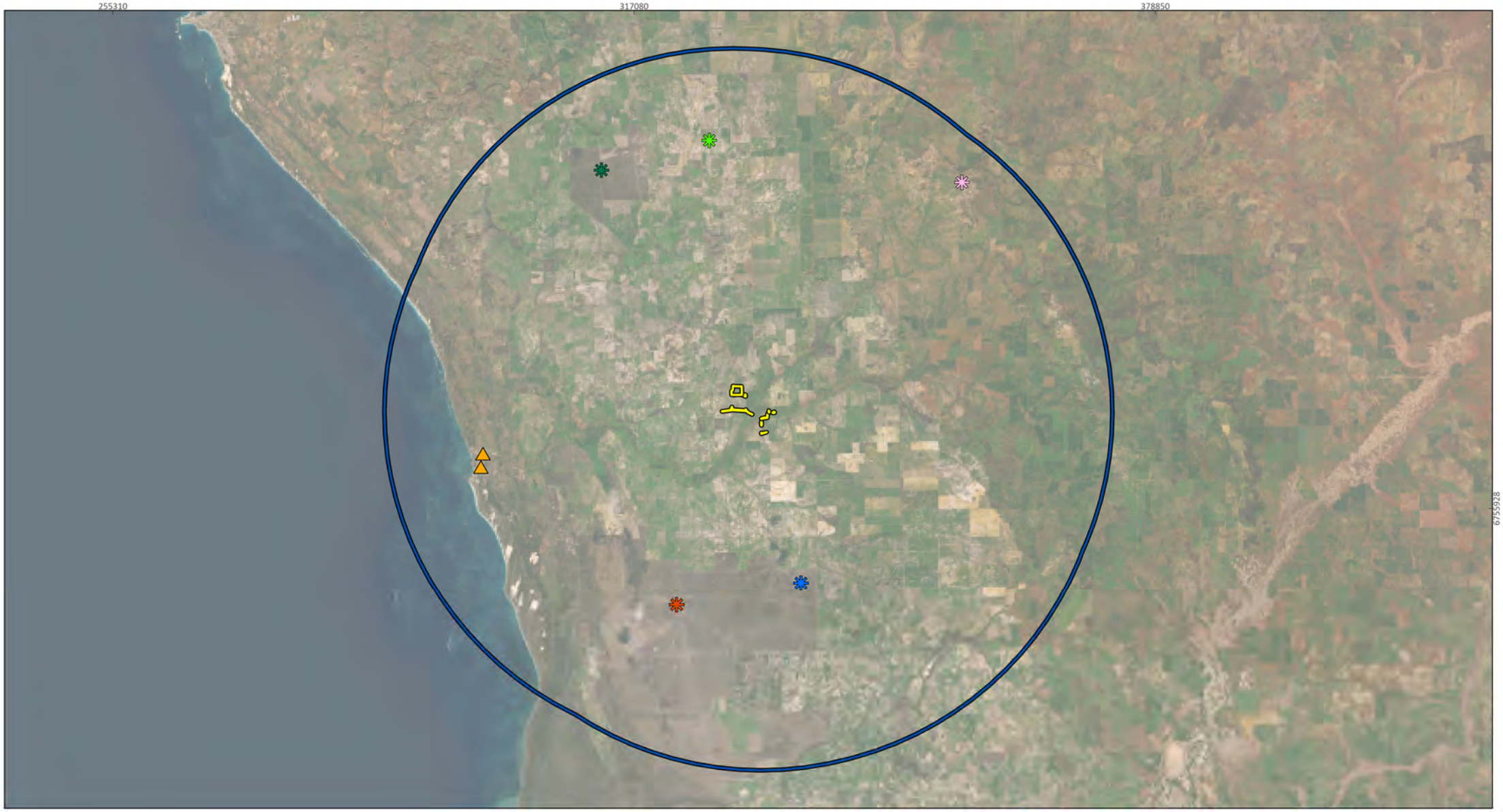
The desktop review identified records of 6 confirmed SRE taxa and 20 potential SRE taxa from within the SRE desktop search area (Table 5-4; Figure 5-2). A further 19 taxa of uncertain SRE status were identified.

The desktop records indicate no SRE species have previously been recorded within the study area (Figure 5-2). This could be due to lack of historic survey effort in the study area, and/or due to lack of suitable habitat. Of the 45 taxa confirmed, potential and or uncertain SRE taxa, 10 are named species, *Basedowena bethana, Bothriembryon perobesus, Bothriembryon whitleyi, Buddelundia callosa, Buddelundia lateralis, Buddelundia subinermis, Bungulla Banksia, Bungulla bringo, Idiosoma arenaceum* and *Idiosoma kwongan*. The remaining 35 comprise taxa named only to morphospecies codes as applied by the WA Museum or are not identified to confirmed species level (i.e. "sp." or "cf."). The majority of taxa records of uncertain SRE status are unidentifiable ("sp. indet.", i.e. female or juvenile specimens) or could not be identified to species or morphospecies and may represent new species or other species listed in the same genus where records exist (Table 5-4).

Table 5-4 SRE taxa identified in the desktop review

Higher taxon, Family	Species	SRE category	Proximity to study area and year of record (WAM 2023)	Habitat records
Class Arachnida, infraorder Mygalomorphae (trapdoor spiders)				
Anamidae	*Aname* `MYG633`	Potential	31.48 km, 2002	-
Anamidae	*Aname* `sp. indet.`	Uncertain	11.38 km, 2021	-
Anamidae	*Kwonkan* `sp. indet.`	Uncertain	28.34 km, 1998	-
Anamidae	*Proshermacha* `sp. indet.`	Uncertain	19.58 km, 2007	Kwongan heath
Anamidae	*Teyl* `sp. indet.`	Uncertain	19.58 km, 2007	-
Idiopidae	*Bungulla banksia*	Potential	28.43 km, 1986	-
Idiopidae	*Bungulla bringo*	Potential	34.58 km, 1953	-
Idiopidae	*Euoplos* `sp. indet.`	Uncertain	32.50 km, 2021	-
Idiopidae	*Idiosoma* `BMYG188`	Potential	28.43 km, 2021	-
Idiopidae	*Idiosoma* `BMYG189`	Potential	30.98 km, 2021	-
Idiopidae	*Idiosoma* `MYG759`	Potential	21.29 km, 1986	-
Idiopidae	*Idiosoma* `MYG761`	Potential	39.01 km, 1998	-
Idiopidae	*Idiosoma kwongan*	Potential (P1)	17.77 km, 2021	-
Idiopidae	*Idiosoma arenaceum*	Potential (P3)	34.42 km, 1954	-
Idiopidae	*Idiosoma* `sp. indet.`	Uncertain	29.28 km, 2021	-
Halonoproctidae	*Conothele* `sp. indet.`	Uncertain	27.19 km, 1954	-
Actinopodidae	*Missulena* `sp. indet.`	Uncertain	33.37 km, 1995	-
Theraphosidae	*Selenocosmia* `sp. indet.`	Uncertain	27.56 km, 1963	-
Class Arachnida, order Pseudoscorpiones				
Chthoniidae	*Austrochthonius* `PSE192, lesueuri`	Potential	24.89 km, 1992	Banksia litter
Cheliferidae	*Protochelifer* `sp. indet.`	Uncertain	32.95 km, 2007	-
Class Arachnida, order Scorpiones				
Urodacidae	*Urodacus* `armatus spp. group`	Potential	10.46 km, 2000	-

Higher taxon, Family	Species	SRE category	Proximity to study area and year of record (WAM 2023)	Habitat records
Urodacidae	*Urodacus* `BSCO071`	Potential	32.13 km, 2021	-
Urodacidae	*Urodacus* `SCO016, Mingenew`	Potential	12.91 km, 2003	Grey soil with litter and rubbish
Urodacidae	*Urodacus* `SCO019, Casuarinas`	Potential	28.09 km, 2000	-
Bothriuridae	*Cercophonius* `sp. indet.`	Uncertain	31.48 km, 2001	-
Buthidae	*Lychas* `sp. indet.`	Uncertain	31.48 km, 1931	-
Urodacidae	*Urodacus* `sp. indet.`	Uncertain	29.90 km, 1926	-
Class Crustacea, order Isopoda (isopods)				
Armadillidae	*Buddelundia* '88'	Potential	96.48 km, 2014	-
Armadillidae	*Buddelundia callosa*	Potential	90.73 km, 2009	-
Armadillidae	*Buddelundia lateralis*	Potential	10.39 km, N.D.	-
Armadillidae	*Buddelundia subinermis*	Potential	98.03 km, 2010	-
Armadillidae	*Buddelundia* sp. indet.	Uncertain	1.4 km, N.D.	-
Platyarthridae	*Trichorhina* sp. indet.	Uncertain	88.10 km, 2010	-
Class Diplopoda (millipedes)				
Paradoxosomatidae	*Antichiropus* `DIP072, casuarinae`	Confirmed	28.09 km, 1999	-
Paradoxosomatidae	*Antichiropus* `DIP076`	Confirmed	14.74 km, 2021	low heath on low lateritic breakaway
Paradoxosomatidae	*Antichiropus* `DIP078, Eneabba 1`	Confirmed	19.58 km, 2007	Kwongan heath
Paradoxosomatidae	*Antichiropus* `DIP099, mcmillani`	Confirmed	36.15 km, 1998	-
Paradoxosomatidae	*Antichiropus* `DIP136, mobilis`	Confirmed	28.53 km, 1986	-
Paradoxosomatidae	*Antichiropus* `sp. indet.`	Uncertain	25.94 km, 1998	-
Iulomorphidae	*Iulomorphidae* `sp. indet.`	Uncertain	14.74 km, 2021	low heath on low lateritic breakaway
Class Gastropoda (land snails)				
Bothriembryontidae	*Bothriembryon whitleyi*	Confirmed (EX)	31.87 km, 1974	-
Bothriembryontidae	*Bothriembryon perobesus*	Potential (P1)	30.74 km, 2021	-
Bothriembryontidae	*Bothriembryon* `sp. indet.`	Uncertain	6.59 km, 2010	Fossiliferous outcrop
Camaenidae	*Basedowena bethana*	Potential	43.54 km, 1974	
Camaenidae	*Basedowena* `sp. indet.`	Uncertain	44.93 km, 1962	From under stones & leaf litter



Strategen-JBS&G
Lockyer Development

Project No	1601
Date	28/11/2023
Drawn by	BK
Map author	KF

0 15 30
Kilometers

1:610,600 (at A4) GDA 1994 MGA Zone 50

Study area
40km buffer

Taxon, SRE status

- *Antichiropus* `DIP072, casuarinae`, Confirmed
- *Antichiropus* `DIP076`, Confirmed
- *Antichiropus* `DIP078, Eneabba 1`, Confirmed
- *Antichiropus* `DIP099, mcmillani`, Confirmed
- *Antichiropus* `DIP136, mobilis`, Confirmed
- *Bothriembryon whitleyi*, Confirmed, EX

Figure 5-2a

Desktop records of confirmed SRE invertebrate fauna

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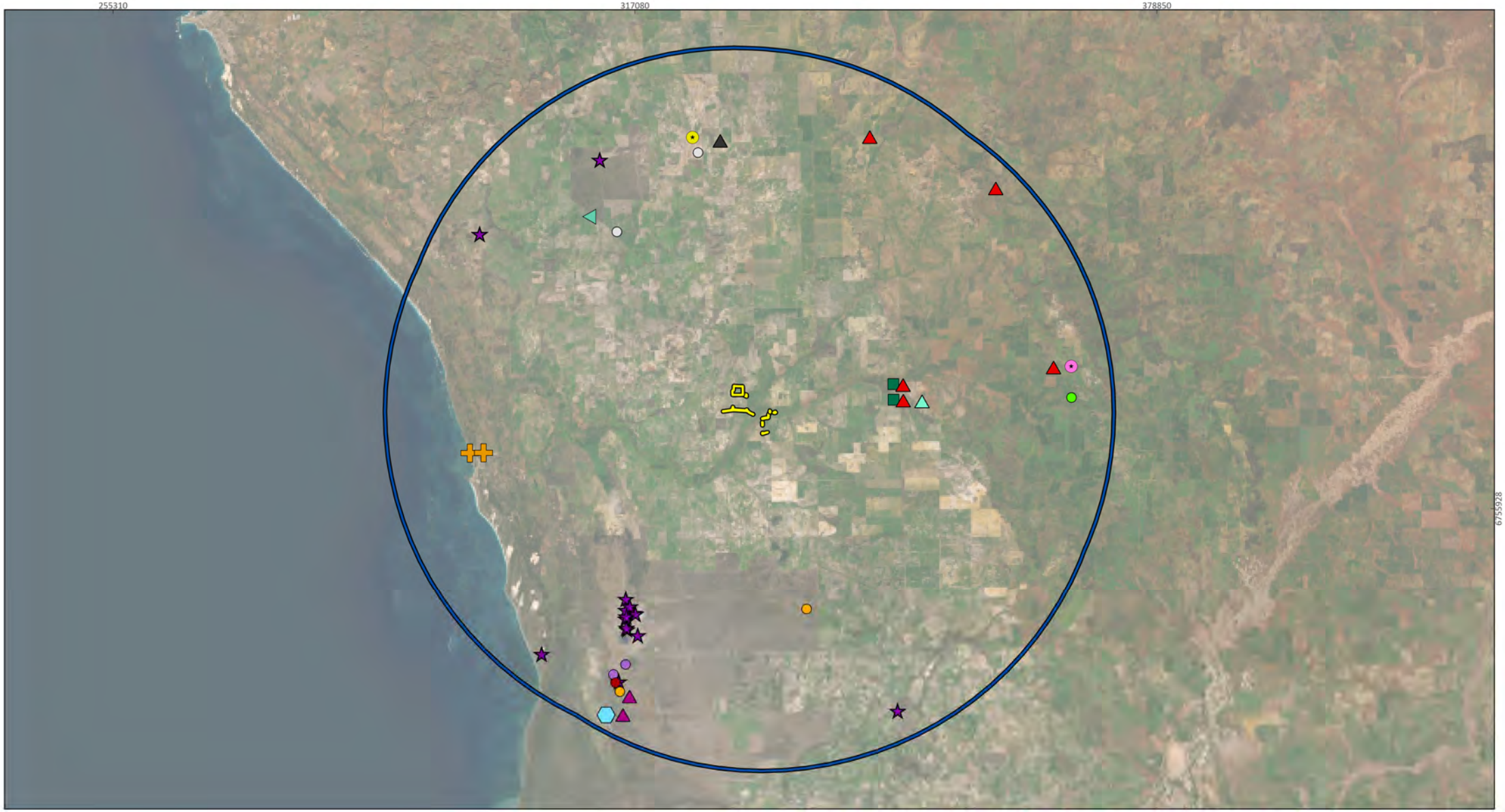

Strategen-JBS&G
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Project No	1601
Date	28/11/2023
Drawn by	BK
Map author	KF

0 15 30
Kilometers

1:610,600 (at A4) GDA 1994 MGA Zone 50

- Study area
- 40km buffer

Taxon, SRE status

- *Aname* `MYG633`, Potential
- *Austrochthonius* `PSE192, lesueuri`,Potential
- *Bothriembryon perobesus*, Potential, P1
- *Buddelundia lateralis*, Potential
- *Bungulla banksia*, Potential
- *Bungulla bringo*, Potential
- *Hexabathynella* `sp. indet.`, Potential
- *Idiosoma* `BMYG188`, Potential
- *Idiosoma* `BMYG189`, Potential
- *Idiosoma* `MYG759`, Potential
- *Idiosoma arenaceum*, Potential, P3
- *Idiosoma kwongan*, Potential, P1
- *Urodacus*`BSCO071`, Potential
- *Urodacus* `SCO016, Mingenew`, Potential
- *Urodacus* `SCO019, Casuarinas`, Potential
- *Urodacus* `armatus spp. group`, Potential

Figure 5-2b

Desktop records of potential SRE invertebrate fauna

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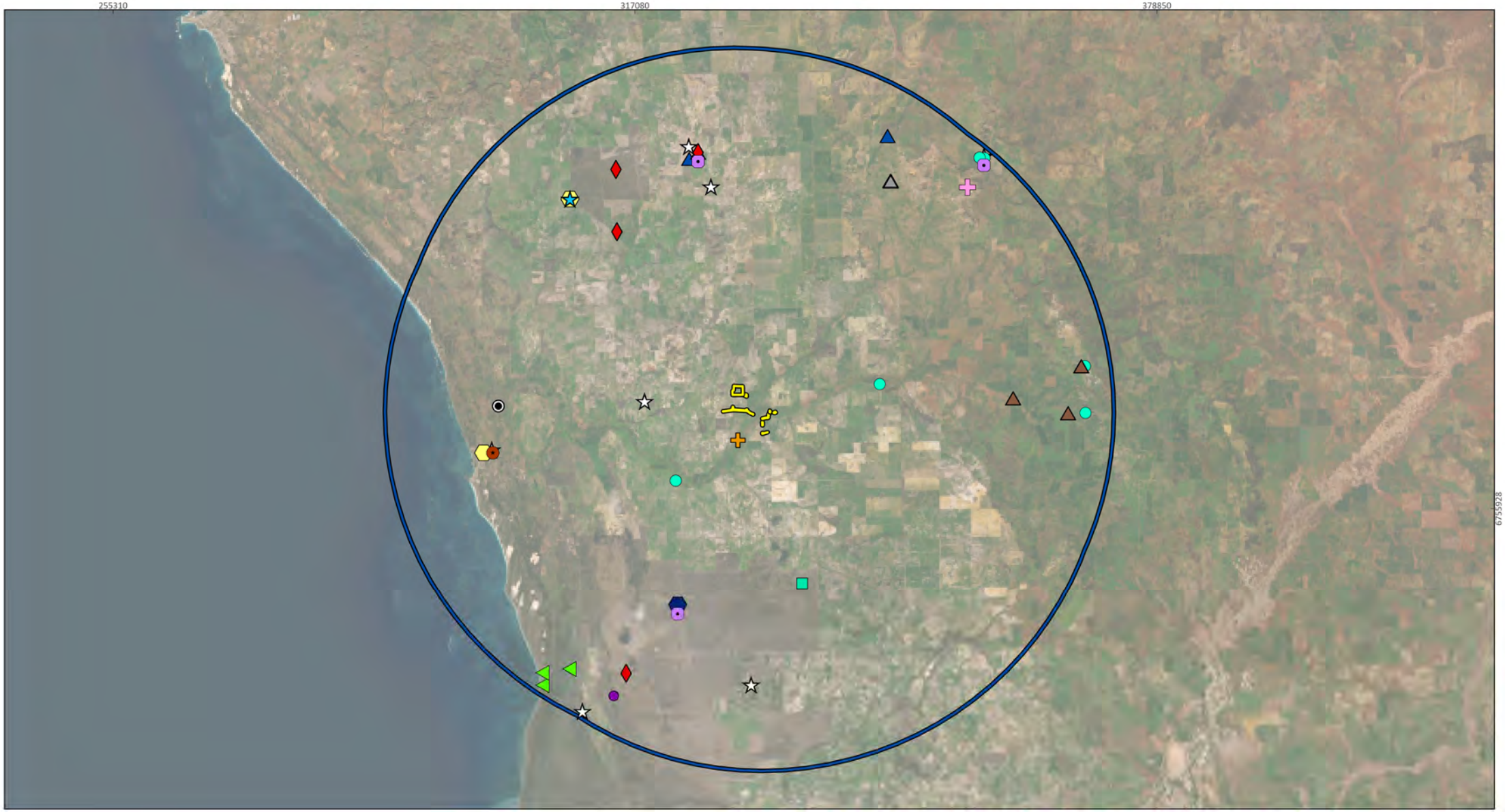

Strategen-JBS&G
Lockyer Development

Project No	1601
Date	28/11/2023
Drawn by	BK
Map author	KF

0 15 30
Kilometers

1:610,600 (at A4) GDA 1994 MGA Zone 50

- Study area
- 40km buffer

Taxon, SRE status

- ☆ *Aname* `sp. indet.`, Uncertain
- ▲ *Antichiropus* `sp. indet.`, Uncertain
- ● *Bothriembryon* `sp. indet.`, Uncertain
- ✚ *Buddelundia* `sp. indet.`, Uncertain
- ⬢ *Cercophonius* `sp. indet.`, Uncertain
- ▲ *Conothele*`sp. indet.`, Uncertain
- ● *Euoplos* `sp. indet.`, Uncertain
- ♦ *Idiosoma* `sp. indet.`, Uncertain
- ■ Iulomorphidae `sp. indet.`, Uncertain
- ★ *Kwonkan* `sp. indet.`, Uncertain
- ◉ *Lychas* `sp. indet.`, Uncertain
- ✚ *Missulena* `sp. indet.`, Uncertain
- ⬢ *Proshermacha*`sp. indet.`, Uncertain
- ◀ *Protochelifer*`sp. indet.`, Uncertain
- △ *Selenocosmia* `sp. indet.`, Uncertain
- ⬮ *Teyl* `sp. indet.`, Uncertain
- ◉ *Urodacus* `sp. indet.`, Uncertain

