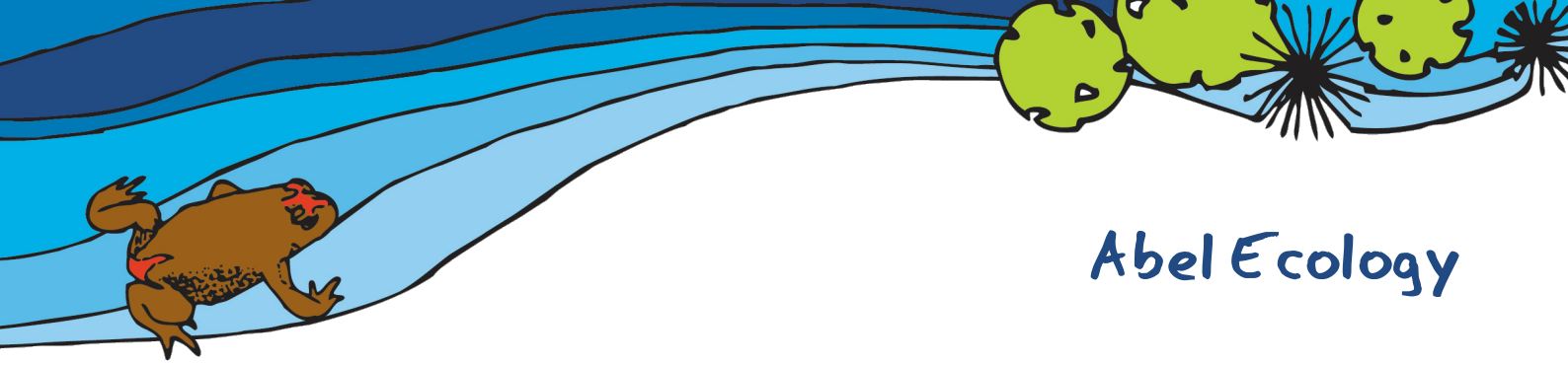

Abel Ecology

Prescribed Ecological Actions Report (PEAR)

for

Finley Health Service

24 Dawe Avenue, Finley, NSW 2713

Lot 246, DP 1016411

Proposed Upgrades

Prepared for:	NSW Health Infrastructure
Report No:	AE24-PEAR-2687-ISS-2
Prepared by:	Abel Ecology
Date:	1 July 2024

BAM Ecology Pty Ltd (T/A Abel Ecology)
2 Samuel 20:18
ACN 626 221 467 – ABN 37 626 221 467

www.snowymonaropdhub.com.au

PO Box 495, Springwood, NSW, 2777
Unit 2, 10-11 Ferguson Road
Springwood, NSW, 2777

T (02) 4751 9487
E info@abelecology.com.au
W www.abelecology.com.au
56 Sharp Street Cooma, NSW 2630

Disclaimer

This report has been prepared in accordance with the scope of services described in agreement between Abel Ecology and the Client.

In preparing this report, Abel Ecology has relied upon data, surveys and site inspection results taken at or under the particular time and or conditions specified herein. Abel Ecology has also relied on certain verbal information and documentation provided by the Client and/or third parties but did not attempt to independently verify the accuracy or completeness of that information. To the extent that the conclusions and recommendations in this report are based in whole or in part on such information, they are contingent on its validity. Abel Ecology assumes no responsibility for any consequences arising from any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to Abel Ecology.

The findings contained in this report are the result of discrete/specific methods used in accordance with normal practices and standards. To the best of our knowledge, they represent a reasonable interpretation of the general condition of the site in question. Under no circumstances, however, can it be considered that these findings represent the actual state of the site/sites at all points.

Any representation, statement, opinion or advice, expressed or implied in this publication is made in good faith but on the basis that Abel Ecology, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever, which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement, or advice referred to above. Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn by the Client.

Furthermore, this report has been prepared solely for use by the Client. Abel Ecology accepts no responsibility for its use by other parties.