Figure 5-2c

Desktop records of uncertain SRE invertebrate fauna

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5.3 FIELD SURVEY

5.3.1 Vertebrate fauna

5.3.1.1 Habitats

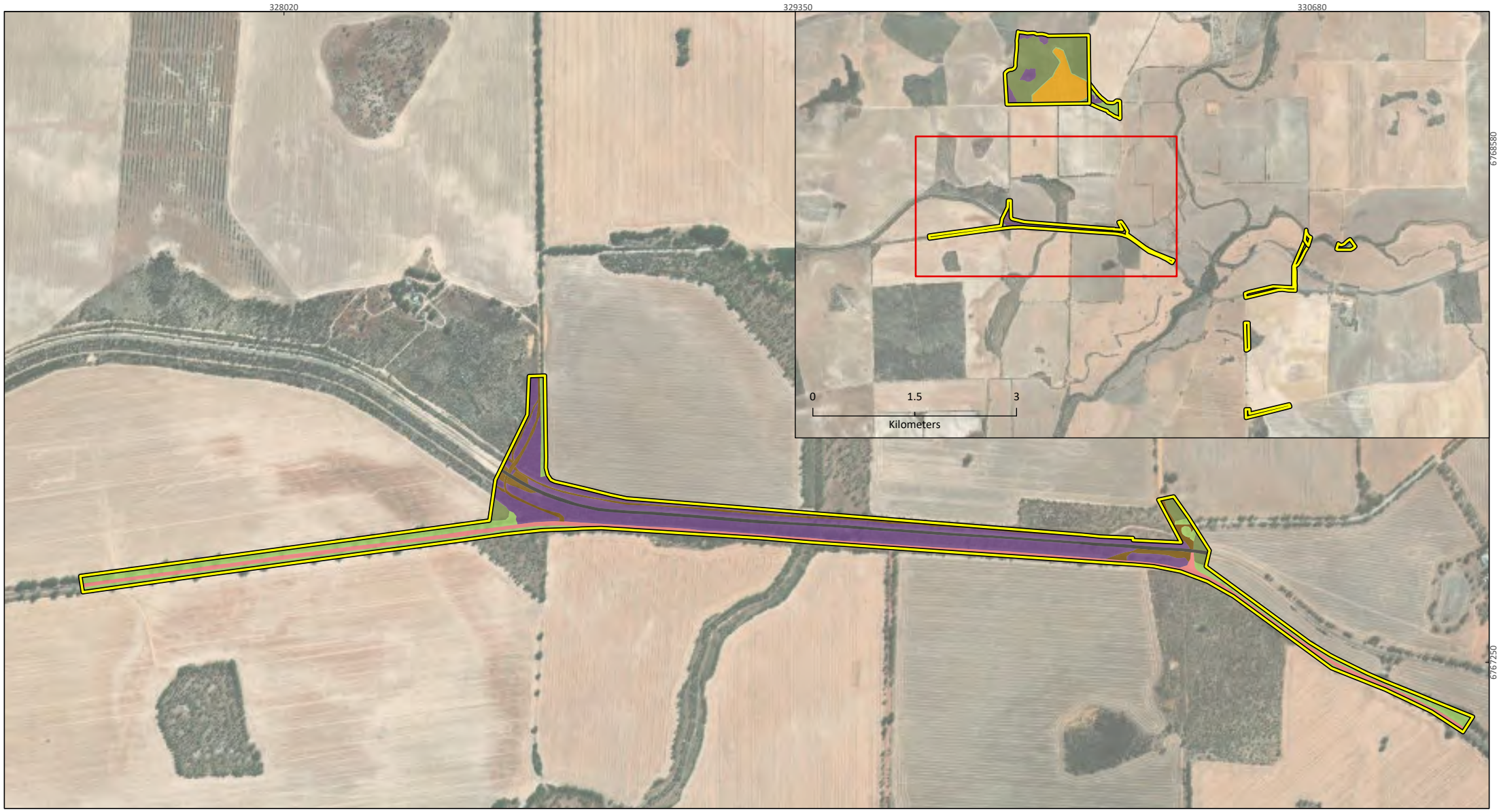
Three broad fauna habitat types with native vegetation were identified inside the study area. These fauna habitats included *Acacia* shrubland, Eucalypt woodland and riparian zones (Table 5-5; Figure 5-3). The *Acacia* shrublands were the dominant habitat type, followed by open Eucalypt woodlands and finally riparian zones. These broad habitat types occur in an array of land uses including agricultural areas and roadsides. Both the *Acacia* shrublands and Eucalypt woodlands may provide food resources for a range of species including black cockatoos, however these areas are in a highly degraded state, meaning their value for black cockatoos is likely to be limited (see tables Table 5-10 and Table 5-11 for further details on habitat condition). The only habitat that may provide nest hollows suitable for black cockatoos is the Eucalypt woodland habitat.

A brackish wetland surrounded by samphire and eucalypts is present in an abandoned channel of Irwin River adjacent to the study area (site L014), representing a distinct habitat type but not included in the table.

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

Habitat type	Site/s	Description	Extent in study area and % of study area	Representative photograph
Cleared	N/A	Areas cleared of natural vegetation for a variety of land uses including roads, tracks, rail line and agricultural areas.	82.21 ha 49.33%	-
Non-native Plantation	N/A	Historically cleared land that has been replanted with non-native shrub species.	31.63 ha 18.98%	-
Acacia Shrubland	L001, L003-SRE, L004, L007, L008, L009, and L010	Land dominated by mid to tall shrub cover of wattles, other *Acacia* and kwongan species; includes scattered eucalypts, as well as *Banksia* spp. and other potential food plants for black cockatoos.	23.15 ha 13.89%	

Habitat type	Site/s	Description	Extent in study area and % of study area	Representative photograph
Eucalypt woodland	L002, L003, L005, and L012	A mixture of spaced and dense *Eucalyptus* trees (and few mallees) over some shrubs (degraded, weedy understorey). Mostly planted, including a mixture of species that are native and non-native *Eucalypts* to the area, including many potential habitat trees.	28.25 ha 16.95%	
Riparian Zone	L006 (and L013* adjacent to study area)	Channels of Lockier or Irwin River, with eucalypts over grasses or dense weedy understorey, including rushes and other aquatic plants.	1.41 ha 0.85%	
Total	-	-	**166.65 ha** **100%**	-



Strategen-JBS&G
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Project No	1601
Date	7/12/2023
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Map author	KF

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Meters

1:13,300 (at A4) GDA 1994 MGA Zone 50

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Study area

Habitat

- Acacia shrubland
- Cleared (agriculture)
- Cleared (rail)
- Cleared (sealed road)
- Cleared (vehicle access)
- Cleared (vehicle tracks)
- Eucalypt Woodland

Figure 5-3a

Fauna habitats in the study area

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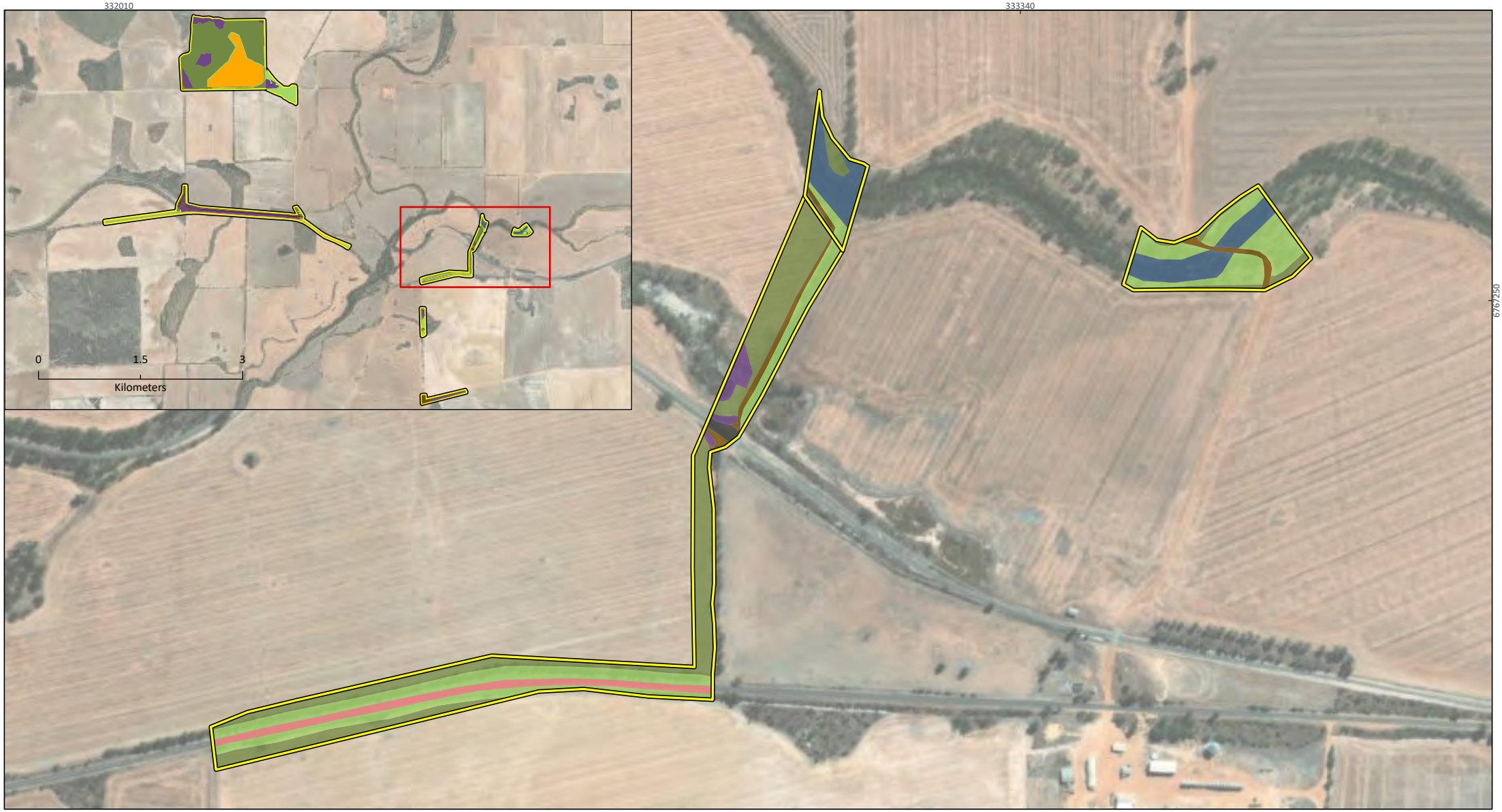

Strategen-JBS&G
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Map author	KF

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Study area

Habitat

- Acacia shrubland
- Cleared (agriculture)
- Cleared (rail)
- Cleared (sealed road)
- Cleared (vehicle access)
- Eucalypt Woodland
- Riparian Zone

Figure 5-3b

Fauna habitats in the study area

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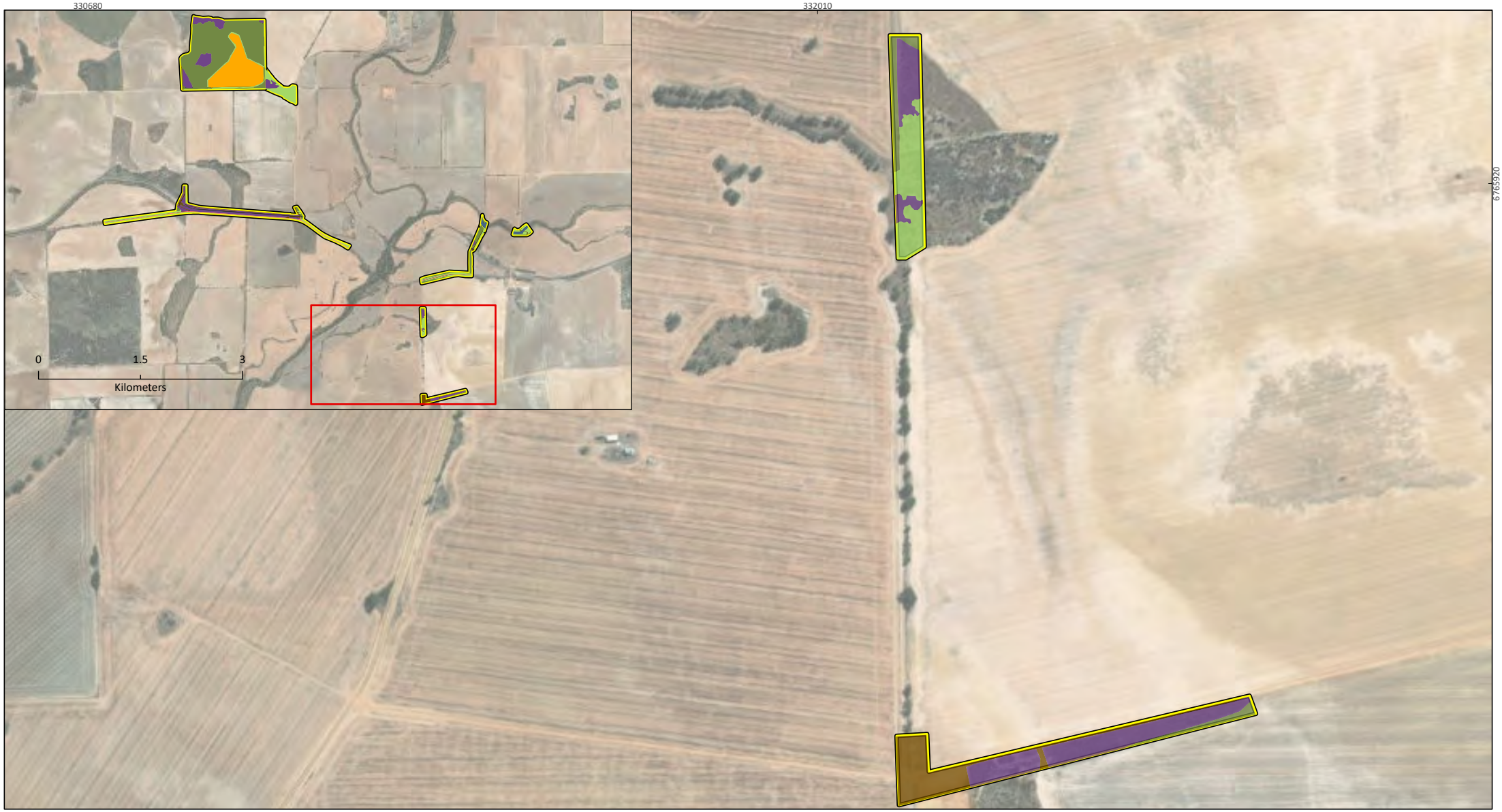

Strategen-JBS&G
Lockyer Development

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Map author	KF

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1:9,388 (at A4) GDA 1994 MGA Zone 50

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Study area

Habitat

- Acacia shrubland
- Cleared (agriculture)
- Cleared (vehicle access)
- Eucalypt Woodland

Figure 5-3c

Fauna habitats in the study area

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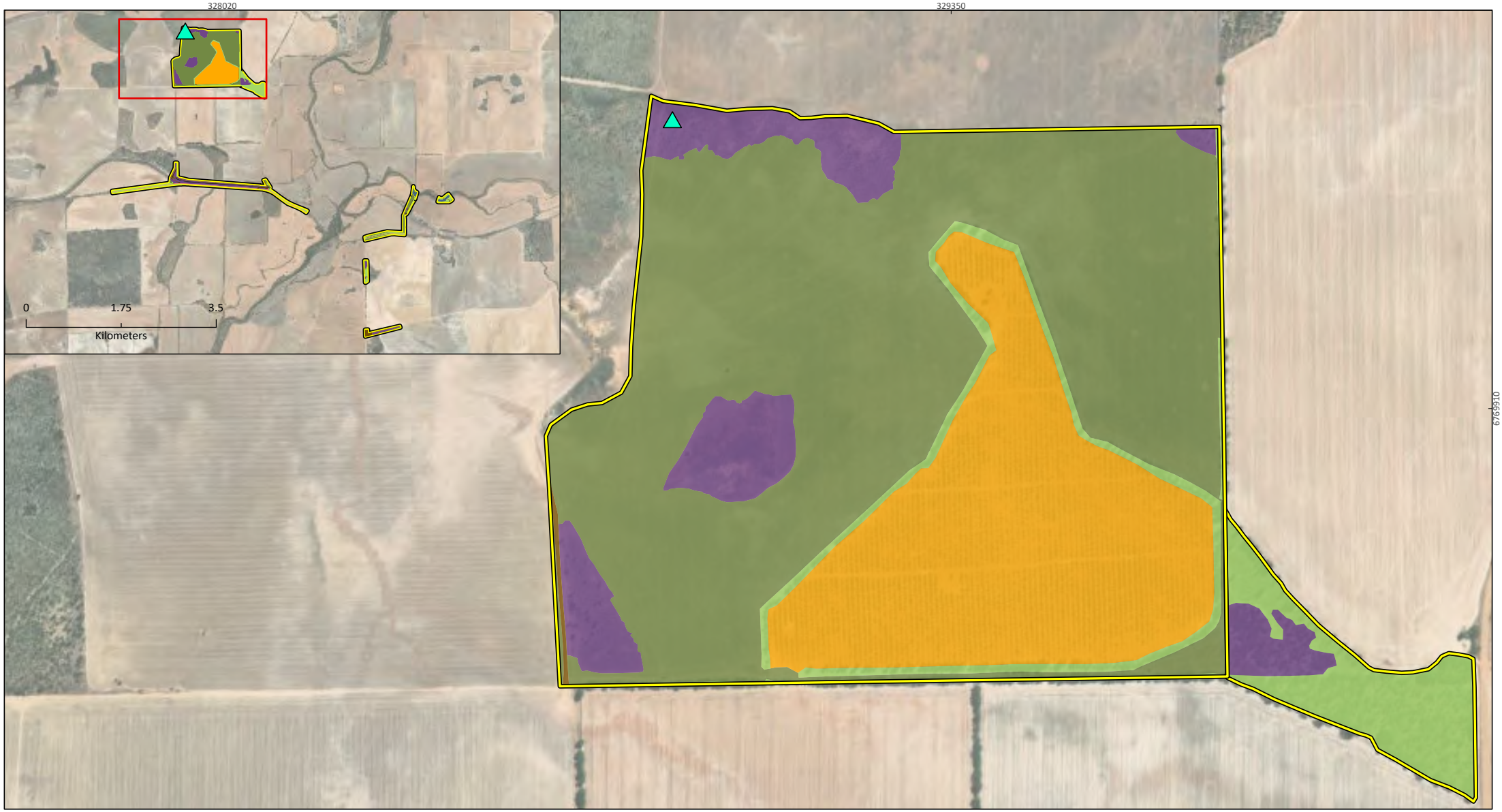

Strategen-JBS&G
Lockyer Development

Project No	1601
Date	7/12/2023
Drawn by	BK
Map author	KF

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Meters

1:9,400 (at A4) GDA 1994 MGA Zone 50

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Study area

Habitat

- Acacia shrubland
- Cleared (agriculture)
- Cleared (vehicle access)
- Eucalypt Woodland
- Non-native Plantation

Foraging evidence

- Carnaby's Black Cockatoo (*Zanda latirostris*, EN)

Figure 5-3d

Fauna habitats in the study area and significant fauna records

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5.3.1.2 Assemblage

A total of 51 terrestrial vertebrate species representing 30 families and 44 genera were recorded in the study area during the field surveys (Appendix e). The assemblage included 46 native species and 5 introduced species. The recorded assemblage represents 17.3% of the species identified in the desktop review (Table 5-6).

Table 5-6 Number of vertebrate species recorded during survey compared to desktop results

Group	No. species identified in desktop review	No. species recorded in survey
Amphibians	13	1
Reptiles	57	5
Birds	198 (inc. 4 introduced)	41 (inc. 2 introduced)
Mammals	27 (inc. 10 introduced)	4 (inc. 3 introduced)
Total	**295**	**51**

5.3.1.3 Significant vertebrate fauna

One Threatened vertebrate fauna species was recorded in the survey: foraging evidence on *Banksia* inflorescence at site L007 was attributed to Carnaby's Black Cockatoo (Table 5-7; Figure 5-3).

Table 5-7 Details of significant vertebrate fauna recorded during the field survey

Species	Status	Distribution and ecology	Survey records
Zanda latirostris Carnaby's Black Cockatoo	EN (EPBC & BC Acts)	Widespread and endemic to the south-west of WA. Occurring in the Wheatbelt and wetter regions of the Swan Coastal Plain, South-West and Southern Coast.	L007 – Foraging evidence on *Banksia* sp.

The likelihood of occurrence assessment for the remaining significant species identified in the desktop review (section 5.1.1) determined 7 species would possibly occur in the study area and 27 are unlikely to occur (Table 5-8).

Table 5-8 Likelihood of occurrence for significant vertebrate fauna identified in the desktop review

Species	Status	Likelihood of occurrence	Habitat	Fauna habitats within the study area			Comment
				Shrubland	*Eucalyptus* woodland	Riparian zone	
Reptiles							
Egernia stokesii subsp. *badia* Western Spiny-tailed Skink	EN/VU (EPBC Act; BC Act)	Unlikely	Occurs in semi-arid woodlands of the northern wheatbelt, sheltering in hollow logs and behind the bark of fallen trees in York Gum woodlands. It is also found in old buildings and under piles of timber, tiles or other building materials, and on granite boulder piles or outcrop with crevices (DCCEEW 2023b)		*		This species is known to occur in York Gum woodlands. There are also no records within 40 km of the study area.
Neelaps calonotos Black-striped Snake	P3 (DBCA list)	Unlikely	The Black-striped Snake is restricted to the sandy coastal strip of the Swan Coastal Plain between Mandurah and Lancelin, with some records existing inland at Gingin, Bullsbrook and Caversham (Storr *et al.* 2002). This species primarily occurs on dunes and sandplains vegetated with heaths and Banksia woodlands.				Absence of suitable dune and sandplain habitat.
Birds							
Actitis hypoleucos Common Sandpiper	Mig. (EPBC & BC Acts)	Possible	In WA the species is mostly coastal with some inland records (Geering *et al.* 2007) They are found across a wide range of wetlands: small ponds, large inlets and mudflats, where they forage on the shore usually close to the vegetation.			*	Suitable wetland habitat is not present in study area but marginally suitable riparian habitat occurs adjacent to it.

Species	Status	Likelihood of occurrence	Habitat	Fauna habitats within the study area			Comment
				Shrubland	*Eucalyptus* woodland	Riparian zone	
Anous tenuirostris subsp. *melanops* Australian Lesser Noddy	VU/EN (EPBC Act; BC Act)	Unlikely	Occurs in marine environments and nests on the Houtman Abrolhos islands and, possibly, Ashmore Reef.				Restricted to marine environments.
Apus pacificus Fork-tailed Swift	Mig. (EPBC & BC Acts)	Possible	Regular non-breeding migrant. Forages and roosts in flight so not limited by terrestrial habitat (DCCEEW 2023b); flocks most often seen ahead of cyclones or during thunderstorms (Johnstone *et al.* 2013).	*	*	*	Possibly occurs aerially in all habitats as not limited by terrestrial habitat.
Arenaria interpres Ruddy Turnstone	Mig. (EPBC & BC Acts)	Unlikely	In Australasia, the Ruddy Turnstone is mainly found on coastal regions with exposed rock coastlines or coral reefs. It also lives near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches (DCCEEW 2023b).				Absence of coastal habitat in the study area.
Calidris acuminata Sharp-tailed Sandpiper	Mig. (EPBC & BC Acts)	Possible	Occurs on muddy edges of shallow fresh or brackish wetlands such as coastal lagoons, estuaries, bays, swamps, lakes, inland hypersaline salt lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands (DCCEEW 2023b) (Higgins & Davies 1996).			*	Suitable wetland habitat is not present in study area but marginally suitable riparian habitat occurs adjacent to it.
Calidris canutus Red Knot	EN/Mig./EN (EPBC Act; BC Act)	Unlikely	Mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They rarely use				Absence of suitable coastal habitat in the study area.

Species	Status	Likelihood of occurrence	Habitat	Fauna habitats within the study area			Comment
				Shrubland	*Eucalyptus* woodland	Riparian zone	
			inland lakes or swamps (Higgins & Davies 1996).				
Calidris ferruginea Curlew Sandpiper	CR/Mig./CR (EPBC Act; BC Act)	Unlikely	Mainly occur on intertidal mudflats in sheltered coastal areas, also around non-tidal swamps, lakes, and lagoons near the coast (Higgins & Davies 1996).				Absence of suitable coastal or wetland habitat in the study area.
Calidris melanotos Pectoral Sandpiper	Mig. (EPBC & BC Acts)	Possible	Wetlands, inland as well as on the coast. Occurs on shallow fresh to saline wetlands, usually coastal or near-coastal but occasionally further inland (DCCEEW 2023b).			*	Suitable wetland habitat is not present in study area but marginally suitable riparian habitat occurs adjacent to it.
Calidris ruficollis Red-necked Stint	Mig. (EPBC & BC Acts)	Unlikely	Mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores (DCCEEW 2023b).				Absence of suitable coastal habitat in the study area.
Zanda latirostris Carnaby's Black Cockatoo	EN (EPBC & BC Acts)	Recorded	Occurs in uncleared or remnant native eucalypt woodlands, and in shrublands or kwongan heathlands dominated by hakea, dryandra, banksia and grevillea species (DAWE 2022; DCCEEW 2023b)	*	*	*	A few small areas of suitable habitats occur within the study area, however they are in a highly degraded state and are unlikely to support the species.
Falco hypoleucos Grey Falcon	VU (EPBC & BC Acts)	Unlikely	The Grey Falcon is a widespread but rare species inhabiting much of the hot, semi-arid and arid interior of Australia. Occurs in a wide variety of arid habitats including open woodlands and open *Acacia* shrubland, hummock and tussock grasslands and low	*	*	*	Although possibly suitable habitats occur within the study area, this species is restricted to the arid region

Species	Status	Likelihood of occurrence	Habitat	Fauna habitats within the study area			Comment
				Shrubland	*Eucalyptus* woodland	Riparian zone	
			shrublands, particularly where crossed by tree-lined water courses (Schoenjahn *et al.* 2019; Threatened Species Scientific Committee 2020).				and would rarely occur as far south as the study area.
Falco peregrinus Peregrine Falcon	OS (BC Act)	Possible	Preferred habitat includes cliffs and wooded watercourses. Nesting occurs mainly on cliff ledges, granite outcrops, quarries and in trees with old raven or Wedge-tailed Eagle nests (Johnstone & Storr 1998)			*	Potentially suitable foraging habitat occurs within the study area and has been previously recorded in the wider region.
Hydroprogne caspia Caspian Tern	Mig. (EPBC & BC Acts)	Unlikely	Found in sheltered coastal habitats and near-coastal terrestrial wetlands (DCCEEW 2023b).				Absence of suitable coastal habitat in the study area.
Leipoa ocellata Malleefowl	VU (EPBC & BC Acts)	Unlikely	Malleefowl occur mainly in scrubs and thickets of mallee (*Eucalyptus* spp.), boree (*Melaleuca lanceolata*) and bowgada (*Acacia linophylla*), and other dense litter-forming shrublands including Mulga Shrublands (Johnstone & Storr 2004). Nest mounds require sandy soil as well as abundant litter (Benshemesh 2007).	*			Although shrubland habitat is present in the study area, it was assessed as not being suitable for Malleefowl.
Limosa lapponica subsp. *menzbieri* Bar-tailed Godwit (northern Siberian)	CR/Mig./VU/Mig. (EPBC Act; BC Act)	Unlikely	Found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays (DCCEEW 2023b).				No suitable coastal habitat in the study area.
Motacilla cinerea Grey Wagtail	Mig. (EPBC & BC Acts)	Unlikely	Vagrant visitor to Australia that inhabits fast flowing streams and rivers (IUCN 2019).				Absence of suitable watercourse habitat in the study area.

Species	Status	Likelihood of occurrence	Habitat	Fauna habitats within the study area			Comment
				Shrubland	*Eucalyptus* woodland	Riparian zone	
Numenius madagascariensis Eastern Curlew	CR/Mig./CR (EPBC Act; BC Act)	Unlikely	Occurs mainly on intertidal mudflats, on exposed seagrass beds or mudflats (Geering *et al.* 2007). Also utilises sand spits of estuaries, mangroves, lake shores and ocean beaches.				Absence of suitable mudflat habitat in the study area.
Oxyura australis Blue-billed Duck	P4 (DBCA list)	Unlikely	Endemic to Australia's temperate regions, inhabiting terrestrial wetlands (fresh or saline) with extensive bordering vegetation, including artificial wetland, such as sewage ponds (Birdlife International 2015; del Hoyo *et al.* 2014).				Absence of suitable wetland habitat in the study area.
Pandion cristatus Osprey	Mig. (EPBC & BC Acts)	Unlikely	Occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. Occur in a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes (DCCEEW 2023b).				Absence of suitable coastal habitat in the study area.
Plegadis falcinellus Glossy Ibis	Mig. (EPBC & BC Acts)	Unlikely	Predominantly inhabits terrestrial wetlands, foraging in shallow water over soft substrate or on grassy or muddy verges of wetlands providing a variety of water depths. Inland, freshwater wetlands are preferred, especially permanent or ephemeral waterbodies on floodplains and shallow swamps with abundant aquatic flora (Johnstone *et al.* 2013; Marchant & Higgins 1990).				Absence of suitable wetland habitat in the study area.

Species	Status	Likelihood of occurrence	Habitat	Fauna habitats within the study area			Comment
				Shrubland	*Eucalyptus* woodland	Riparian zone	
Pluvialis fulva Pacific Golden Plover	Mig. (EPBC & BC Acts)	Unlikely	In Australia this species usually inhabits coastal habitats, on beaches, mudflats and sandflats (DCCEEW 2023b).				Absence of suitable coastal habitat in the study area.
Rostratula australis Australian Painted Snipe	EN (EPBC & BC Acts)	Unlikely	Generally, inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum *Muehlenbeckia* or canegrass or sometimes tea-tree (*Melaleuca*) (DCCEEW 2023b).				Absence of suitable wetland habitat in the study area.
Sterna albifrons White-shafted Little Tern	Mig. (BC Act)	Unlikely	In Australia, they inhabit sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets (DCCEEW 2023b).				Absence of suitable coastal habitat in the study area.
Sternula nereis subsp. *nereis* Fairy Tern	VU (EPBC & BC Acts)	Unlikely	In WA, the species is present along the entire coastline, with rare records from the far north (Kimberley) and off the Nullarbor Plain (Spineless Wonders 2015). It nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation.				Absence of suitable coastal habitat in the study area.
Thalasseus bergii Crested Tern	Mig. (BC Act)	Unlikely	Inhabits tropical and subtropical coastlines. Found along the entire Australian coast (IUCN 2019).				Absence of suitable coastal habitat in the study area.

Species	Status	Likelihood of occurrence	Habitat	Fauna habitats within the study area			Comment
				Shrubland	*Eucalyptus* woodland	Riparian zone	
Tringa brevipes Grey-tailed Tattler	Mig. (EPBC and BC Acts); P4 (DBCA list)	Unlikely	Occurs on sheltered coasts with reefs and rock platforms or mudflats, and can also be found on reefs or platforms that are exposed at low tide (DCCEEW 2023b).				Absence of suitable coastal habitat in the study area.
Tringa nebularia Common Greenshank	Mig. (EPBC & BC Acts)	Possible	Mostly on the coast but sometimes inland; uses permanent and ephemeral terrestrial wetlands, including rivers and creeks (DCCEEW 2023b).				Suitable wetland habitat is not present in study area, but occurs adjacent to it.
Tringa stagnatilis Marsh Sandpiper	Mig. (EPBC & BC Acts)	Possible	Inhabits coastal and inland wetlands, estuarine and mangrove mudflats, beaches, swamps, lakes and several other types of wetlands (Morcombe 2004).				Suitable wetland habitat is not present in study area, but occurs adjacent to it.
Xenus cinereus Terek Sandpiper	Mig. (EPBC & BC Acts)	Unlikely	Inhabits coastal mudflats, sheltered estuaries and lagoons. In Australia, it has a primarily coastal distribution, with occasional records inland (Morcombe 2004).				Absence of suitable coastal habitat in the study area.
Mammals							
Dasyurus geoffroii Chuditch	VU (EPBC & BC Acts)	Unlikely	Formerly widespread in very diverse habitats, now mostly in Jarrah forest and woodland of the southwest, also heath and mallee habitats along the south coast; uses horizontal hollow logs or earth burrows as refugia and dens (DEC 2012b).				Outside of current known range.
Hydromys chrysogaster Water-rat	P4 (DBCA list)	Unlikely	The Water-rat occupies habitats in the vicinity of permanent water, favouring areas with dense, low-lying vegetation, low density canopy cover, good water quality, narrow			*	Irwin River is potentially suitable habitat, but outside of current known range.

Species	Status	Likelihood of occurrence	Habitat	Fauna habitats within the study area			Comment
				Shrubland	*Eucalyptus* woodland	Riparian zone	
			water bodies and some habitat complexity (DEC 2012c; Speldewinde *et al.* 2013). Can also occur in mangrove and estuarine areas (IUCN 2019).				
Notamacropus irma Western Brush Wallaby	P4 (DBCA list)	Unlikely	Grazing species, occurs in open forest or woodland with low grasses and scrubby thickets, and also found in some areas of mallee and heathland (DEC 2012d).		*		Although woodland habitat is present in the study area, it is not considered of suitable quality for this species.
Parantechinus apicalis Dibbler	EN (EPBC & BC Acts)	Unlikely	Have been recorded over an extensive area and it is likely that they can occupy a diverse range of habitats. Dibblers seem to prefer vegetation with a dense canopy greater than 1 m high which has been unburnt for at least 10 years or more (DCCEEW 2023b).				Absence of suitable dense, heathland habitat in the study area.
Phascogale tapoatafa subsp. *wambenger* South-western Brush-tailed Phascogale	CD (BC Act)	Unlikely	This subspecies has been observed in dry sclerophyll forests and open woodlands that contain hollow-bearing trees. These nocturnal, arboreal carnivores forage for food under the bark of trees (DEC 2012a).				Outside of current known range, this subspecies is restricted to the southwest.

5.3.1.4 Potential breeding trees

A total of 160 PNT with DBH ≥500 mm were identified during the field survey, and a further 369 PNT with DBH 300-499 mm (Table 5-9). For most species of trees, suitable nest hollows only occur in live trees with a DBH of at least 500 mm, but trees with a diameter of 300-500 mm are considered to have the potential to develop nest hollows in the future (DAWE 2022). As noted above (4.2.6) species identification is not critical and does not affect size thresholds or suitability criteria under the current guidelines (i.e. DAWE 2022). For information on the PNT species that occur in the area, refer to the flora and vegetation survey completed by JBS&G (JBS&G 2023).

Table 5-9 Potential nesting trees identified during the survey

PNT (Eucalypt sp.)	Number of PNT	Mean DBH (mm)	Min DBH (mm)	Max DBH (mm)	Number of hollows
DBH ≥ 500 mm	160	668	500	1840	36
DBH 300 – 499 mm	369	360	300	490	1
Total	**529**				**37**

All the identified PNT occur in degraded, remnant vegetation areas, such as road verges and on the peripheries of crop, pasture and plantation paddocks, rather than high-quality roosting or foraging black cockatoo habitat (Table 5-10). While recording PNT, no evidence of hollow use by black cockatoos was recorded. Thirty seven hollows were recorded amongst the PNT, none of which were determined to be suitable for black cockatoo breeding. Two of the 37 hollows were recorded as occupied by European honeybees and one was occupied by Australian Ringnecks (*Platycercus zonarius*). The hollow occupied by Australian Ringnecks was considered to be of sufficient size and shape to be suitable for black cockatoos. The remaining hollows were deemed too small to provide suitable habitat for any black cockatoo species.

Table 5-10 Potential nesting trees per habitat type and condition

Site	Number of PNT (DBH 300-499 mm)	Number of PNT (DBH ≥ 500 mm)	Total number of PNT	Habitat type	Habitat condition
L002	0	1	1	Eucalypt Woodland	Degraded
L003	21	8	29	*Acacia* Shrubland	Degraded
L004	23	53	76	Eucalypt Woodland	Degraded
L005	50	28	78	Eucalypt Woodland	Degraded
L006	19	14	33	Riparian Zone	Degraded
L009	206	49	255	Eucalypt Woodland	Completely degraded
L010	26	0	26	Eucalypt Woodland	Degraded
L012	24	7	31	Eucalypt Woodland	Completely degraded
Total	**369**	**160**	**529**		

Note: Sites that had no PNT have been excluded

5.3.1.5 Black cockatoo habitat assessment

Carnaby's Black Cockatoo forage in native shrubland, kwongan heathland and woodland on flowers, seeds, nectar of proteaceous plant species (*Banksia* spp., *Hakea* spp. and *Grevillea* spp.) as well as *Callistemon* spp. and *Corymbia calophylla* (Marri), and also seeds of introduced species such as *Pinus*

spp. and *Erodium* spp. (DAWE 2022). Lists of plants used by this species are also given by Johnstone *et al.* (2010) and Groom (2011). Identification to species level of the plants present in the study area was beyond the scope of this survey, however species lists are available in the JBS&G report completed in 2023 for the same area (JBS&G 2023).

While traversing the study area, broad taxa of foraging plants were identified as part of site description and to assist with the foraging scores of the study area. These field records included *Banksia, Hakea* and *Grevillea* spp. in shrubland patches, and also *Lupinus* spp. (two of which occur in the study area, one a crop and the other an abundant weed in pasture and road verges). Records of plant species identified during flora survey were also extracted from the Phoenix database (Phoenix 2023a). While this is not an exhaustive list of the flora diversity, Table 5-11 provides an indication of the potential foraging value of the study area. Each site was also assigned to one of 5 categories for the condition of the vegetation: completely degraded (CD), degraded (D), good (G), very good (VG) or excellent (E).

Table 5-11 Foraging species per site and habitat condition

Site	Veg. condition	*Banksia* spp.	*Hakea spp.*	*Grevillea* spp.	*Acacia saligna*	*Lupinus* spp.	Total no. spp.	Comments
L001	D	•		•		•	**3**	Prolific weeds
L002	D		•	•		•	**3**	Prolific weeds
L003	D		•	•		•	**3**	High disturbance
L003-SRE	D						**0**	Quarry in L003
L004	D	•	•	•		•	**4**	Prolific weeds
L005	CD					•	**1**	Plantation
L006	D						**0**	Riparian woodland
L007	D	2	•			•	**4**	Breakaway inside cattle paddock. Foraging evidence on a single *Banksia* sp.
L008	D	•	2			•	**4**	Breakaway inside cattle paddock
L009	CD				•	•	**2**	Non-native shrub plantation with eucalypt border
L010	CD		•	•		•	**3**	Road verge
L012	CD					•	**1**	Road verge
L013	D						**0**	Riparian woodland
L014	D						**0**	Saline wetland

Foraging habitat quality was scored once for the entire study area, as per DAWE (2022). From a starting value of 10 (due to the presence of native shrubland, kwongan heathland and woodlands), the following subtraction was applied:

a) the study area is >12 km from known breeding habitat (-2)
b) the study area is >20 km from a known roost site (-1)

for a final foraging habitat quality score of 7 (Table 5-12).

Table 5-12 Foraging habitat quality scoring for the remnant native vegetation in the study area

Starting score	10
Foraging potential	-
Connectivity	-
Proximity to breeding	-2
Proximity to roosting	-1
Impact from significant plant disease	-
Total score	**7**

This score appears to be higher than it should have been, as only a single instance of foraging evidence was recorded (so -2 subtraction for foraging potential not applied). Additionally, aerial imagery indicates that remnant foraging habitat in the vicinity is sparse and highly fragmented, but another -2 is not applied for connectivity only because there are small shrubland patches just outside the study area near L001-L004 and L007.

The results highlight the limitations of the scoring tool presented in DAWE (2022), particularly so for a Project of this nature, which comprises numerous small, isolated remnants of native vegetation, generally in degraded or worse condition. As is evident in Table 5-11, and in previous Phoenix reports of this nature (Phoenix 2023b), the entire study area comprises vegetation in degraded or poor condition, and some sites lack any apparent foraging value altogether. Therefore, while the study area receives a high-quality rating (score of 7), none of these sites support an abundance of foraging habitat for black cockatoos.

The habitat quality scores based on the BCE scoring system (Bamford 2021b) are likely more accurate given the habitat condition present at all PNT sites (see Table 5-10). This tool has been accepted by DAWE for EPBC Act assessments and previous surveys in the region (Strategen JBS&G 2021a). Scores are based on the composition, condition, and structure of vegetation at each site, its context in terms of size and distance from potential breeding sites, and density of black cockatoos in the area. An overall score out of 10 combines the vegetation score (out of 6) with site context (out of 3) and species density (out of 1). The score is then moderated, in that if vegetation has a value of 0-2 (negligible to low foraging value) then context and species density score will be recorded as zero. Further details of this scoring system can be seen in Appendix h.

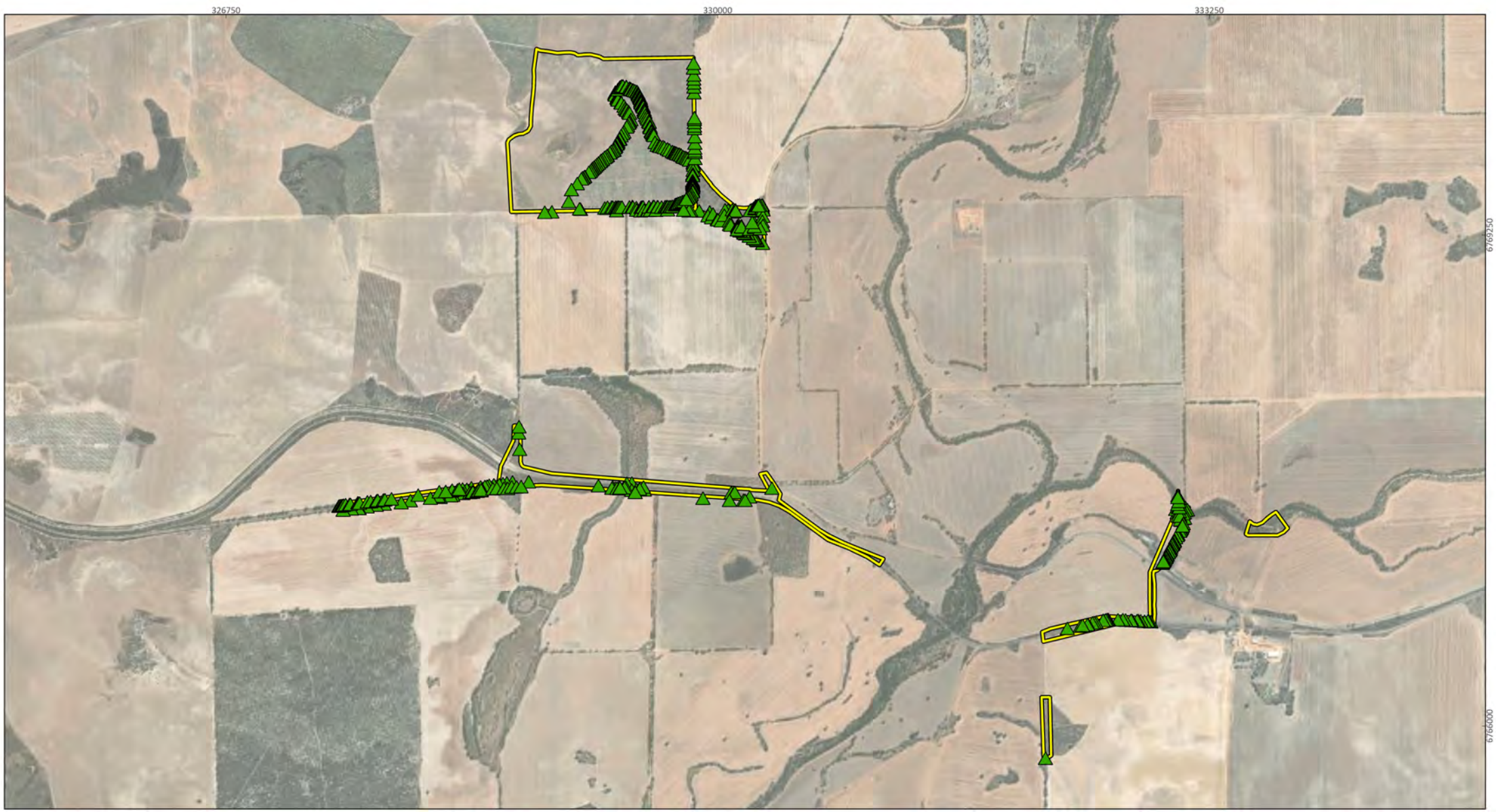
Vegetation scores can be seen below in Table 5-13, based on food sources described in the scoring system (Bamford 2021b), and other resources identified in a separate report (Valentine & Stock 2008). The vegatation scores were calculated based on the presence, density, and condition of banksia and eucalypts at each site, and then averaged across each habitat type. All sites were in a highly degraded state, which is supported by the JBS&G flora and vegetation report for the same area that recorded 77.8% of the study area as completely degraded, 19.6% as degraded, and the remaining 2.7% as either good or very good condition (JBS&G 2023).

As all habitat types received a vegetation score of 2 or less, the context and abundance scores are adjusted to 0 on the basis that birds will not use such areas unless they are adjacent to at least low-moderate quality foraging habitat valued at 3 or above. As such, the highest scoring habitat based on the BCE scoring system is 2/10 for the *Acacia* Shrubland.

Table 5-13 Black Cockatoo habitat quality ranking by habitat type

Habitat type	Vegetation score (/6)	Context score (/3)	Abundance score (/1)	Total (/10)
Cleared	0 Sites: none	0*	0*	0
Non-native Plantation	0 Sites: none	0*	0*	0
Acacia Shrubland	~2 Low foraging value Sites: L001 = 2, L003-SRE = 1, L004 = 2, L007 = 2, L008 = 2 , L009 = 2 , and L010 = 2	0*	0*	**2**
Eucalypt woodland	~1 Negligible to low foraging value Sites: L002 = 1, L003 = 2, L005 = 1, and L012= 1	0*	0*	**1**
Riparian Zone	0 No foraging value L006 = 0	0*	0*	**0**

*in all cases where vegetation score is 0-2, context and abundance scores are automatically set to zero.



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Lockyer Development

Project No	1601
Date	11/01/2024
Drawn by	BK
Map author	KF

0 0.5 1
Kilometer

1:33,900 (at A4) GDA 1994 MGA Zone 50

Study area
Potential nesting tree

Figure 5-4

Potential nesting trees recorded during the survey

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5.3.1.7 Malleefowl habitat assessment

Targeted searches for Malleefowl were carried out throughout the study area. No Malleefowl mounds or other forms of secondary evidence (e.g., tracks) were detected. Malleefowl habitat assessments were completed at all sites. A score of 4 is the lowest score necessary for the habitat to be considered suitable for Malleefowl (Table 5-14). To attain a score of 4 a site must have at least 4 of the following attributes in aggregate: sand, litter, level ground, trees such as mallee, mulga or Melaleuca, Triodia grasses and or a canopy sufficient for shade and protection from birds of prey. The study area contained few of these attributes, no scores were above 3 and therefore no site was considered suitable Malleefowl habitat.

Table 5-14 Malleefowl habitat assessment

Site	Litter	Sand	Ground level	Mallee	Mela-leuca	Mulga	Triodia	Canopy	Score	Malleefowl habitat
L001	1	1	0	0	0	0	0	0	2	No
L002	0	1	1	0	0	0	0	1	3	No
L003	0	1	1	0	0	0	0	1	3	No
L003 - SRE	0	0	1	0	0	0	0	0	1	No
L004	1	1	1	0	0	0	0	0	3	No
L005	1	1	1	0	0	0	0	0	3	No
L006	1	0	0	0	0	0	0	1	2	No
L007	0	1	1	0	0	0	0	0	2	No
L008	0	0	0	0	0	0	0	0	0	No
L009	1	1	0	0	0	0	0	0	2	No
L010	0	1	1	0	0	0	0	0	2	No
L012	1	1	0	0	0	0	0	0	2	No
L013	1	1	1	0	0	0	0	0	3	No
L014	0	1	1	0	0	0	0	0	2	No

5.3.1.8 Introduced species

Introduced species were evident throughout the study area, identified by tracks, scat or skeletal remains. Dog (*Canis familiaris*) was detected at site L004, Red Fox (*Vulpes vulpes*) at site L010, Rabbit (*Oryctolagus cuniculus*) at sites L001, L002 and L008, and European cattle (*Bos taurus*) at sites L008 and L009.

5.3.2 SRE invertebrate fauna

5.3.2.1 Habitats

Only site L003 (extending west towards L004) may provide a small amount of suitable SRE habitat; while highly disturbed, this area retains some native shrubland species and appears to retain slightly higher moisture levels than most parts of the study area, and this was the only area where invertebrates of SRE groups were recorded. Other shrubland patches investigated had even higher

levels of disturbance from agriculture and grazing, and do not provide enough habitat complexity or vegetation cover to support SRE taxa.

Eucalypt woodlands adjacent to riparian zones would typically be considered potential SRE habitat; however, most of the study area is heavily disturbed from historical clearing and livestock grazing. Furthermore, the ground is almost entirely covered by invasive weeds and grasses. Most of the Eucalypt woodland habitat was highly degraded (with planted trees) and did not contain enough leaf litter to support SRE invertebrates. No other habitats were identified within the study area that are suitable habitat for SRE invertebrates (Table 5-15; Figure 5-5).

Table 5-15 Extent and description of each SRE habitat in the study area

Habitat type	Site	Description	SRE habitat rating	Extent in study area and % of study area
Acacia shrubland	L003	Patchy eucalypts over shrubland including wattles and other *Acacia, Allocasuarina* and remnant kwongan species with grassy/weedy understorey, adjacent and between sealed road and railway.	Low	23.15 ha 13.89%

5.3.2.1.1 SRE records

A total of 12 specimens from known SRE groups were collected within the study area (Figure 5-5; Table 5-16). Of those 12 specimens collected, 2 Isopoda were rated as potential SRE, and one is an introduced widespread species. One likely SRE diplopod was recorded. The relatively low number of samples is likely due to the low amount of potential SRE habitat within the study area.

Table 5-16 Specimens from SRE groups recorded in the field survey

Higher order/ Family	Taxa	Site/s	Habitat/s	No. specimens	SRE status	Comments
Isopoda						
Philosciidae	*Laevophiloscia* '1'	L003	*Acacia* shrubland	5	Potential	
Armadillidae	*Buddelundia* 'Phoenix0150'	L003	*Acacia* shrubland	2	Potential	
Porcellionidae	*Porcellionides pruinosus*	L003-SRE	*Acacia* shrubland	2	Widespread	Introduced
Diplopoda						
Paradoxosomatidae	*Antichiropus* "DIP232"	L003	*Acacia* shrubland	3	Likely	

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Lockyer Development

Project No	1601
Date	28/11/2023
Drawn by	BK
Map author	KF

0 0.5 1
Kilometer

1:33,900 (at A4) GDA 1994 MGA Zone 50

Study area

Species, status

- *Antichiropus* "DIP232", likely
- *Buddelundia* 'Phoenix0150', potential
- *Laevophiloscia* '1', potential
- *Porcellionides pruinosus*, widespread

Figure 5-5

SRE invertebrate fauna recorded during the survey

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5.3.2.1.2 Idiosoma arenaceum

During the field survey no suitable habitat for *Idiosoma arenaceum* was identified. Targeted searches for burrows were conducted, however no burrows were detected throughout the field survey at any of the sites.

5.4 SURVEY LIMITATIONS

The limitations of the terrestrial fauna survey have been considered in accordance with EPA (EPA 2020).

Table 5-17 Consideration of potential survey limitations

Limitations	Comments
Availability of contextual information at a regional and local scale	There was a range of data to draw from previous field surveys and reports in the desktop review.
Competency/experience of the team carrying out the survey	The report authors and field teams have extensive experience in undertaking terrestrial fauna surveys in the region and were competent in sampling the target fauna.
Scope and completeness	All aspects of the initial scope were completed and all target groups were adequately sampled within suitable habitat where present. As suitable habitat was absent for some of the species identified in the desktop, no targeted surveys were undertaken for said taxa.
Proportion of fauna recorded and/or collected, any identification issues	The proportion of fauna records taken matches the scope and there were no identification issues.
Access within the study area	There were 2 areas that the fauna team was not permitted to access, so assessment for those is based on desktop sources and what could be seen from nearby accessible areas.
Timing, rainfall, season	While it did rain during the field survey, this was not a limitation that impacted the team's ability to complete the scope.
Disturbance that may have affected the results of the survey	No disturbances were apparent that were likely to have affected survey results.

6 DISCUSSION

6.1 VERTEBRATE FAUNA

6.1.1 Habitat and land use

The study area consists of relatively small, disconnected areas, all of which have been disturbed and are in degraded condition. The habitats within the study area occur in a variety of land uses such as agricultural use (both crop and cattle pasture), remnant road vegetation and plantations. Evidence of feral animals, firebreaks, historic clearing, vehicle tracks, weed infestation, litter, erosion channels, and human infrastructure at multiple sites was recorded (see Appendix b for disturbance recorded at each site).

The highest value fauna habitat within the study area is *Acacia* shrubland (13.89% of the study area), comprising (in part) remnant native kwongan vegetation and containing some food plant species that may be used by Carnaby's Black Cockatoo; the highest diversity of birds and most of the few reptiles were recorded in this habitat (as well as SRE invertebrates, see below).

Eucalypt woodland (16.95%) comprises mostly planted trees with little or no native understorey, currently of relatively low value as vertebrate habitat, but expected to become more significant as the trees age and form hollows suitable for nesting by Black Cockatoos.

The Riparian zones (0.85%) also contain trees with potential for nesting or roosting, as well as sheltered freshwater habitat supporting species unlikely to persist at dry-land sites. All sites within the study area contained evidence of disturbance. This is not surprising given the long history of intensive land use (predominantly crop and livestock farming) surrounding the study area.

6.1.2 Carnaby's Black Cockatoo (*Zanda latirostris*)

The survey was conducted during the July-December period when breeding as well as foraging activity by Carnaby's Black Cockatoo may be expected to occur. Foraging evidence on *Banksia* sp. attributed to this species was recorded once at site L007, indicating a low level of use of the area, but no sightings, calls, or evidence of breeding or roosting by this species was recorded.

Areas mapped as *Acacia* shrubland (Figure 5-3) contain remnant kwongan vegetation (e.g. species of *Banksia*, *Hakea*, *Grevillea*, *Allocasuarina*, wattles etc.) and represent foraging habitat for Carnaby's Black Cockatoo. Site L007 is a degraded example with few food plants and obvious damage by cattle and rabbits, but adjacent to better habitat just outside the study area. Other shrubland patches have other kinds of disturbance, e.g. the strip between L003 and L004, confined between the main road and a rail line. Other potential food plants occur in the study area outside this habitat type, e.g. two abundant species of *Lupinus* (one a crop, the other a weed in pasture and road verges).

Due to the high level of disturbance and exposure, and encroachment by pasture grasses and weeds, the current value of these foraging habitats is not adequately measured using the assessment tool from DAWE (2022), which would assign a 'high value' score (7) to the entire study area. Based on our observations, all CBC foraging habitat within the study area is degraded and of low quality, and rarely used.

As stated in section 5.3.1.4, 529 PNT (≥300 mm DBH, i.e. with potential to develop hollows in future if not already present) were recorded within or adjacent to the study area. Thirty seven hollows were identified during the survey, of which only one was deemed suitable for Black Cockatoo based on size and orientation (but apparently occupied by Australian Ringnecks). While the closest known breeding site for CBC is just 35 km southeast of the study area, and foraging evidence implies at least occasional use of the shrubland patches, it is unlikely that the limited foraging availability would result in any of these hollows providing useful breeding habitat for Carnaby's Black Cockatoo.

6.1.3 Malleefowl (*Leipoa ocellata*)

No evidence of current use by Malleefowl was recorded, and the habitat assessments concluded that no suitable habitat is present. In addition, the high detection rate of foxes recorded in the area (Phoenix 2023b) coupled with the detection of introduced predators in this survey further suggests Malleefowl breeding would be severely curtailed.

Thus, while the general area has recorded Malleefowl in the past (Table 5-3, Figure 5-1) it is considered unlikely the study area supports breeding of the species in its current state.

6.1.4 Introduced species

The fragmented, disturbed, and open nature of the study area and the long history of intensive land use surrounding the study area means it is highly accessible to introduced predators such as foxes, cats, and dogs; rabbits and cattle both alter vegetation structure. For this reason, the study area is far less likely to provide habitat for significant species as the assemblage of each envelope is highly vulnerable to predation.

6.2 SRE INVERTEBRATE FAUNA

Two Isopod species collected by foraging at site L003 (*Acacia* shrubland with some eucalypts) were identified as potential SRE taxa: *Laevophiloscia* '1' and *Buddelundia* 'Phoenix0150'. One Diplopoda specimen was categorised as likely SRE: *Antichiropus* "DIP232". The study area contained very limited suitable SRE habitat. L003-SRE, located between sites L003 and L004, is an old quarry with a southern facing rocky slope and litter-forming shrub vegetation, features that are typically conducive to supporting SRE taxa. However, foraging and litter sieving at site L003-SRE only returned 2 specimens of *Porcellionides pruinosus*, a widespread exotic.

6.2.1 *Laevophiloscia* '1'

Five specimens of *Laevophiloscia* '1' were collected during foraging. *Laevophiloscia* '1' is a data deficient species and has therefore been categorised as a potential SRE. Records indicated that *Laevophiloscia* '1' occupies drier areas of WA (Alacran 2022) and has recently been recorded in areas west of the study area (Spectrum 2022). Therefore, only part of this species distribution occurs within the study area. Given the fragmented and degraded nature of the study area, the *Laevophiloscia* '1' habitat in site L003 is unlikely to be significant habitat.

6.2.2 *Buddelundia* 'Phoenix0150'

Two specimens of *Buddelundia* 'Phoenix0150' were collected by foraging within site L003. *Buddelundia* as a group have not been completely sequenced and are a data deficient genus. The desktop records identified 4 potential SRE species from this genus within 100 km of the study area: *Buddelundia* '88' (96.48 km), *Buddelundia callosa* (90.73 km), *Buddelundia lateralis* (10.39 km) and *Buddelundia subinermis* (98.03 km) (Table 5-4). Given the relatively high potential for members of *Buddelundia* to be range restricted and categorised as SRE taxa, *Buddelundia* 'Phoenix0150' has been categorised as a potential SRE species. Given the lack of data available on this species, it is not possible to comment on the distribution of the population occurring in the study area.

6.2.3 Antichiropus "DIP232"

Three specimens of *Antichiropus* "DIP232" were collected while foraging at site L003. The desktop records indicate 5 confirmed SRE taxa from this genus located within 40 km of the study area; *Antichiropus* "DIP072" (28.09 km), *Antichiropus* "DIP076" (14.74 km), *Antichiropus* "DIP078" (19.58 km), *Antichiropus* "DIP099" (36.15 km) and *Antichiropus* "DIP136" (28.53 km) (Table 5-4). *Antichiropus* "DIP232" has been identified as a new species based on comparison of male gonopods of specimens from this survey; given the high number of confirmed SRE species located relatively close to the study area, it is likely that *Antichiropus* "DIP232" is an SRE.

6.2.4 *Idiosoma arenaceum*

No *Idiosoma arenaceum* were found in the study area during the survey. Foraging was conducted at all sites and no potential burrows or trapdoor spiders were detected. While invertebrates in general, and SREs, are known to survive in relatively small, isolated remnants (Major *et al.* 1999), the highly degraded nature of the vegetation of the majority of the remnants that comprise the study area means they are unlikely to support remnant *Idiosoma arenaceum* populations (EPA 2016c).

6.2.5 Introduced species

Two *Porcellionides pruinosus* specimens were collected during the field survey. This species was collected at site L003-SRE, a former quarry with shrubland of *Allocasuarina* and *Acacia* spp. *Porcellionides pruinosus* is an introduced species (Atlas of Living Australia 2023). The presence of this introduced species is unsurprising, given the degraded nature of the study area and the presence of other introduced species mentioned in this report.

6.3 CONCLUSION

The highly degraded vegetation that comprises the majority of the study area, which is situated in a landscaped defined by a long history of intensive use, means few of the remnants provide any utility for conservation significant fauna.

The area does not represent critical breeding habitat for Malleefowl or Carnaby's Black Cockatoo. While 593 PNT were identified, none of these trees currently contain suitable hollows for breeding. It also does not represent critical roosting habitat for Carnaby's Black Cockatoo. The study area does contain foraging habitat for Carnaby's Black Cockatoo. However, this is of low quality, with the highest scoring habitat (A*cacia* shrubland) scoring just 2/10 based on the BCE foraging habitat scoring tool.

Two potential SRE taxa and one likely SRE species were recorded at site L003, in *Acacia* shrubland with eucalypts present. Potential SRE species *Laevophiloscia* '1' has been documented outside of the study area, however *Buddelundia* 'Phoenix0150' (potential) is potentially a new species and *Antichiropus* "DIP232" (likely) is a new species, and their distributions are unknown.

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Appendix a Survey site locations

Site	Latitude	Longitude
L001	-29.2341	115.2747
L002	-29.2255	115.2732
L003	-29.2098	115.2547
L003-SRE	-29.2091	115.2421
L004	-29.2083	115.2378
L005	-29.1929	115.2532
L006	-29.2112	115.2827
L007	-29.1831	115.2398
L008	-29.189	115.241
L009	-29.1919	115.2495
L010	-29.2176	115.2762
L012	-29.2132	115.2818
L013	-29.2178	115.2665
L014	-29.2131	115.2814

Site details			
Site	**L001**	**Position (WGS84)**	-29.2341038, 115.2747448
Topography	undulating plain	**Soil texture**	sandy loam
Slope	gentle	**Rock type**	not recorded
Soil colour	whitish	**Rock cover (%)**	0

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Foraging	1	0	28 Aug 2023	28 Aug 2023
1	Birding	0.33	0	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)

Remnant vegetation with abundant weeds, vehicle and feral animal tracks. Wattle, Acacia, banksia, allocasurinas consist of the dense middle story. Weeds and small shrubs make up the under storey above sandy white loam.

Habitat	shrubland		
Disturbance	evidence of feral animals,firebreak,litter,weed infestation,current operations		
Vegetation condition	Degraded	**Fire age**	unsure
Total veg. cover (%)	160	**Litter distribution**	scattered
Tree cover (%)	5	**Litter depth(cm)**	1
Shrub cover (%)	80	**Litter cover (%)**	55
Grass cover (%)	65		
Herb cover (%)	10		

Site details			
Site	**L002**	**Position (WGS84)**	-29.2255451, 115.2732441
Topography	undulating plain	**Soil texture**	sandy loam
Slope	gentle	**Rock type**	none
Soil colour	whitish	**Rock cover (%)**	0

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Photo	0	1	28 Aug 2023	28 Aug 2023
1	Foraging	2	0	28 Aug 2023	28 Aug 2023

Site description - visit 1 (28 Aug 2023)

Eucalyptus saplings over Hakea allocasurinas with mature Eucalypts sparsely occurring. Middle story is sparse and open while lower storey is dominated by weeds and grasses.

Habitat	open woodland		
Disturbance	current operations,weed infestation,historic clearing		
Vegetation condition	Degraded	**Fire age**	unsure
Total veg. cover (%)	140	**Litter distribution**	sparse
Tree cover (%)	40	**Litter depth(cm)**	1
Shrub cover (%)	10	**Litter cover (%)**	20
Grass cover (%)	75		
Herb cover (%)	15		

Site details			
Site	**L003**	**Position (WGS84)**	-29.2097857, 115.2547244
Topography	undulating plain	**Soil texture**	clay loam
Slope	gentle	**Rock type**	none
Soil colour	brown	**Rock cover (%)**	0

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Foraging	2	0	29 Aug 2023	29 Aug 2023
1	Birding	0.66	0	29 Aug 2023	29 Aug 2023

Site description - visit 1 (28 Aug 2023)

Open road and railway segregating wattles, acacias, and eucalypts. Middle story is open and infested with weeds, young wattle plants occur atop low lying weeds and grasses.

Habitat	open woodland		
Disturbance	current operations,firebreak,weed infestation,vehicle tracks,historic clearing,evidence of feral animals		
Vegetation condition	Degraded	**Fire age**	unsure
Total veg. cover (%)	140	**Litter distribution**	sparse
Tree cover (%)	15	**Litter depth(cm)**	1
Shrub cover (%)	45	**Litter cover (%)**	25
Grass cover (%)	65		
Herb cover (%)	15		

Site details			
Site	**L003-SRE**	**Position (WGS84)**	-29.2091079, 115.2421306
Topography	foot slope	**Soil texture**	clay loam
Slope	gentle	**Rock type**	granite - outcropping
Soil colour	orange	**Rock cover (%)**	20

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Foraging	1.5	0	31 Aug 2023	31 Aug 2023

Site description - visit 1 (31 Aug 2023)

Old quarry on roadside, one eucalypt over dense areas of dense shrub of acacias. Substrate is mostly gravel and leaf litter.

Habitat	shrubland		
Disturbance	current operations,excavation,historic clearing,litter,weed infestation		
Vegetation condition	Degraded	**Fire age**	unsure
Total veg. cover (%)	90	**Litter distribution**	scattered
Tree cover (%)	10	**Litter depth(cm)**	1
Shrub cover (%)	80	**Litter cover (%)**	50
Grass cover (%)	0		
Herb cover (%)	0		

Site details			
Site	**L004**	**Position (WGS84)**	-29.2082743, 115.2377707
Topography	undulating plain	**Soil texture**	clay loam
Slope	gentle	**Rock type**	none
Soil colour	brown	**Rock cover (%)**	0

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Foraging	1	0	30 Aug 2023	30 Aug 2023
1	Birding	0.66	0	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)

Shrubland dissected by tracks, road and railway. Sparsely occurring eucalypts and allocasurinas over banksia, acacias and grevillea. Understory infested with weeds and small herbs.

Habitat	shrubland		
Disturbance	current operations,firebreak,vehicle tracks,weed infestation		
Vegetation condition	Degraded	**Fire age**	unsure
Total veg. cover (%)	162	**Litter distribution**	even/continuous
Tree cover (%)	20	**Litter depth(cm)**	1
Shrub cover (%)	70	**Litter cover (%)**	65
Grass cover (%)	60		
Herb cover (%)	12		

Site details			
Site	**L005**	**Position (WGS84)**	-29.192932, 115.2532175
Topography	undulating plain	**Soil texture**	clay loam
Slope	gentle	**Rock type**	none
Soil colour	brown	**Rock cover (%)**	0

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Foraging	1	0	29 Aug 2023	29 Aug 2023

Site description - visit 1 (29 Aug 2023)

Open plantation of powderbark. Very little middle storey evident with sparsely occurring wattles and other eucalypts. Grass and leaf litter cover the brown loam substrate.

Habitat	open woodland		
Disturbance	current operations,historic clearing,grazing-medium,weed infestation,vehicle tracks		
Vegetation condition	Degraded	**Fire age**	unsure
Total veg. cover (%)	137	**Litter distribution**	even/continuous
Tree cover (%)	40	**Litter depth(cm)**	1
Shrub cover (%)	2	**Litter cover (%)**	85
Grass cover (%)	90		
Herb cover (%)	5		

Site details			
Site	**L006**	**Position (WGS84)**	-29.2111602, 115.2826902
Topography	drainage line	**Soil texture**	clay loam
Slope	moderate	**Rock type**	none
Soil colour	brown	**Rock cover (%)**	0

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Camera trap	43.17	0	29 Aug 2023	31 Aug 2023
1	Foraging	1	0	29 Aug 2023	29 Aug 2023
1	Birding	0.33	0	31 Aug 2023	31 Aug 2023

Site description - visit 1 (29 Aug 2023)

Moderate slope encompassing river and drainage line. Powderbark eucalypts are mature and widely dispersed. Thick bullrush occurs throughout the water with some muddy puddles

Habitat	riparian zone		
Disturbance	current operations,erosion channels,weed infestation		
Vegetation condition	Degraded	**Fire age**	unsure
Total veg. cover (%)	145	**Litter distribution**	even/continuous
Tree cover (%)	25	**Litter depth(cm)**	3
Shrub cover (%)	30	**Litter cover (%)**	70
Grass cover (%)	80		
Herb cover (%)	10		

Site details			
Site	**L007**	**Position (WGS84)**	-29.183148, 115.2397668
Topography	breakaway	**Soil texture**	clay loam
Slope	moderate	**Rock type**	granite - outcropping
Soil colour	brown	**Rock cover (%)**	5

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Black cockatoo habitat assessment site	0	1	30 Aug 2023	30 Aug 2023
1	Foraging	1.5	0	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)

Breakaway inside a paddock. No upper storey other than two banksias in poor condition. Knee high shrubs and grasses cover the understory

Habitat	shrubland		
Disturbance	current operations,grazing-high,historic clearing,livestock tracks,weed infestation		
Vegetation condition	Degraded	**Fire age**	unsure
Total veg. cover (%)	120	**Litter distribution**	none
Tree cover (%)	0	**Litter depth(cm)**	0
Shrub cover (%)	50	**Litter cover (%)**	0
Grass cover (%)	50		
Herb cover (%)	20		

Site details			
Site	**L008**	**Position (WGS84)**	-29.1889725, 115.2409901
Topography	breakaway	**Soil texture**	laterite
Slope	moderate	**Rock type**	laterite,granite - outcropping
Soil colour	orange	**Rock cover (%)**	5

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Foraging	3	0	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)

Breakaway in a cattle paddock. No upper storey present, shrubs make up the middle and lower storey but are relatively open upon the rocky substrate.

Habitat	shrubland		
Disturbance	current operations,grazing-high,historic clearing,weed infestation,vehicle tracks,livestock tracks		
Vegetation condition	Degraded	**Fire age**	unsure
Total veg. cover (%)	80	**Litter distribution**	none
Tree cover (%)	0	**Litter depth(cm)**	0
Shrub cover (%)	70	**Litter cover (%)**	0
Grass cover (%)	5		
Herb cover (%)	5		

Site details			
Site	**L009**	**Position (WGS84)**	-29.191868, 115.2494925
Topography	hill slope	**Soil texture**	sandy loam
Slope	gentle	**Rock type**	none
Soil colour	whitish	**Rock cover (%)**	0

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Foraging	1	0	30 Aug 2023	30 Aug 2023
1	Birding	0.66	0	30 Aug 2023	30 Aug 2023

Site description - visit 1 (30 Aug 2023)

Revegetated paddock, boundary is lined with eucalypts, while centre has been planted with introduced shrubs. Upper and middle storey are not well defined and weed infestation dominates the substrate.

Habitat	shrubland		
Disturbance	current operations,grazing-high,historic clearing,livestock tracks,vehicle tracks,weed infestation		
Vegetation condition	Degraded	**Fire age**	unsure
Total veg. cover (%)	120	**Litter distribution**	sparse
Tree cover (%)	10	**Litter depth(cm)**	1
Shrub cover (%)	80	**Litter cover (%)**	50
Grass cover (%)	20		
Herb cover (%)	10		

Site details			
Site	**L010**	**Position (WGS84)**	-29.2176197, 115.2761609
Topography	undulating plain	**Soil texture**	sandy loam
Slope	moderate	**Rock type**	none
Soil colour	whitish	**Rock cover (%)**	0

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Foraging	1	0	30 Aug 2023	30 Aug 2023
1	Birding	0.33	0	31 Aug 2023	31 Aug 2023

Site description - visit 1 (30 Aug 2023)

Remnant roadside vegetation dissect with a busy road. Eucalypts line the sides while wattles and other acacias occur widely dispersed. Weeds and grasses dominate the substrate.

Habitat	shrubland		
Disturbance	current operations,grazing-high,vehicle tracks,weed infestation		
Vegetation condition	Degraded	**Fire age**	unsure
Total veg. cover (%)	145	**Litter distribution**	sparse
Tree cover (%)	25	**Litter depth(cm)**	1
Shrub cover (%)	30	**Litter cover (%)**	30
Grass cover (%)	80		
Herb cover (%)	10		

Site details			
Site	**L012**	**Position (WGS84)**	-29.2131761, 115.2818352
Topography	floodplain	**Soil texture**	loamy sand
Slope	gentle	**Rock type**	none
Soil colour	red-orange	**Rock cover (%)**	0

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Foraging	1	0	31 Aug 2023	31 Aug 2023
1	Birding	0.66	0	31 Aug 2023	31 Aug 2023

Site description - visit 1 (31 Aug 2023)

Eucalyptus trees lining a vehicle track and crop. No middle or lower storey present other than weeds. Thick leaf litter covers the substrate.

Habitat	open woodland		
Disturbance	current operations,erosion channels,historic clearing,firebreak,weed infestation		
Vegetation condition	Completely Degrade	**Fire age**	unsure
Total veg. cover (%)	80	**Litter distribution**	concentrated in drifts
Tree cover (%)	80	**Litter depth(cm)**	2
Shrub cover (%)	0	**Litter cover (%)**	80
Grass cover (%)	0		
Herb cover (%)	0		

Site details			
Site	**L013**	**Position (WGS84)**	-29.2178027, 115.2665175
Topography	riparian zone	**Soil texture**	laterite
Slope	gentle	**Rock type**	none
Soil colour	brown	**Rock cover (%)**	

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Birding	0.33	0	31 Aug 2023	31 Aug 2023

Site description - visit 1 (31 Aug 2023)

Scattered eucalypts and acacias surrounding lockier river. Middle storey is not apparent, while substrate is heavily covered in weeds.

Habitat	riparian zone		
Disturbance	current operations,historic clearing,weed infestation		
Vegetation condition	Degraded	**Fire age**	unsure
Total veg. cover (%)	155	**Litter distribution**	none
Tree cover (%)	35	**Litter depth(cm)**	1
Shrub cover (%)	30	**Litter cover (%)**	0
Grass cover (%)	80		
Herb cover (%)	10		

Site details			
Site	**L014**	**Position (WGS84)**	-29.2130681, 115.2814391
Topography	floodplain	**Soil texture**	clay loam
Slope	gentle	**Rock type**	none
Soil colour	brown	**Rock cover (%)**	0

Sample and effort summary

Visit	Sample method	Sample quant. (hrs)	Repli-cation	Date start	Date stop
1	Foraging	2	0	31 Aug 2023	31 Aug 2023

Site description - visit 1 (31 Aug 2023)

Brackish wetland surrounded by samphire and eucalypts. Upper and middle storey is not well defined. Lower storey is infested with weeds and shrublands atop brown moist substrate.

Habitat	waterhole		
Disturbance	erosion channels,vehicle tracks,weed infestation		
Vegetation condition	Degraded	**Fire age**	unsure
Total veg. cover (%)	100	**Litter distribution**	none
Tree cover (%)	30	**Litter depth(cm)**	0
Shrub cover (%)	45	**Litter cover (%)**	0
Grass cover (%)	25		
Herb cover (%)	0		

Appendix c Vertebrate fauna desktop and field survey results

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
Amphibians (13)											
Pelodryadidae	*Litoria adelaidensis*	Slender Tree Frog				•					
	Litoria moorei	Motorbike Frog				•					
Limnodynastidae	*Heleioporus albopunctatus*	Western Spotted Frog				•					
	Heleioporus eyrei	Moaning Frog				•					
	Heleioporus psammophilus	Sand Frog				•					
	Limnodynastes dorsalis	Western Banjo Frog				•			•		•
	Neobatrachus kunapalari	Kunapalari Frog				•					
	Neobatrachus pelobatoides	Humming Frog				•					
	Neobatrachus sutor	Shoemaker Frog				•					
	Neobatrachus wilsmorei	Plonking Frog				•					
Myobatrachidae	*Crinia pseudinsignifera*	Bleating Froglet				•					
	Myobatrachus gouldii	Turtle Frog				•					
	Pseudophryne guentheri	Crawling Toadlet				•					
Reptiles (57)											
Agamidae	*Amphibolurus longirostris*	Long-nosed Dragon				•					
	Ctenophorus adelaidensis	Southern Heath Dragon				•	•				
	Ctenophorus m. maculatus	Spotted Military Dragon				•	•				
	Ctenophorus nuchalis	Central Netted Dragon				•					•

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
	Ctenophorus reticulatus	Western Netted Dragon				•					
	Ctenophorus scutulatus	Lozenge-marked Dragon				•					
	Moloch horridus	Thorny Devil				•					
	Pogona minor	Dwarf Bearded Dragon				•				•	
Gekkonidae	*Gehyra variegata*	Variegated Dtella				•					•
	Heteronotia binoei	Bynoe's Gecko				•					
Carphodactylidae	*Nephrurus levis occidentalis*	Smooth Knobtail Gecko				•					
Diplodactylidae	*Crenadactylus ocellatus*	Clawless Gecko				•					
	Diplodactylus ornatus	Ornate Stone Gecko				•					
	Diplodactylus pulcher	Fine-faced gecko				•					
	Lucasium maini	Main's Ground Gecko				•					
	Strophurus spinigerus	Soft Spiny-tail Gecko				•					
Pygopodidae	*Delma fraseri fraseri*	Fraser's Legless Lizard				•					
	Delma tincta	Excitable Delma				•					
	Lialis burtonis	Burton's Legless Lizard				•	•		•		
	Pletholax gracilis	Keeled Legless Lizard				•					
	Pygopus lepidopodus	Common Scaly Foot				•					
Scincidae	*Cryptoblepharus buchananii*	Buchanan’s Snake-eyed Skink				•					
	Cryptoblepharus plagiocephalus	Peron's Snake-eyed Skink									•

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
	Ctenotus fallens	West Coast Laterite Ctenotus				•					
	Ctenotus leonhardii	Leonhard's Ctenotus				•					
	Ctenotus pantherinus	Leopard Ctenotus				•	•				
	Cyclodomorphus branchialis	Gilled Slender Blue-tongue Skink	VU (BC Act)					•			
	Egernia stokesii badia	Western Spiny-tailed Skink	EN/VU (EPBC Act; BC Act)		•						
	Lerista distinguenda	Orange-tailed Slider				•					
	Lerista elegans	Elegant Slider				•					
	Lerista gerrardii	Bold-striped Robust Slider				•					
	Lerista kingi	King's Three-toed Slider				•					
	Lerista lineopunctulata	Dotted-line Robust Slider				•					
	Lerista planiventralis decora	Keeled Slider				•					
	Lerista praepedita	Blunt-tailed West Coast Slider				•					
	Menetia greyii	Common Dwarf Skink				•					
	Menetia surda	Western Dwarf Skink				•					
	Tiliqua occipitalis	Western Bluetongue				•					
	Tiliqua rugosa	Bobtail				•	•		•	•	•
Varanidae	*Varanus gouldii*	Bungarra or Sand Monitor				•					
Typhlopidae	*Anilios australis*	Southern Blindsnake				•					•
	Anilios waitii	Waite's Blindsnake				•					

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
Pythonidae	*Antaresia childreni*	Children's python				•					
	Aspidites ramsayi	Woma						•			
	Morelia spilota imbricata	Southwestern Carpet Python				•					
Elapidae	*Demansia reticulata*	Reticulated Whipsnake				•					
	Echiopsis curta	Bardick					•				
	Elapognathus coronatus	Crowned Snake				•					
	Neelaps calonotos	Black-striped Snake	P3 (DBCA list)			•		•			
	Notechis scutatus	Tiger Snake							•		
	Suta gouldii	Gould's Hooded Snake				•					
	Suta monachus	Monk Snake				•					
	Pseudechis australis	Mulga Snake				•					
	Pseudonaja mengdeni	Western Brown Snake				•					
	Pseudonaja nuchalis	Gwardar				•					
	Simoselaps bertholdi	Jan's Banded Snake				•					
	Simoselaps littoralis	West Coast Banded Snake				•					
Birds (198)											
Casuariidae	*Dromaius novaehollandiae*	Emu				•	•		•		
Anatidae	*Anas castanea*	Chestnut Teal				•					
	Anas gracilis	Grey Teal				•					
	Anas platyrhynchos	Mallard			•	•					

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
	Anas rhynchotis	Australasian Shoveler				•					
	Anas superciliosa	Pacific Black Duck				•			•		
	Aythya australis	Hardhead				•					
	Biziura lobata	Musk Duck				•					
	Chenonetta jubata	Australian Wood Duck				•					
	Cygnus atratus	Black Swan				•					
	Malacorhynchus membranaceus	Pink-eared Duck				•					
	Oxyura australis	Blue-billed Duck	P4 (DBCA list)			•		•			
	Tadorna tadornoides	Australian Shelduck				•					
Megapodiidae	*Leipoa ocellata*	Malleefowl	VU (EPBC & BC Acts)		•	•		•			
Phasianidae	*Coturnix pectoralis*	Stubble Quail				•					
	Coturnix ypsilophora	Brown Quail				•	•				
Podargidae	*Podargus strigoides*	Tawny Frogmouth				•					
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar				•					
Apodidae	*Apus pacificus*	Fork-tailed Swift	Mig. (EPBC & BC Acts)		•			•			
Otididae	*Ardeotis australis*	Australian Bustard				•					
Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo				•					•
	Cacomantis pallidus	Pallid Cuckoo				•				•	

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
	Chrysococcyx basalis	Horsfield's Bronze Cuckoo				•	•		•	•	
	Chrysococcyx lucidus	Shining Bronze Cuckoo				•	•				•
Columbidae	*Columba livia*	Domestic Pigeon		*	•	•					
	Geopelia cuneata	Diamond Dove				•					
	Geopelia humeralis	Bar-shouldered Dove									
	Ocyphaps lophotes	Crested Pigeon				•	•		•	•	•
	Phaps chalcoptera	Common Bronzewing				•	•		•	•	
	Phaps elegans	Brush Bronzewing				•					
	Streptopelia senegalensis	Laughing Turtle-Dove		*	•	•					•
Rallidae	*Fulica atra*	Eurasian Coot				•					
	Gallirallus philippensis mellori	Buff-banded Rail				•					•
	Porzana fluminea	Australian Spotted Crake				•					
	Tribonyx ventralis	Black-tailed Native-hen				•					
Podicipedidae	*Poliocephalus poliocephalus*	Hoary-headed Grebe				•					
	Tachybaptus novaehollandiae	Australasian Grebe				•					
Turnicidae	*Turnix varius*	Painted Button-quail				•					
	Turnix velox	Little Button-quail				•				•	
	Himantopus himantopus	Black-winged Stilt				•					

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
Recurvirostridae	*Recurvirostra novaehollandiae*	Red-necked Avocet				•					
Charadriidae	*Charadrius ruficapillus*	Red-capped Plover				•					
	Elseyornis melanops	Black-fronted Dotterel				•					
	Erythrogonys cinctus	Red-kneed Dotterel				•					
	Peltohyas australis	Inland Dotterel				•					
	Pluvialis fulva	Pacific Golden Plover	Mig. (EPBC & BC Acts)			•					
	Vanellus tricolor	Banded Lapwing				•					
Rostratulidae	*Rostratula australis*	Australian Painted Snipe	EN (EPBC & BC Acts)		•						
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	Mig. (EPBC & BC Acts)		•	•		•			
	Arenaria interpres	Ruddy Turnstone	Mig. (EPBC & BC Acts)			•		•			
	Calidris acuminata	Sharp-tailed Sandpiper	Mig. (EPBC & BC Acts)		•	•		•			
	Calidris canutus	Red Knot	EN/Mig./EN (EPBC Act; BC Act)		•						
	Calidris ferruginea	Curlew Sandpiper	CR/Mig./CR (EPBC Act; BC Act)		•						

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
	Calidris melanotos	Pectoral Sandpiper	Mig. (EPBC & BC Acts)		•						
	Calidris ruficollis	Red-necked Stint	Mig. (EPBC & BC Acts)			•		•			
	Limosa lapponica menzbieri	Bar-tailed Godwit (northern Siberian)	CR/Mig./VU/Mig. (EPBC Act; BC Act)		•			•			
	Numenius madagascariensis	Eastern Curlew	CR/Mig./CR (EPBC Act; BC Act)		•						
	Tringa brevipes	Grey-tailed Tattler	Mig. EPBC and BC Acts; P4 DBCA list			•		•			
	Tringa nebularia	Common Greenshank	Mig. (EPBC & BC Acts)		•	•		•			
	Tringa stagnatilis	Marsh Sandpiper	Mig. (EPBC & BC Acts)			•		•			
	Xenus cinereus	Terek Sandpiper	Mig. (EPBC & BC Acts)			•					
Laridae	*Anous tenuirostris melanops*	Australian Lesser Noddy	VU/EN (EPBC Act; BC Act)		•	•		•			
	Hydroprogne caspia	Caspian Tern	Mig. (EPBC & BC Acts)			•		•			
	Larus pacificus	Pacific Gull				•					

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
	Sterna albifrons	White-shafted Little Tern	Mig. (BC Act)			•					
	Sternula n. nereis	Fairy Tern	VU (EPBC & BC Acts)		•	•					
	Thalasseus bergii	Crested Tern	Mig. (BC Act)			•		•			
Sulidae	*Morus serrator*	Australasian Gannet				•					
Anhingidae	*Anhinga novaehollandiae*	Australasian Darter				•					
Phalacrocoracidae	*Phalacrocorax carbo*	Great Cormorant				•					
	Phalacrocorax melanoleucos	Little Pied Cormorant				•					
	Phalacrocorax sulcirostris	Little Black Cormorant				•					
	Phalacrocorax varius	Pied Cormorant				•					
Threskiornithidae	*Platalea flavipes*	Yellow-billed Spoonbill				•					•
	Platalea regia	Royal Spoonbill									•
	Plegadis falcinellus	Glossy Ibis	Mig. (EPBC & BC Acts)					•			
	Threskiornis moluccus	Australian White Ibis				•					
	Threskiornis spinicollis	Straw-necked Ibis				•					
Ardeidae	*Ardea ibis*	Cattle Egret				•					
	Ardea modesta	Great Egret				•					
	Ardea novaehollandiae	White-faced Heron				•					•
	Ardea pacifica	White-necked Heron				•					
	Ardea sacra	Eastern Reef Egret				•					

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
Pelecanidae	*Pelecanus conspicillatus*	Australian Pelican				•					
Accipitridae	*Accipiter cirrocephalus*	Collared Sparrowhawk				•					
	Accipiter fasciatus	Brown Goshawk				•			•		
	Aquila audax	Wedge-tailed Eagle				•	•				
	Circus approximans	Swamp Harrier				•					
	Circus assimilis	Spotted Harrier				•					
	Haliaeetus leucogaster	White-bellied Sea-Eagle				•					
	Haliastur sphenurus	Whistling Kite				•					
	Hieraaetus morphnoides	Little Eagle				•					
	Milvus migrans	Black Kite				•					
	Pandion cristatus	Osprey	Mig. (EPBC & BC Acts)		•	•		•			
Tytonidae	*Tyto alba*	Barn Owl					•				
Strigidae	*Ninox boobook*	Southern Boobook				•	•				
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra		*		•					•
	Todiramphus pyrrhopygius	Red-backed Kingfisher				•					
	Todiramphus sanctus	Sacred Kingfisher				•					
Meropidae	*Merops ornatus*	Rainbow Bee-eater				•			•		
Falconidae	*Falco berigora*	Brown Falcon				•	•				
	Falco cenchroides	Australian Kestrel				•	•		•	•	•

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
	Falco hypoleucos	Grey Falcon	VU (BC Act)		•						
	Falco longipennis	Australian Hobby				•					
	Falco peregrinus	Peregrine Falcon	OS (BC Act)			•		•			
Cacatuidae	*Cacatua pastinator*	Western Long-billed Corella				•					
	Cacatua roseicapilla	Galah				•	•		•	•	•
	Cacatua sanguinea	Little Corella				•				•	•
	Calyptorhynchus banksii	Red-tailed Black-Cockatoo				•					
	Nymphicus hollandicus	Cockatiel				•					
	Zanda latirostris	Carnaby's Black Cockatoo	EN (EPBC & BC Acts)		•	•	•	•	•		•
	Zanda sp.	White-tailed black cockatoo	EN/VU (EPBC & BC Acts)					•			
Psittaculidae	*Melopsittacus undulatus*	Budgerigar				•					
	Neophema bourkii	Bourke's Parrot				•					
	Neophema elegans	Elegant Parrot				•					
	Parvipsitta porphyrocephala	Purple-crowned Lorikeet				•					
	Platycercus icterotis	Western Rosella									•
	Platycercus varius	Mulga Parrot				•					
	Platycercus zonarius	Australian Ringneck				•	•			•	•
	Polytelis anthopeplus	Regent Parrot				•					
	Malurus lamberti	Variegated Fairy-wren				•	•		•		

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
Maluridae	*Malurus leucopterus*	White-winged Fairy-wren				•	•		•	•	
	Malurus pulcherrimus	Blue-breasted Fairy-wren				•					•
	Malurus splendens	Splendid Fairy-wren				•			•	•	•
	Stipiturus malachurus	Southern Emu-wren							•		
Meliphagidae	*Acanthagenys rufogularis*	Spiny-cheeked Honeyeater				•	•				
	Anthochaera carunculata	Red Wattlebird				•	•				•
	Anthochaera lunulata	Western Little Wattlebird				•					•
	Certhionyx variegatus	Pied Honeyeater				•					
	Epthianura albifrons	White-fronted Chat				•	•				
	Epthianura tricolor	Crimson Chat				•					
	Gavicalis virescens	Singing Honeyeater				•	•		•	•	•
	Glyciphila melanops	Tawny-crowned Honeyeater				•	•		•		
	Lichenostomus leucotis	White-eared Honeyeater				•					
	Lichmera indistincta	Brown Honeyeater				•	•		•	•	•
	Manorina flavigula	Yellow-throated Miner				•					•
	Melithreptus brevirostris	Brown-headed Honeyeater				•					
	Phylidonyris niger	White-cheeked Honeyeater				•	•		•		
	Phylidonyris novaehollandiae	New Holland Honeyeater							•		
	Ptilotula ornata	Yellow-plumed Honeyeater				•					

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
	Ptilotula penicillata	White-plumed Honeyeater				•					
	Ptilotula plumula	Grey-fronted Honeyeater				•					
	Purnella albifrons	White-fronted Honeyeater				•	•				
Pardalotidae	*Pardalotus striatus*	Striated Pardalote				•				•	•
Acanthizidae	*Acanthiza apicalis*	Broad-tailed Thornbill				•					
	Acanthiza chrysorrhoa	Yellow-rumped Thornbill				•				•	•
	Acanthiza robustirostris	Slaty-backed Thornbill				•					
	Acanthiza uropygialis	Chestnut-rumped Thornbill				•					
	Aphelocephala leucopsis	Southern Whiteface				•					
	Calamanthus campestris montanellus	Rufous Fieldwren				•					
	Gerygone fusca	Western Gerygone				•				•	•
	Hylacola cauta whitlocki						•				
	Pyrrholaemus brunneus	Redthroat				•					
	Sericornis frontalis	White-browed Scrubwren				•	•		•		•
	Smicrornis brevirostris	Weebill				•	•		•	•	•
Pomatostomidae	*Pomatostomus superciliosus*	White-browed Babbler				•					
Cinclosomatidae	*Psophodes occidentalis*	Western Wedgebill				•					
Artamidae	*Artamus cinereus*	Black-faced Woodswallow				•	•				
	Artamus personatus	Masked Woodswallow				•			•		

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
	Cracticus nigrogularis	Pied Butcherbird				•	•				•
	Cracticus tibicen	Australian Magpie				•	•		•	•	•
	Cracticus torquatus	Grey Butcherbird				•					•
	Strepera versicolor	Grey Currawong				•					
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike				•	•		•	•	•
	Lalage tricolor	White-winged Triller				•			•	•	
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella				•					
Pachycephalidae	*Colluricincla harmonica*	Grey Shrike-thrush				•				•	•
	Oreoica gutturalis	Crested Bellbird				•	•				
	Pachycephala occidentalis	Western Golden Whistler				•			•		
	Pachycephala rufiventris	Rufous Whistler				•	•		•	•	•
Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird				•				•	
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail				•			•	•	•
	Rhipidura leucophrys	Willie Wagtail				•	•		•		•
Monarchidae	*Grallina cyanoleuca*	Magpie-lark				•	•		•	•	•
	Myiagra inquieta	Restless Flycatcher									•
Corvidae	*Corvus bennetti*	Little Crow				•					
	Corvus coronoides	Australian Raven				•	•		•		•
	Corvus orru	Torresian Crow				•					
	Corvus sp.	Crow indet.								•	

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
Petroicidae	*Drymodes brunneopygia*	Southern Scrub-robin				•					
	Eopsaltria georgiana	White-breasted Robin				•					
	Melanodryas cucullata	Hooded Robin					•				
	Microeca fascinans	Jacky Winter				•					
	Petroica goodenovii	Red-capped Robin				•	•			•	•
Hirundinidae	*Cheramoeca leucosterna*	White-backed Swallow				•					
	Hirundo neoxena	Welcome Swallow				•	•				
	Petrochelidon ariel	Fairy Martin				•					
	Petrochelidon nigricans	Tree Martin				•	•		•	•	
Acrocephalidae	*Acrocephalus australis*	Australian Reed Warbler				•					•
Locustellidae	*Cincloramphus cruralis*	Brown Songlark				•	•			•	
	Cincloramphus mathewsi	Rufous Songlark				•					•
	Poodytes gramineus	Little Grassbird				•					
Zosteropidae	*Zosterops lateralis*	Grey-breasted White-eye				•	•		•		
Passeridae	*Passer montanus*	Eurasian Tree Sparrow		*	•						
Estrildidae	*Taeniopygia guttata*	Zebra Finch				•					
Motacillidae	*Anthus australis*	Australian Pipit				•	•		•	•	
	Motacilla alba	White Wagtail							•		
	Motacilla cinerea	Grey Wagtail	Mig. (EPBC & BC Acts)		•						

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
Mammals (27)											
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked Echidna					•		•	•	
Dasyuridae	*Dasyurus geoffroii*	Chuditch	VU (EPBC & BC Acts)		•	•		•			
	Parantechinus apicalis	Dibbler	EN (EPBC & BC Acts)		•						
	Phascogale tapoatafa wambenger	South-western Brush-tailed Phascogale	CD (BC Act)			•		•			
	Sminthopsis crassicaudata	Fat-tailed Dunnart				•					
Tarsipedidae	*Tarsipes rostratus*	Honey Possum				•					
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo				•	•		•		•
	Notamacropus irma	Western Brush Wallaby	P4 (DBCA list)			•		•			
	Osphranter rufus	Red Kangaroo								•	
Muridae	*Hydromys chrysogaster*	Water-rat	P4 (DBCA list)			•					
	Mus musculus	House Mouse		*	•	•					
	Notomys alexis	Spinifex Hopping-mouse				•					
	Pseudomys albocinereus	Ash-grey Mouse				•					
	Rattus fuscipes	Western Bush Rat				•					
	Rattus rattus	Black Rat		*	•						
Leporidae	*Oryctolagus cuniculus*	Rabbit		*	•		•		•	•	•
Pteropodidae	*Pteropus scapulatus*	Little Red Flying-fox				•					

Family	Species	Common name	Status	Introduced	Source						This survey
					EPBC Protected Matters	NatureMap	Phoenix database	DBCA Threatened and Priority fauna	Other reports	Phoenix 2022 survey	
Vespertilionidae	*Nyctophilus geoffroyi*	Lesser Long-eared Bat				•					
	Vespadelus regulus	Southern Forest Bat				•					
Canidae	*Canis familiaris*	Dog		*	•		•		•	•	•
	Vulpes vulpes	Red Fox		*	•		•		•	•	•
Felidae	*Felis catus*	Cat		*	•	•					
Equidae	*Equus caballus*	Horse		*		•					
Suidae	*Sus scrofa*	Pig		*	•				•		
Bovidae	*Bos taurus*	European Cattle		*	•		•			•	
	Capra hircus	Goat		*	•				•		
	Ovis aries	Sheep				•				•	

Appendix d Invertebrate fauna desktop and field survey results

Higher taxon, Family	Species	SRE category	Desktop (WAM 2023)	This survey
Class Arachnida, infraorder Mygalomorphae (trapdoor spiders)				
Anamidae	*Aname* `MYG633`	Potential	•	
Idiopidae	*Bungulla banksia*	Potential	•	
Idiopidae	*Bungulla bringo*	Potential	•	
Idiopidae	*Idiosoma* `BMYG188`	Potential	•	
Idiopidae	*Idiosoma* `BMYG189`	Potential	•	
Idiopidae	*Idiosoma* `MYG759`	Potential	•	
Idiopidae	*Idiosoma* `MYG761`	Potential	•	
Idiopidae	*Idiosoma kwongan*	Potential (P1)	•	
Idiopidae	*Idiosoma arenaceum*	Potential (P3)	•	
Anamidae	*Aname* `sp. indet.`	Uncertain	•	
Halonoproctidae	*Conothele* `sp. indet.`	Uncertain	•	
Idiopidae	*Euoplos* `sp. indet.`	Uncertain	•	
Idiopidae	*Idiosoma* `sp. indet.`	Uncertain	•	
Anamidae	*Kwonkan* `sp. indet.`	Uncertain	•	
Actinopodidae	*Missulena* `sp. indet.`	Uncertain	•	
Anamidae	*Proshermacha* `sp. indet.`	Uncertain	•	
Theraphosidae	*Selenocosmia* `sp. indet.`	Uncertain	•	
Anamidae	*Teyl* `sp. indet.`	Uncertain	•	
Class Arachnida, order Pseudoscorpiones				
Chthoniidae	*Austrochthonius* `PSE192, lesueuri`	Potential	•	
Cheliferidae	*Protochelifer* `sp. indet.`	Uncertain	•	
Class Arachnida, order Scorpiones				
Urodacidae	*Urodacus* `armatus spp. group`	Potential	•	
Urodacidae	*Urodacus* `BSCO071`	Potential	•	
Urodacidae	*Urodacus* `SCO016, Mingenew`	Potential	•	
Urodacidae	*Urodacus* `SCO019, Casuarinas`	Potential	•	
Bothriuridae	*Cercophonius* `sp. indet.`	Uncertain	•	
Buthidae	*Lychas* `sp. indet.`	Uncertain	•	
Urodacidae	*Urodacus* `sp. indet.`	Uncertain	•	
Class Crustacea, order Isopoda (isopods)				
Armadillidae	*Buddelundia* '88'	Potential	•	
Armadillidae	*Buddelundia callosa*	Potential	•	
Armadillidae	*Buddelundia lateralis*	Potential	•	
Armadillidae	*Buddelundia* 'Phoenix0150'	Potential		•
Armadillidae	*Buddelundia subinermis*	Potential	•	
Armadillidae	*Buddelundia* sp. indet.	Uncertain	•	
Platyarthridae	*Trichorhina* sp. indet.	Uncertain	•	
Philosciidae	*Laevophiloscia* '1'	Potential		•

Porcellionidae	*Porcellionides pruinosus*	Widespread		•
Class Diplopoda (millipedes)				
Paradoxosomatidae	*Antichiropus* `DIP072, casuarinae`	Confirmed	•	
Paradoxosomatidae	*Antichiropus* `DIP076`	Confirmed	•	
Paradoxosomatidae	*Antichiropus* `DIP078, Eneabba 1`	Confirmed	•	
Paradoxosomatidae	*Antichiropus* `DIP099, mcmillani`	Confirmed	•	
Paradoxosomatidae	*Antichiropus* `DIP136, mobilis`	Confirmed	•	
Paradoxosomatidae	*Antichiropus* "DIP232"	Likely		•
Paradoxosomatidae	*Antichiropus* `sp. indet.`	Uncertain	•	
Iulomorphidae	*Iulomorphidae* `sp. indet.`	Uncertain	•	
Class Gastropoda (land snails)				
Bothriembryontidae	*Bothriembryon whitleyi*	Confirmed	•	
Bothriembryontidae	*Bothriembryon perobesus*	Potential (P1)	•	
Camaenidae	*Basedowena bethana*	Potential	•	
Bothriembryontidae	*Bothriembryon* `sp. indet.`	Uncertain	•	
Camaenidae	*Basedowena* `sp. indet.`	Uncertain	•	

Appendix e Fauna species by site matrix

Order	Family	Scientific name	Common name	L001	L002	L003	L003-SRE	L004	L005	L006	L007	L008	L009	L010	L012	L013	L014
Amphibians (1)																	
Anura	Limnodynastidae	*Limnodynastes dorsalis*	Western Banjo Frog							1							
Reptiles (5)																	
Squamata	Gekkonidae	*Gehyra variegata*	Variegated Dtella		1												
Squamata	Agamidae	*Ctenophorus nuchalis*	Central Netted dragon								3						
Squamata	Scincidae	*Cryptoblepharus plagiocephalus*	Péron's snake-eyed skink										1				
Squamata	Scincidae	*Tiliqua rugosa*	Bobtail										1				
Squamata	Typhlopidae	*Anilios australis*	Southern Blindsnake			1											
Birds (40)																	
Ciconiiformes	Ardeidae	*Ardea novaehollandiae*	White-faced Heron												3		1
Ciconiiformes	Threskiornithidae	*Platalea flavipes*	Yellow-billed Spoonbill														3
Ciconiiformes	Threskiornithidae	*Platalea regia*	Royal Spoonbill														3
Columbiformes	Columbidae	*Ocyphaps lophotes*	Crested Pigeon	1	1								1	1			
Columbiformes	Columbidae	*Streptopelia senegalensis*	Laughing Dove			3											
Coraciiformes	Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra				1										
Cuculiformes	Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo			1											
Cuculiformes	Cuculidae	*Chrysococcyx lucidus*	Shining Bronze Cuckoo			1											
Falconiformes	Falconidae	*Falco cenchroides*	Australian Kestrel					1					1		1		
Gruiformes	Rallidae	*Gallirallus philippensis*	Buff-banded Rail							1							
Passeriformes	Acanthizidae	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	2			1						1				
Passeriformes	Acanthizidae	*Gerygone fusca*	Western Gerygone		1	1	1	1					1	1		1	1
Passeriformes	Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren							2							

Order	Family	Scientific name	Common name	L001	L002	L003	L003-SRE	L004	L005	L006	L007	L008	L009	L010	L012	L013	L014
Passeriformes	Acanthizidae	*Smicrornis brevirostris*	Weebill		1		1			1				1			1
Passeriformes	Acrocephalidae	*Acrocephalus australis*	Australian Reed Warbler							1							
Passeriformes	Artamidae	*Cracticus nigrogularis*	Pied Butcherbird			1											
Passeriformes	Artamidae	*Cracticus torquatus*	Grey Butcherbird										1				
Passeriformes	Artamidae	*Gymnorhina tibicen*	Australian Magpie				1				2	1	2				
Passeriformes	Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike										1		1		1
Passeriformes	Corvidae	*Corvus coronoides*	Australian Raven			1	1	3		1	1			1		1	1
Passeriformes	Locustellidae	*Cincloramphus mathewsi*	Rufous Songlark	1	1	1				1	2			1			
Passeriformes	Maluridae	*Malurus pulcherrimus*	Blue-breasted Fairy-wren					6							2		
Passeriformes	Maluridae	*Malurus splendens*	Splendid Fairy-wren	1	1	1		2		1		5	1		1		
Passeriformes	Meliphagidae	*Anthochaera carunculata*	Red Wattlebird			2	1				4			1			
Passeriformes	Meliphagidae	*Anthochaera lunulata*	Western Little Wattlebird			1											
Passeriformes	Meliphagidae	*Gavicalis virescens*	Singing Honeyeater			1											
Passeriformes	Meliphagidae	*Lichmera indistincta*	Brown Honeyeater			1	1			1			1	1		1	
Passeriformes	Meliphagidae	*Manorina flavigula*	Yellow-throated Miner		1						1		1				
Passeriformes	Monarchidae	*Grallina cyanoleuca*	Magpie-lark			1	1			1	1			1			1
Passeriformes	Monarchidae	*Myiagra inquieta*	Restless Flycatcher			1											
Passeriformes	Pachycephalidae	*Colluricincla harmonica*	Grey Shrike-thrush			1	1				1						
Passeriformes	Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler		1	1		1		1			1	1	1	1	
Passeriformes	Pardalotidae	*Pardalotus striatus*	Striated Pardalote		1	1			1	1					1	1	1
Passeriformes	Petroicidae	*Petroica goodenovii*	Red-capped Robin			1	1						1	1			1
Passeriformes	Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail			1			1	1					1	1	1
Passeriformes	Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail					1		1				1			1

Order	Family	Scientific name	Common name	L001	L002	L003	L003-SRE	L004	L005	L006	L007	L008	L009	L010	L012	L013	L014
Psittaciformes	Cacatuidae	*Cacatua roseicapilla*	Galah			5	1	5		1	1		6				2
Psittaciformes	Cacatuidae	*Cacatua sanguinea*	Little Corella			1				1				1		1	2
Psittaciformes	Cacatuidae	*Zanda latirostris*	Carnaby's Black Cockatoo								1						
Psittaciformes	Psittaculidae	*Platycercus icterotis*	Western Rosella			1											
Psittaciformes	Psittaculidae	*Platycercus zonarius*	Australian Ringneck	1	4	1	2	5		1	1			1		3	
Mammals (4)																	
Carnivora	Canidae	*Canis familiaris*	Dog					1									
Carnivora	Canidae	*Vulpes vulpes*	Red Fox											1			
Diprotodontia	Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo	1	3	1		1	1		1	1					
Lagomorpha	Leporidae	*Oryctolagus cuniculus*	Rabbit	1	1							1					

Appendix f Potential habitat trees

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-001	-29.20881	115.24314	L004	410	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-002	-29.20851	115.23730	L004	430	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-003	-29.20856	115.23691	L004	440	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-004	-29.20860	115.23665	L004	450	*Eucalyptus sp.*	KF	1	10m	No	No	No		DBH between 300-500 mm so may develop hollows in the future.
1601-005	**-29.20865**	**115.23640**	**L004**	**730**	***Eucalyptus sp.***	**KF**	**1**	**8m**	**No**	**No**	**No**		
1601-006	-29.20870	115.23606	L004	310	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-007	**-29.20866**	**115.23602**	**L004**	**620**	***Eucalyptus sp.***	**KF**	**0**						
1601-008	**-29.20869**	**115.23572**	**L004**	**540**	***Eucalyptus sp.***	**KF**	**0**						
1601-009	-29.20874	115.23557	L004	300	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-010	**-29.20875**	**115.23542**	**L004**	**710**	***Eucalyptus sp.***	**KF**	**0**						
1601-011	**-29.20877**	**115.23513**	**L004**	**620**	***Eucalyptus sp.***	**KF**	**0**						
1601-012	**-29.20882**	**115.23450**	**L004**	**520**	***Eucalyptus sp.***	**KF**	**0**						
1601-013	**-29.20890**	**115.23419**	**L004**	**680**	***Eucalyptus sp.***	**KF**	**0**						
1601-014	**-29.20889**	**115.23390**	**L004**	**680**	***Eucalyptus sp.***	**KF**	**0**						**Dead tree**
1601-015	**-29.20914**	**115.23392**	**L004**	**890**	***Eucalyptus sp.***	**KF**	**1**	**12m**	**No**	**No**	**No**		
1601-016	-29.20910	115.23440	L004	350	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-017	-29.20908	115.23455	L004	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-018	-29.20908	115.23459	L004	310	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-019	-29.20903	115.23490	L004	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-020	-29.20900	115.23501	L004	310	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.

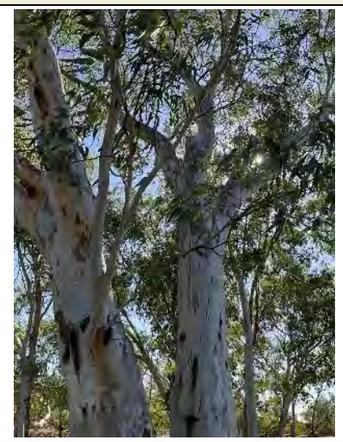
sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-021	-29.20900	115.23516	L004	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-022	**-29.20896**	**115.23517**	**L004**	**590**	***Eucalyptus sp.***	**KF**	**1**	**5m**	**No**	**No**	**No**		
1601-023	**-29.20896**	**115.23515**	**L004**	**900**	***Eucalyptus sp.***	**KF**	**1**	**10m**	**No**	**No**	**No**		
1601-024	**-29.20890**	**115.23596**	**L004**	**600**	***Eucalyptus sp.***	**KF**	**1**	**4m**	**No**	**No**	**No**		
1601-025	-29.20887	115.23623	L004	350	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-026	**-29.20888**	**115.23671**	**L004**	**780**	***Eucalyptus sp.***	**KF**	**1**	**6m**	**No**	**No**	**No**		
1601-027	**-29.20889**	**115.23697**	**L004**	**910**	***Eucalyptus sp.***	**KF**	**1**	**10m**	**No**	**No**	**No**		
1601-028	**-29.20881**	**115.23724**	**L004**	**1000**	***Eucalyptus sp.***	**KF**	**1**	**8m,10m**	**No**	**No**	**No**		
1601-029	**-29.20881**	**115.23757**	**L004**	**500**	***Eucalyptus sp.***	**KF**	**0**						
1601-030	**-29.20924**	**115.23323**	**L004**	**740**	***Eucalyptus sp.***	**KF**	**0**						
1601-031	**-29.20927**	**115.23309**	**L004**	**720**	***Eucalyptus sp.***	**KF**	**0**						
1601-032	**-29.20936**	**115.23236**	**L004**	**1270**	***Eucalyptus sp.***	**KF**	**1**	**1m**	**No**	**No**	**No**		
1601-033	-29.20934	115.23223	L004	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-034	-29.20929	115.23223	L004	360	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-035	-29.20928	115.23223	L004	510	*Eucalyptus sp.*	KF	1	8m	No	No	No		
1601-036	-29.20940	115.23170	L004	710	*Eucalyptus sp.*	KF	1	7m	No	No	No		
1601-037	-29.20953	115.23034	L004	610	*Eucalyptus sp.*	KF	3	2m,6m,7m	No	No	No		
1601-038	-29.20964	115.22972	L004	850	*Eucalyptus sp.*	KF	3	2m,8m,10m	No	No	No		
1601-039	-29.20971	115.22856	L004	1130	*Eucalyptus sp.*	KF	3	3m,5m,6m	No	No	No		
1601-040	-29.20977	115.22802	L004	860	*Eucalyptus sp.*	KF	3	3m,5m,7m	No	No	No		
1601-041	-29.20986	115.22739	L004	520	*Eucalyptus sp.*	KF	0						
1601-042	-29.20995	115.22686	L004	1600	*Eucalyptus sp.*	KF	1	8m	No	No	No		
1601-043	-29.20989	115.22680	L004	400	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-044	-29.20995	115.22680	L004	400	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-045	-29.20997	115.22632	L004	750	*Eucalyptus sp.*	KF	1	12m	No	No	No		
1601-046	-29.21004	115.22576	L004	600	*Eucalyptus sp.*	KF	0						
1601-055	-29.20900	115.23313	L004	360	*Eucalyptus sp.*	KF	0						
1601-056	-29.20895	115.23319	L004	630	*Eucalyptus sp.*	KF	0						
1601-057	-29.20893	115.23356	L004	410	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop hollows in the future.
1601-058	-29.20889	115.23367	L004	720	*Eucalyptus sp.*	KF	0						

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-063	-29.20851	115.23840	L004	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop hollows in the future.
1601-064	-29.20656	115.23782	L004	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop hollows in the future.
1601-065	-29.20558	115.23777	L004	330	*Eucalyptus sp.*	JS	0						2 trunks, one thinner DBH between 300-500 mm so may develop hollows in the future.
1601-066	-29.20522	115.23780	L004	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-067	-29.20849	115.23732	L004	500	*Eucalyptus sp.*	JS	0						
1601-068	-29.20854	115.23698	L004	500	*Eucalyptus sp.*	JS	0						
1601-074	-29.20879	115.23788	L004	700	*Eucalyptus sp.*	JS	0						

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-088	-29.20980	115.22547	L004	750	*Eucalyptus sp.*	JS	0						
1601-089	-29.20978	115.22555	L004	800	*Eucalyptus sp.*	JS	0						
1601-090	-29.20978	115.22563	L004	600	*Eucalyptus sp.*	JS	0						
1601-091	-29.20975	115.22571	L004	650	*Eucalyptus sp.*	JS	0						
1601-092	-29.20974	115.22579	L004	550	*Eucalyptus sp.*	JS	0						
1601-093	-29.20972	115.22593	L004	550	*Eucalyptus sp.*	JS	0						
1601-094	-29.20970	115.22620	L004	800	*Eucalyptus sp.*	JS	0						
1601-095	-29.20970	115.22626	L004	800	*Eucalyptus sp.*	JS	0						
1601-096	-29.20962	115.22676	L004	600	*Eucalyptus sp.*	JS	0						
1601-097	-29.20964	115.22682	L004	900	*Eucalyptus sp.*	JS	0						
1601-098	-29.20964	115.22688	L004	450	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop hollows in the future.
1601-099	-29.20957	115.22741	L004	650	*Eucalyptus sp.*	JS	0						
1601-100	-29.20955	115.22764	L004	800	*Eucalyptus sp.*	JS	0						
1601-101	-29.20951	115.22805	L004	650	*Eucalyptus sp.*	JS	0						
1601-102	-29.20949	115.22812	L004	700	*Eucalyptus sp.*	JS	0						
1601-103	-29.20947	115.22851	L004	800	*Eucalyptus sp.*	JS	0						
1601-104	-29.20946	115.22861	L004	550	*Eucalyptus sp.*	JS	0						

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-105	-29.20941	115.22906	L004	750	*Eucalyptus sp.*	JS	0						Wide, low-forking tree
1601-106	-29.20921	115.23087	L004	700	*Eucalyptus sp.*	JS	0						
1601-107	-29.20903	115.23231	L004	850	*Eucalyptus sp.*	JS	0						
1601-108	-29.20902	115.23275	L004	900	*Eucalyptus sp.*	JS	0						
1601-109	-29.20868	115.24541	L003	410	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-110	-29.20869	115.24507	L003	420	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-111	-29.20891	115.24486	L003	410	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-112	-29.20893	115.24452	L003	460	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-113	-29.20897	115.24428	L003	380	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-114	-29.20890	115.24410	L003	520	*Eucalyptus sp.*	KF	0						
1601-115	-29.20897	115.24405	L003	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-116	-29.20899	115.24439	L003	340	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-117	-29.20900	115.24456	L003	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-118	-29.20900	115.24500	L003	440	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-119	-29.20911	115.24540	L003	1130	*Eucalyptus sp.*	KF	0						Possible future hollow
1601-120	-29.20907	115.24572	L003	410	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-121	-29.20908	115.24588	L003	460	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-122	-29.20910	115.24625	L003	310	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-131	-29.20911	115.25493	L003	800	*Eucalyptus sp.*	JS	2	4m,7m	No	No	No		Dead Euc, trunk and side branches sawn to expose hollows, most too small for BC but one marginal. No signs of use.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-132	-29.20933	115.25216	L003	300	*Eucalyptus sp.*	JS	0						Forks in 3 just above ground, each approx 300 . Some upper branches dying off, but currently contains no hollows. DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-133	-29.20933	115.25237	L003	400	*Eucalyptus sp.*	JS	0						Forks in >3 at base, developing low hollows where lopped on side toward railway. DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-134	-29.20933	115.25240	L003	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-135	-29.20961	115.25341	L003	1100	*Eucalyptus sp.*	JS	1	6 m	Yes	No	Yes		Massive gnarly trunk, currently multiple small hollows in dead or sawn branches, potential for large hollows. Ringnecks in hollow.
1601-136	-29.20893	115.24620	L003	450	*Eucalyptus sp.*	JS	0						Splits in 3 ~1 m above ground, no major branches dead or lopped. Thickest trunk away from rail line, all 3 over 350 mm. DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-137	-29.20904	115.24594	L003	500	*Eucalyptus sp.*	JS	1	5 m	No	No	No		Main trunk leans, hollow with future BC potential where branch missing

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-138	-29.20892	115.24500	L003	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-139	-29.20895	115.24491	L003	600	*Eucalyptus sp.*	JS	0						North bank of mine drainage between road and rail
1601-140	-29.20896	115.24460	L003	300	*Eucalyptus sp.*	JS	0						Some dead branches may produce small hollows, currently not near size suitable for BC. DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-142	-29.20924	115.24563	L003	650	*Eucalyptus sp.*	JS	0						Big tree, some branches broken off but fully healed over, not making hollows.
1601-144	-29.20965	115.25023	L003	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-145	-29.20980	115.25203	L003	600	*Eucalyptus sp.*	JS	0						Large branch sawn off, healing over without forming hollow

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-146	-29.20981	115.25299	L003	450	*Eucalyptus sp.*	JS	0						Healing over sawn branch stumps. DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-147	-29.20981	115.25310	L003	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-148	-29.21778	115.27487	L010	300	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-149	-29.21766	115.27575	L010	420	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-150	-29.21745	115.28055	L010	320	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-151	-29.21744	115.28044	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-152	-29.21740	115.28039	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-153	-29.21740	115.28035	L010	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

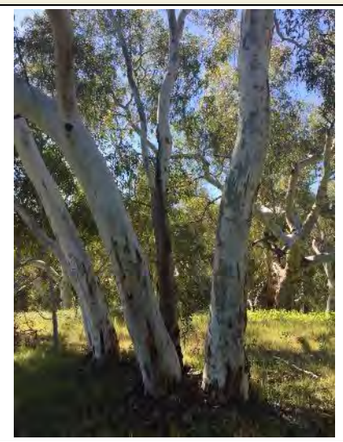
sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-154	-29.21742	115.28012	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-155	-29.21739	115.27986	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-156	-29.21738	115.27970	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-157	-29.21737	115.27962	L010	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-158	-29.21737	115.27927	L010	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-159	-29.21735	115.27920	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-160	-29.21734	115.27883	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-161	-29.21731	115.27864	L010	320	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-162	-29.21731	115.27832	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-163	-29.21729	115.27767	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-164	-29.21730	115.27762	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-165	-29.21729	115.27756	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-166	-29.21731	115.27748	L010	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-167	-29.21733	115.27731	L010	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-168	-29.21743	115.27682	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-169	-29.21745	115.27670	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

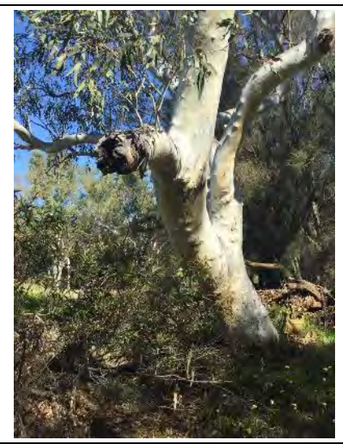
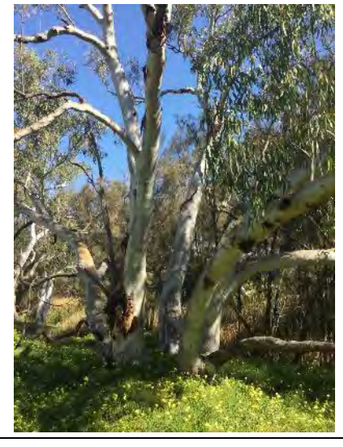
sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-170	-29.21748	115.27658	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-171	-29.21755	115.27629	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-172	-29.21757	115.27624	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-173	-29.21762	115.27591	L010	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-174	-29.21739	115.28089	L012	400	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-175	-29.21718	115.28091	L012	430	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-176	-29.21697	115.28089	L012	380	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-177	-29.21658	115.28082	L012	660	*Eucalyptus sp.*	KF	0						Dead
1601-178	-29.21643	115.28085	L012	510	*Eucalyptus sp.*	KF	0						
1601-179	-29.21627	115.28089	L012	300	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-180	-29.21616	115.28089	L012	300	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-181	-29.21611	115.28088	L012	400	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-182	-29.21604	115.28087	L012	570	*Eucalyptus sp.*	KF	0						
1601-183	-29.21588	115.28090	L012	330	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-184	-29.21574	115.28086	L012	560	*Eucalyptus sp.*	KF	0						
1601-185	-29.21573	115.28086	L012	430	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-186	-29.21570	115.28089	L012	460	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-187	-29.21575	115.28088	L012	380	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-188	-29.21469	115.28085	L012	360	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-189	-29.21462	115.28085	L012	300	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-190	-29.21449	115.28086	L012	890	*Eucalyptus sp.*	KF	0						
1601-191	-29.21392	115.28139	L012	850	*Eucalyptus sp.*	KF	0						
1601-192	-29.21389	115.28142	L012	530	*Eucalyptus sp.*	KF	0						
1601-193	-29.21177	115.28276	L012	600	*Eucalyptus sp.*	JS	0						
1601-194	-29.21185	115.28274	L012	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-195	-29.21190	115.28268	L012	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-196	-29.21195	115.28266	L012	550	*Eucalyptus sp.*	JS	0						
1601-197	-29.21203	115.28261	L012	550	*Eucalyptus sp.*	JS	0						
1601-198	-29.21220	115.28248	L012	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-199	-29.21223	115.28248	L012	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-200	-29.21229	115.28243	L012	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-201	-29.21241	115.28233	L012	750	*Eucalyptus sp.*	JS	0						
1601-202	-29.21259	115.28224	L012	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-203	-29.21266	115.28221	L012	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-204	-29.21275	115.28214	L012	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-205	-29.21278	115.28213	L012	450	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-206	-29.21279	115.28211	L012	320	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-207	-29.21286	115.28206	L012	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-208	-29.21296	115.28199	L012	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-209	-29.21309	115.28196	L012	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-210	-29.21312	115.28192	L012	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-211	-29.21319	115.28190	L012	500	*Eucalyptus sp.*	JS	0						
1601-212	-29.21329	115.28181	L012	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-213	-29.21340	115.28173	L012	320	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-214	-29.21345	115.28172	L012	430	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-215	-29.21354	115.28167	L012	320	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-216	-29.21355	115.28163	L012	450	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-217	-29.21359	115.28163	L012	380	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-218	-29.21366	115.28158	L012	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-219	-29.21374	115.28153	L012	440	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-220	-29.21380	115.28150	L012	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-221	-29.21383	115.28146	L012	430	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-222	-29.21103	115.28258	L006	730	*Eucalyptus sp.*	KF	0						
1601-223	-29.21103	115.28266	L006	510	*Eucalyptus sp.*	KF	0						
1601-224	-29.21104	115.28266	L006	410	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-225	-29.21111	115.28271	L006	430	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-226	-29.21114	115.28269	L006	500	*Eucalyptus sp.*	KF	0						
1601-227	-29.21116	115.28262	L006	520	*Eucalyptus sp.*	KF	0						
1601-228	-29.21128	115.28280	L006	620	*Eucalyptus sp.*	KF	1	6m	No	No	No		
1601-229	-29.21128	115.28286	L006	510	*Eucalyptus sp.*	KF	0						
1601-230	-29.21127	115.28291	L006	540	*Eucalyptus sp.*	KF	0						
1601-231	-29.21125	115.28295	L006	450	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-232	-29.21092	115.28246	L006	560	*Eucalyptus sp.*	KF	0						
1601-233	-29.21072	115.28236	L006	560	*Eucalyptus sp.*	KF	0						
1601-234	-29.21056	115.28285	L006	480	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-235	-29.21064	115.28302	L006	580	*Eucalyptus sp.*	KF	0						
1601-236	-29.21076	115.28315	L006	530	*Eucalyptus sp.*	KF	1	7m	No	No	No		
1601-237	-29.21079	115.28302	L006	460	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-238	-29.21093	115.28293	L006	310	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-239	-29.21098	115.28285	L006	520	*Eucalyptus sp.*	KF	1	6m	No	No	No		
1601-240	-29.21086	115.28260	L006	420	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-241	-29.21062	115.28254	L006	490	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-242	-29.20991	115.28252	L006	469	*Eucalyptus sp.*	KF	1	8m	No	No	No		Currently contains bees. DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-243	-29.21139	115.28270	L006	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-244	-29.21138	115.28270	L006	320	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-245	-29.21135	115.28266	L006	430	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-246	-29.21113	115.28252	L006	360	*Eucalyptus sp.*	JS	0						Cluster of trunks from vanished stump, 2 >300 mm. DBH between 300-500 mm so may develop suitable size hollows in the future.

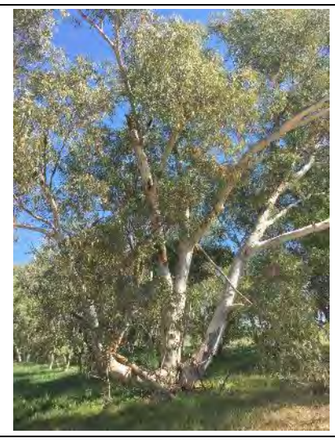
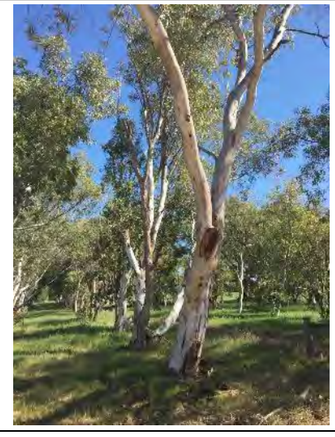
sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-247	-29.21114	115.28264	L006	700	*Eucalyptus sp.*	JS	0						Big tree leans toward river, some dead branches may produce hollow spouts. 2 smaller trunks lean away, may sprout from vanished stump of same
1601-248	-29.21062	115.28261	L006	650	*Eucalyptus sp.*	JS	1	3 m	No	No	No		Multiple trunks from below ground level, smallest 350. Some dead upper branches, hollow (10 cm) in lateral spout
1601-249	-29.21043	115.28250	L006	450	*Eucalyptus sp.*	JS	0						5 trunks from ground level, all >300. DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-250	-29.21026	115.28257	L006	400	*Eucalyptus sp.*	JS	0						Multiple splayed trunks from just above ground. DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-251	-29.21002	115.28251	L006	450	*Eucalyptus sp.*	JS	0						Multiple trunks from ground. DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-252	-29.21158	115.28285	L006	380	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-253	-29.21169	115.28280	L006	300	*Eucalyptus sp.*	JS	0						3 trunks each 300 mm. DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-254	-29.21172	115.28280	L006	480	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-255	-29.22551	115.27325	L002	610	*Eucalyptus sp.*	JS	0						
1601-256	-29.22522	115.27304	L002	800	*Eucalyptus sp.*	JS	0						Large multi-trunk Euc with broken off branches not (yet) forming hollow spouts. Hollow in base appeared to be used by fox, bones collected (rabbit).
1601-257	-29.19252	115.25026	L005	370	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-258	-29.19260	115.25097	L005	310	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-259	-29.19282	115.25085	L005	420	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-260	-29.19293	115.25110	L005	720	*Eucalyptus sp.*	KF	0						
1601-261	-29.19272	115.25120	L005	580	*Eucalyptus sp.*	KF	0						
1601-262	-29.19250	115.25223	L005	400	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-263	-29.19248	115.25202	L005	560	*Eucalyptus sp.*	KF	0						
1601-264	-29.19304	115.25149	L005	550	*Eucalyptus sp.*	KF	0						

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-265	-29.19307	115.25153	L005	480	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-266	-29.19312	115.25175	L005	750	*Eucalyptus sp.*	KF	0						
1601-267	-29.19280	115.25196	L005	340	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-268	-29.19248	115.25252	L005	340	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-269	-29.19260	115.25261	L005	510	*Eucalyptus sp.*	KF	0						
1601-270	-29.19250	115.25273	L005	520	*Eucalyptus sp.*	KF	0						
1601-271	-29.19255	115.25274	L005	480	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-272	-29.19315	115.25231	L005	310	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-273	-29.19336	115.25231	L005	500	*Eucalyptus sp.*	KF	0						
1601-274	-29.19339	115.25241	L005	540	*Eucalyptus sp.*	KF	0						
1601-275	-29.19339	115.25239	L005	640	*Eucalyptus sp.*	KF	0						
1601-276	-29.19344	115.25286	L005	620	*Eucalyptus sp.*	KF	0						
1601-277	-29.19341	115.25292	L005	520	*Eucalyptus sp.*	KF	0						
1601-278	-29.19352	115.25287	L005	360	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-279	-29.19355	115.25293	L005	480	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-280	-29.19356	115.25293	L005	340	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-281	-29.19351	115.25294	L005	410	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-282	-29.19349	115.25300	L005	340	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-283	-29.19354	115.25302	L005	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-284	-29.19345	115.25312	L005	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-285	-29.19319	115.25394	L005	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-286	-29.19247	115.25456	L005	520	*Eucalyptus sp.*	KF	0						
1601-287	-29.19248	115.25452	L005	420	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-288	-29.19249	115.25450	L005	440	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-289	-29.19248	115.25453	L005	340	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-290	-29.19257	115.25419	L005	430	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-291	-29.19252	115.25394	L005	530	*Eucalyptus sp.*	KF	0						
1601-292	-29.19252	115.25392	L005	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-293	-29.19251	115.25389	L005	350	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-294	-29.19251	115.25381	L005	540	*Eucalyptus sp.*	KF	0						
1601-295	-29.19250	115.25382	L005	920	*Eucalyptus sp.*	KF	0						
1601-296	-29.19250	115.25381	L005	430	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-297	-29.19250	115.25381	L005	650	*Eucalyptus sp.*	KF	0						
1601-298	-29.19254	115.25373	L005	570	*Eucalyptus sp.*	KF	0						
1601-299	-29.19228	115.25410	L005	1840	*Eucalyptus sp.*	KF	0						
1601-300	-29.19233	115.25413	L005	300	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-301	-29.19243	115.25404	L005	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-302	-29.19238	115.25409	L005	310	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-303	-29.19227	115.25418	L005	690	*Eucalyptus sp.*	KF	0						
1601-304	-29.19223	115.25425	L005	500	*Eucalyptus sp.*	KF	0						

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-306	-29.19224	115.25457	L005	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-307	-29.19234	115.25455	L005	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-308	-29.19241	115.25456	L005	550	*Eucalyptus sp.*	JS	0						Broken top, may develop hollow but probs not big enough for BC
1601-309	-29.19251	115.25461	L005	550	*Eucalyptus sp.*	JS	0						

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-310	-29.19290	115.25460	L005	550	*Eucalyptus sp.*	JS	0						
1601-311	-29.19320	115.25455	L005	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-312	-29.19344	115.25459	L005	450	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-313	-29.19451	115.25455	L005	350	*Eucalyptus sp.*	JS	0						4 trunks over 300, south corner of plantation. DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-314	-29.19434	115.25419	L005	430	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-315	-29.19430	115.25413	L005	430	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-316	-29.19422	115.25400	L005	350	*Eucalyptus sp.*	JS	0						3 trunks >300. DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-317	-29.19415	115.25399	L005	600	*Eucalyptus sp.*	JS	0						Dead branches may produce hollows
1601-318	-29.19421	115.25392	L005	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-319	-29.19406	115.25364	L005	650	*Eucalyptus sp.*	JS	0						2 big trunks, some broken branches

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-320	-29.19392	115.25354	L005	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-321	-29.19392	115.25339	L005	450	*Eucalyptus sp.*	JS	0						Low fork, both >400 mm. DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-322	-29.19388	115.25328	L005	450	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-323	-29.19378	115.25324	L005	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-324	-29.19374	115.25302	L005	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-325	-29.19368	115.25284	L005	500	*Eucalyptus sp.*	JS	0						
1601-326	-29.19351	115.25314	L005	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-327	-29.19351	115.25312	L005	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-328	-29.19365	115.25366	L005	440	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-329	-29.19356	115.25401	L005	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-330	-29.19364	115.25439	L005	450	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-331	-29.19349	115.25399	L005	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-332	-29.19326	115.25386	L005	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-333	-29.19319	115.25396	L005	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-334	-29.19223	115.25452	L005	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-335	-29.19221	115.25437	L005	350	*Eucalyptus sp.*	JS	0						Dead branches may form decent hollows, but less than 3 m up
1601-336	-29.19226	115.25430	L005	500	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-337	-29.18518	115.24488	L009	420	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-338	-29.18519	115.24489	L009	410	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-339	-29.18535	115.24469	L009	560	*Eucalyptus sp.*	KF	0						
1601-340	-29.18542	115.24466	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-341	-29.18548	115.24466	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-342	-29.18553	115.24467	L009	510	*Eucalyptus sp.*	KF	0						
1601-343	-29.18568	115.24479	L009	410	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-344	-29.18571	115.24481	L009	510	*Eucalyptus sp.*	KF	0						
1601-345	-29.18573	115.24483	L009	700	*Eucalyptus sp.*	KF	0						
1601-346	-29.18581	115.24485	L009	590	*Eucalyptus sp.*	KF	1	4m	No	No	No		
1601-347	-29.18583	115.24486	L009	570	*Eucalyptus sp.*	KF	0						
1601-348	-29.18599	115.24506	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-349	-29.18601	115.24508	L009	350	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-350	-29.18619	115.24527	L009	480	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-351	-29.18634	115.24533	L009	500	*Eucalyptus sp.*	KF	0						
1601-352	-29.18642	115.24541	L009	360	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-353	-29.18645	115.24547	L009	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-354	-29.18654	115.24557	L009	380	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-355	-29.18657	115.24558	L009	380	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-356	-29.18663	115.24563	L009	370	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-357	-29.18701	115.24572	L009	820	*Eucalyptus sp.*	KF	0						
1601-358	-29.18712	115.24563	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-359	-29.18715	115.24561	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-360	-29.18722	115.24557	L009	670	*Eucalyptus sp.*	KF	0						
1601-361	-29.18736	115.24549	L009	620	*Eucalyptus sp.*	KF	0						
1601-362	-29.18744	115.24543	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-363	-29.18774	115.24523	L009	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-364	-29.18782	115.24515	L009	550	*Eucalyptus sp.*	KF	0						
1601-365	-29.18796	115.24503	L009	560	*Eucalyptus sp.*	KF	0						
1601-366	-29.18815	115.24495	L009	560	*Eucalyptus sp.*	KF	0						
1601-367	-29.18817	115.24492	L009	860	*Eucalyptus sp.*	KF	0						
1601-368	-29.18830	115.24481	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-369	-29.18835	115.24479	L009	360	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-370	-29.18837	115.24479	L009	380	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-371	-29.18842	115.24477	L009	500	*Eucalyptus sp.*	KF	0						
1601-372	-29.18845	115.24473	L009	740	*Eucalyptus sp.*	KF	0						
1601-373	-29.18858	115.24467	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-374	-29.18859	115.24463	L009	310	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-375	-29.18861	115.24462	L009	360	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-376	-29.18866	115.24460	L009	400	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-377	-29.18880	115.24454	L009	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-378	-29.18881	115.24454	L009	600	*Eucalyptus sp.*	KF	0						
1601-379	-29.18885	115.24446	L009	660	*Eucalyptus sp.*	KF	0						
1601-380	-29.18889	115.24435	L009	360	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-381	-29.18889	115.24435	L009	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-382	-29.18896	115.24427	L009	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-383	-29.18898	115.24425	L009	310	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-384	-29.18912	115.24408	L009	350	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-385	-29.18914	115.24406	L009	380	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-386	-29.18921	115.24397	L009	470	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-387	-29.18925	115.24388	L009	360	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-388	-29.18935	115.24376	L009	370	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-389	-29.18942	115.24365	L009	660	*Eucalyptus sp.*	KF	0						
1601-390	-29.18948	115.24358	L009	400	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-391	-29.18956	115.24347	L009	300	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-392	-29.18958	115.24346	L009	430	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-393	-29.18966	115.24336	L009	450	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-394	-29.18973	115.24327	L009	440	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-395	-29.18981	115.24318	L009	550	*Eucalyptus sp.*	KF	0						
1601-396	-29.18983	115.24316	L009	480	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-397	-29.18988	115.24308	L009	570	*Eucalyptus sp.*	KF	0						
1601-398	-29.18989	115.24306	L009	330	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-399	-29.18995	115.24300	L009	590	*Eucalyptus sp.*	KF	0						
1601-400	-29.18997	115.24297	L009	880	*Eucalyptus sp.*	KF	0						
1601-401	-29.19005	115.24290	L009	340	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-402	-29.19012	115.24280	L009	610	*Eucalyptus sp.*	KF	0						
1601-403	-29.19036	115.24252	L009	690	*Eucalyptus sp.*	KF	0						
1601-404	-29.19038	115.24250	L009	430	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-405	-29.19043	115.24240	L009	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-406	-29.19044	115.24238	L009	640	*Eucalyptus sp.*	KF	0						
1601-407	-29.19049	115.24230	L009	480	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-408	-29.19049	115.24230	L009	380	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-409	-29.19050	115.24229	L009	620	*Eucalyptus sp.*	KF	0						
1601-410	-29.19078	115.24201	L009	690	*Eucalyptus sp.*	KF	1		No	No	No		
1601-411	-29.19078	115.24200	L009	370	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-412	-29.19114	115.24161	L009	310	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

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1601-413	-29.19184	115.24140	L009	300	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-414	-29.19232	115.24220	L009	650	*Eucalyptus sp.*	KF	0						
1601-415	-29.19229	115.24214	L009	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-416	-29.19229	115.24214	L009	710	*Eucalyptus sp.*	KF	0						
1601-417	-29.19229	115.24214	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-418	-29.19227	115.24385	L009	310	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-419	-29.19229	115.24399	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-420	-29.19223	115.24404	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-421	-29.19221	115.24431	L009	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-422	-29.19222	115.24440	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-423	-29.19222	115.24440	L009	400	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-424	-29.19222	115.24459	L009	770	*Eucalyptus sp.*	KF	0						
1601-425	-29.19225	115.24466	L009	340	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-426	-29.19244	115.24465	L009	300	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-427	-29.19222	115.24474	L009	530	*Eucalyptus sp.*	KF	0						
1601-428	-29.19223	115.24481	L009	420	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-429	-29.19223	115.24491	L009	710	*Eucalyptus sp.*	KF	0						
1601-430	-29.19223	115.24502	L009	340	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-431	-29.19223	115.24552	L009	400	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

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1601-432	-29.19220	115.24573	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-433	-29.19223	115.24576	L009	300	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-434	-29.19227	115.24599	L009	340	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-435	-29.19241	115.24601	L009	330	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-436	-29.19225	115.24632	L009	350	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-437	-29.19246	115.24629	L009	400	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-438	-29.19224	115.24638	L009	730	*Eucalyptus sp.*	KF	0						
1601-439	-29.19223	115.24646	L009	470	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-440	-29.19244	115.24651	L009	500	*Eucalyptus sp.*	KF	0						
1601-441	-29.19245	115.24675	L009	310	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-442	-29.19245	115.24679	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-443	-29.19223	115.24686	L009	350	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-444	-29.19245	115.24695	L009	300	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-445	-29.19222	115.24713	L009	410	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-446	-29.19221	115.24719	L009	330	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-447	-29.19244	115.24733	L009	440	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-448	-29.19224	115.24743	L009	360	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-449	-29.19224	115.24746	L009	330	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-450	-29.19227	115.24771	L009	520	*Eucalyptus sp.*	KF	0						
1601-451	-29.19225	115.24794	L009	350	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-452	-29.19225	115.24797	L009	340	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-453	-29.19224	115.24807	L009	680	*Eucalyptus sp.*	KF	0						
1601-454	-29.19224	115.24813	L009	600	*Eucalyptus sp.*	KF	0						
1601-455	-29.19243	115.24813	L009	500	*Eucalyptus sp.*	KF	0						
1601-456	-29.19225	115.24825	L009	530	*Eucalyptus sp.*	KF	0						
1601-457	-29.19224	115.24834	L009	640	*Eucalyptus sp.*	KF	0						
1601-458	-29.19223	115.24845	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-459	-29.19213	115.24864	L009	360	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-460	-29.19212	115.24866	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-461	-29.19210	115.24874	L009	350	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-462	-29.19209	115.24875	L009	350	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-463	-29.19205	115.24885	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-464	-29.19201	115.24898	L009	420	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-465	-29.19196	115.24912	L009	480	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-466	-29.19193	115.24924	L009	320	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-467	-29.19193	115.24924	L009	340	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-468	-29.19248	115.24968	L009	400	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-469	-29.19251	115.24958	L009	430	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-470	-29.19246	115.24920	L009	390	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-471	-29.19245	115.24025	L009	300	*Eucalyptus sp.*	KF	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-472	-29.19247	115.23976	L009	500	*Eucalyptus sp.*	KF	0						
1601-473	-29.18521	115.24487	L009	380	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-474	-29.18509	115.24498	L009	300	*Eucalyptus sp.*	JS	0						
1601-475	-29.18505	115.24501	L009	400	*Eucalyptus sp.*	JS	0						3 trunks >300 mm. DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-476	-29.18499	115.24512	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-477	-29.18499	115.24520	L009	500	*Eucalyptus sp.*	JS	0						
1601-478	-29.18503	115.24542	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-479	-29.18505	115.24545	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-480	-29.18514	115.24564	L009	540	*Eucalyptus sp.*	JS	0						
1601-481	-29.18515	115.24571	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-482	-29.18519	115.24575	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-483	-29.18524	115.24586	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-484	-29.18526	115.24592	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-485	-29.18530	115.24601	L009	380	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-486	-29.18534	115.24613	L009	380	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-487	-29.18536	115.24618	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-488	-29.18544	115.24623	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-489	-29.18549	115.24625	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-490	-29.18556	115.24627	L009	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-491	-29.18564	115.24632	L009	450	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-492	-29.18568	115.24635	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-493	-29.18572	115.24637	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-494	-29.18576	115.24638	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-495	-29.18586	115.24641	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-496	-29.18590	115.24642	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-497	-29.18595	115.24642	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-498	-29.18597	115.24642	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-499	-29.18603	115.24643	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-500	-29.18613	115.24650	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-501	-29.18616	115.24653	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-502	-29.18618	115.24654	L009	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-503	-29.18621	115.24655	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-504	-29.18626	115.24657	L009	380	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-505	-29.18643	115.24662	L009	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-506	-29.18652	115.24664	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-507	-29.18658	115.24667	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-508	-29.18676	115.24672	L009	360	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-509	-29.18687	115.24679	L009	360	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-510	-29.18698	115.24685	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-511	-29.18712	115.24692	L009	360	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-512	-29.18719	115.24697	L009	380	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-513	-29.18741	115.24700	L009	320	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-514	-29.18744	115.24701	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-515	-29.18748	115.24701	L009	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-516	-29.18750	115.24702	L009	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-517	-29.18771	115.24708	L009	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

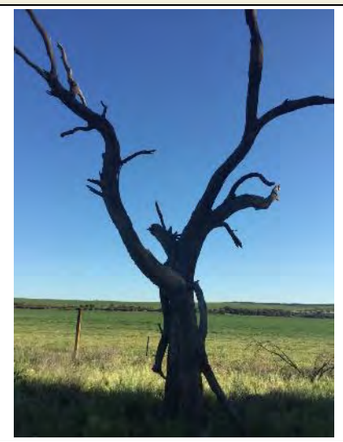
sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-518	-29.18777	115.24712	L009	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-519	-29.18784	115.24718	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-520	-29.18793	115.24721	L009	500	*Eucalyptus sp.*	JS	0						
1601-521	-29.18797	115.24725	L009	420	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-522	-29.18839	115.24733	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-523	-29.18856	115.24748	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-524	-29.18861	115.24762	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-525	-29.18863	115.24770	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-526	-29.18865	115.24786	L009	550	*Eucalyptus sp.*	JS	0						
1601-527	-29.18871	115.24797	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-528	-29.18879	115.24817	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-529	-29.18886	115.24830	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-530	-29.18895	115.24850	L009	500	*Eucalyptus sp.*	JS	0						
1601-531	-29.18901	115.24861	L009	450	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-532	-29.18902	115.24867	L009	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-533	-29.18904	115.24874	L009	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-534	-29.18905	115.24876	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-535	-29.18909	115.24882	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-536	-29.18912	115.24894	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-537	-29.18912	115.24897	L009	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-538	-29.18917	115.24907	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-539	-29.18918	115.24909	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-540	-29.18926	115.24920	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-541	-29.18930	115.24927	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-542	-29.18932	115.24938	L009	450	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-543	-29.18936	115.24946	L009	320	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-544	-29.18939	115.24955	L009	320	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-545	-29.18947	115.24966	L009	380	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-546	-29.18962	115.24991	L009	600	*Eucalyptus sp.*	JS	0						
1601-547	-29.18967	115.24992	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-548	-29.18978	115.24993	L009	500	*Eucalyptus sp.*	JS	0						
1601-549	-29.19008	115.24990	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-550	-29.19031	115.24987	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-551	-29.19040	115.24986	L009	320	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-552	-29.19071	115.24985	L009	380	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-553	-29.19075	115.24985	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-554	-29.19080	115.24986	L009	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-555	-29.19083	115.24986	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-556	-29.19086	115.24985	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-557	-29.19090	115.24986	L009	420	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-558	-29.19093	115.24986	L009	320	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-559	-29.19097	115.24988	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-560	-29.19103	115.24987	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-561	-29.19110	115.24986	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-562	-29.19114	115.24985	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future. DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-563	-29.19127	115.24984	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-564	-29.19129	115.24984	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-565	-29.19134	115.24984	L009	420	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-566	-29.19137	115.24983	L009	420	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-567	-29.19151	115.24975	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-568	-29.19159	115.24968	L009	350	*Eucalyptus sp.*	JS	0						3 trunks over 300. DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-569	-29.19166	115.24962	L009	380	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-570	-29.19167	115.24960	L009	430	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-571	-29.19173	115.24951	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-572	-29.19179	115.24943	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-573	-29.19182	115.24940	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-574	-29.18938	115.25004	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-575	-29.18903	115.25004	L009	320	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-576	-29.18893	115.25003	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-577	-29.18876	115.25003	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-578	-29.18847	115.25004	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-579	-29.18809	115.25004	L009	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-580	-29.18760	115.25003	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-581	-29.18745	115.25004	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-582	-29.18723	115.25003	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-583	-29.18705	115.25003	L009	330	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-584	-29.18696	115.25004	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-585	-29.18546	115.25003	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-586	-29.18511	115.25003	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-587	-29.18488	115.25004	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-588	-29.18464	115.25003	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-589	-29.18440	115.25004	L009	350	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-590	-29.18398	115.25002	L009	300	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-591	-29.18370	115.25003	L009	400	*Eucalyptus sp.*	JS	0						DBH between 300-500 mm so may develop suitable size hollows in the future.
1601-592	-29.20958	115.22715	L003	450	*Eucalyptus sp.*	JS	0						Spreading Eucalypt with rough and stripping bark at base, large magenta-pink flowers. DBH between 300-500 mm so may develop suitable size hollows in the future.

sitename	latitude	longitude	site-desc	DBH (mm)	tree sp.	recorder	#hollows	hollow height	suitable for BC	evidence of use	fauna in hollows	photo	comment
1601-593	-29.20894	115.24034	L004	400	*Eucalyptus sp.*	JS	0						Dead tree.

Appendix g Black cockatoo foraging quality scoring tool

Table A1 Foraging quality scoring tool template

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

Referral guideline for 3 WA threatened black cockatoo species

Appendix h BCE Carnaby's Black Cockatoo foraging habitat scoring system

Vegetation composition, condition and structure scoring based on (Bamford 2020)

Site score	Description of vegetation
0 = No foraging value	No Proteaceae, eucalypts or other potential sources of food - Water bodies (e.g. salt lakes, dams, rivers); - Bare ground; - Developed sites devoid of vegetation (e.g. infrastructure, roads, gravel pits) or with vegetation of no food value, such as some suburban landscapes; - Mown grass
1 = Negligible to low foraging value	- Scattered specimens of known food plants but projected foliage cover of these is < 2%. This could include urban areas with scattered foraging trees; - Paddocks that are lightly vegetated with melons or other known food source weeds (e.g. Erodium spp.) that represent a short-term and/or seasonal food source; - Blue Gum plantations (foraging by Carnaby's Black Cockatoos has been reported but appears to be unusual).
2 = Low foraging value	- Shrubland in which species of foraging value, such as shrubby banksias, have < 10% projected foliage cover; - Woodland with tree banksias 2-5% projected foliage cover; - Open eucalypt woodland/mallee of small-fruited species; - Paddocks that are densely vegetated with melons or other known food source weeds (e.g. Erodium spp.) that represent a short-term and/or seasonal food source.
3 = Low to moderate	- Shrubland in which species of foraging value, such as shrubby banksias, have 10-20% projected foliage cover; - Woodland with tree banksias 5-20% projected foliage cover; - Eucalypt Woodland/Mallee of small-fruited species; - Eucalypt Woodland with Marri < 10% projected foliage cover.
4 = Moderate foraging value	- Woodland/low forest with tree banksias (of key species B. attenuate and B. menziesii) 20-40% projected foliage cover; - Kwongan/ shrubland in which species of foraging value, such as shrubby banksias, have 20-40% projected foliage cover; - Eucalypt Woodland/Forest with Marri 20-40% projected foliage cover.
5 = Moderate to high	- Banksia Low Forest (of key species B. 140ttenuate and B. menziesii) with 40-60% projected foliage cover; - Banksia Low Forest (of key species B. 140ttenuate and B. menziesii) with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths;

	- Pine plantations with trees more than 10 years old (but see pine note below in moderation section).
6 = High foraging value	- Banksia Low Forest (of key species B. 141ttenuate and B. menziesii) with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium term).

4.2 Site context scoring

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

NB: 'local area' is defined as within a 15 km radius of the centre point of the study site. This is greater than the maximum distance of 12km known to be flown by Carnaby's Black Cockatoo when feeding chicks in the nest.

4.3 Species density score

Species density score is determined by the abundance of the species at a given site . Species density score is assigned a value of 0 or 1 based on whether there is evidence of foraging and/or sightings of the species frequently within the study site (at least several times a month over the year or more) . If the species is not recorded or reported infrequently a score of zero is given.