I confirm that I have read the NSW Land and Environment Court Practice Note commencing on 14 May 2007, Division 2, Part 31 of the Uniform Civil Procedure Rules 2005 and the Expert Witness Code of Conduct in Schedule 7 to the Uniform Civil Procedure Rules 2005. I have prepared this advice in accordance with the requirements of the Practice Note and Code of Conduct and believe this report is consistent with the requirements of the Practice Note and the Code of Conduct. I agree to be bound by the Practice Note and Code of Conduct.

Document History

Report	Version	Prepared by	Technical Review by	Proofread by	Submission	
					Method	Date
Report	Draft A	Erin Parker	Danny Wotherspoon	Corinna Campbell	Dropbox	22 March 2024
Report	Issue 1	Erin Parker		Corinna Campbell	Dropbox	27 June 2024
Report	Issue 2	Erin Parker		Janelle Merry	Dropbox	01 July 2024

Table of Contents

Table of Figures

Table of Tables

List of Abbreviations

ALS	Actual Lot Size
BAM	Biodiversity Assessment Method
BC Act	Biodiversity Conservation Act 2016
BCR	Biodiversity Conservation Regulation 2017
BDAR	Biodiversity Development Assessment Report
d.b.h.	Diameter at breast height (~1.4 metres)
EEC	Endangered Ecological Community
ESD	Ecologically Sustainable Development
LEP	Local Environmental Plan
LGA	Local Government Area
MLS	Minimum Lot size

Note regarding maps in this report:

The diagrams/site maps used in this report have been supplied by and are used with the permission of the client.

With regard to maps provided by the Land Information Centre, Topographic maps used with the permission of © Land and Property Information, NSW.

Executive summary

The proposal is to provide upgrades to priority spaces of Finley Health Service. This involves the renovation and small extension of existing buildings.

The scope of works that is relevant for the ecological assessment includes the development of a new front of house, which calls for a small extension to the existing northern face of the building. It also includes the extension the the in-patient-unit towards the western end of the building (Figure 2).

A biodiversity survey was carried out at Finley Health Service (24 Dawe Avenue, Finley, NSW) on the 8th Feburary 2024 to assess the likely impacts of the proposal on species and ecological communities present on the site, and whether the proposal requires a Biodiversity Development Assessment Report (BDAR) because it is a likely trigger to entry into the Biodiversity Offsets Scheme identified in s. 7.4 of the *Biodiversity Conservation Act 2016.*

This report also describes whether there is likely to be any significant effect on any endangered ecological community, endangered population, threatened species or their habitats, as per the listings in the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999) (Commonwealth legislation).

The areas to be affected are the areas of building extension on the northern face, and western side of the Finley Health Service building (Figure 3).

The following considerations are triggers for entry into the Biodiversity Assessment Method.

> Threshold 3: The proposal is not likely to significantly affect any threatened species or Endangered or Critically Endangered Species.

There is no impediment to this proposal in the scope of this report. Threshold 3 is the only threshold that applies for this proposal under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for an approval under Part 5 of that *Act*, and it is not triggered by the proposal.

A report prepared using the Biodiversity Assessment Method is not recommended.

The provisions of the *EPBC Act 1999* do not apply to this proposal and it does not require referral to the Commonwealth.

Recommendations:

A Biodiversity Development Assessment Report (BDAR) is not required.

a) Implement appropriate tree protection measures for T30 and T32 to minimise the impacts of works from the adjacent IPU extension and related construction zone (Figure 1).

b) It is recommended that T12 (Figure 8) be removed as it is an exotic High Threat Weed (Cockspur Coral Tree (*Erythrina crista-galli*) and is of poor condition, declining, with a short life expectancy: "Aged development impacts likely leading to decline of tree - canopy dieback 30% - tree clearly in decline". The tree additionally has minimal fauna habitat value.

c) If Finley Health Service wish to proceed with the recommended removal of T12 or wish to plant additional landcape trees in the future, it is recommended that suitable local tree species be chosen for replacement. A short list of examples can be seen below:

Sweet quandong (*Santalum acuminatum*) - plant beside Bulloak

White cypress pine (*Callitris glaucophylla)*

Bulloak (*Allocasuarina leuhmannii)*

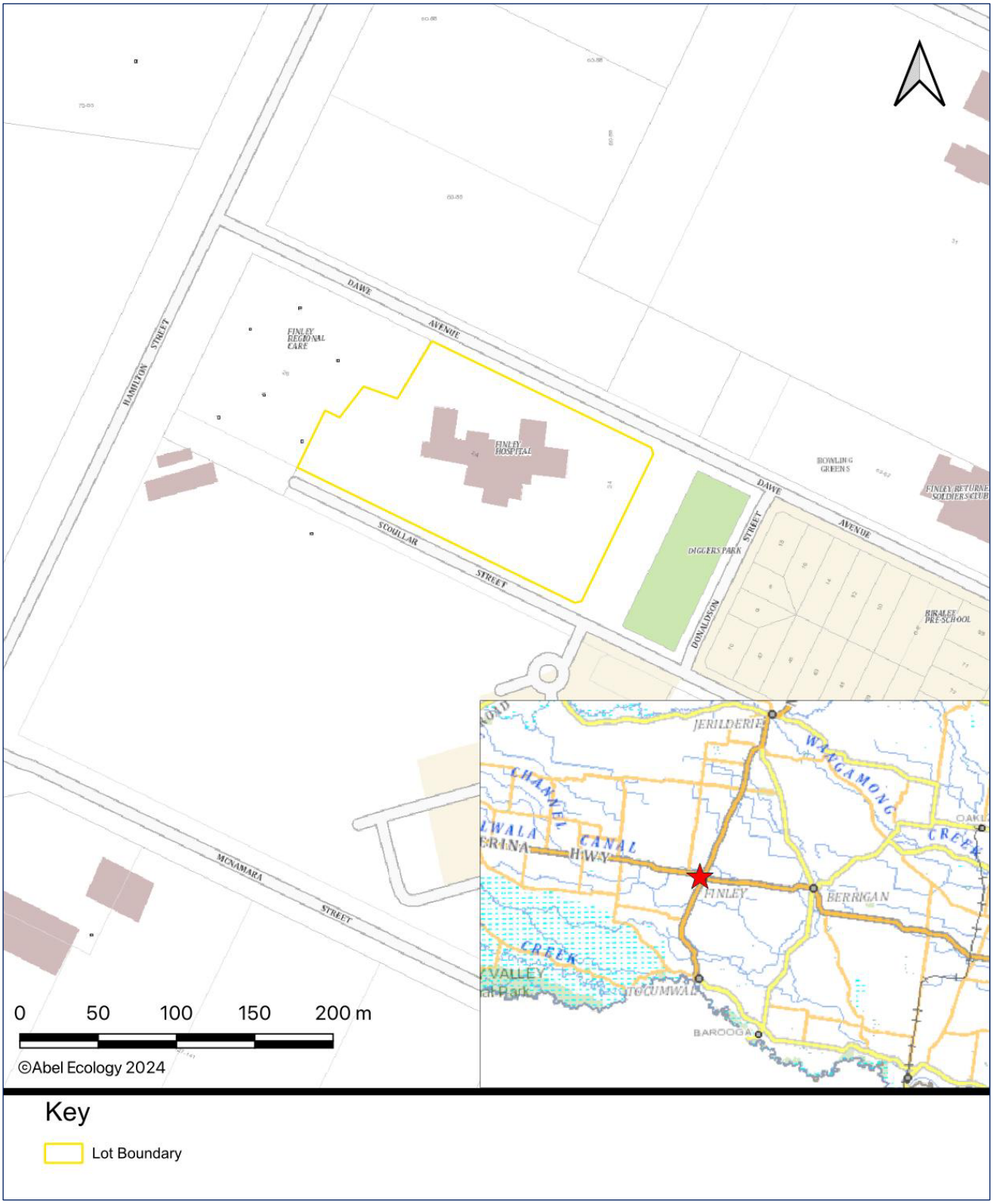

Figure 1. Locality map for Finley Health Service.

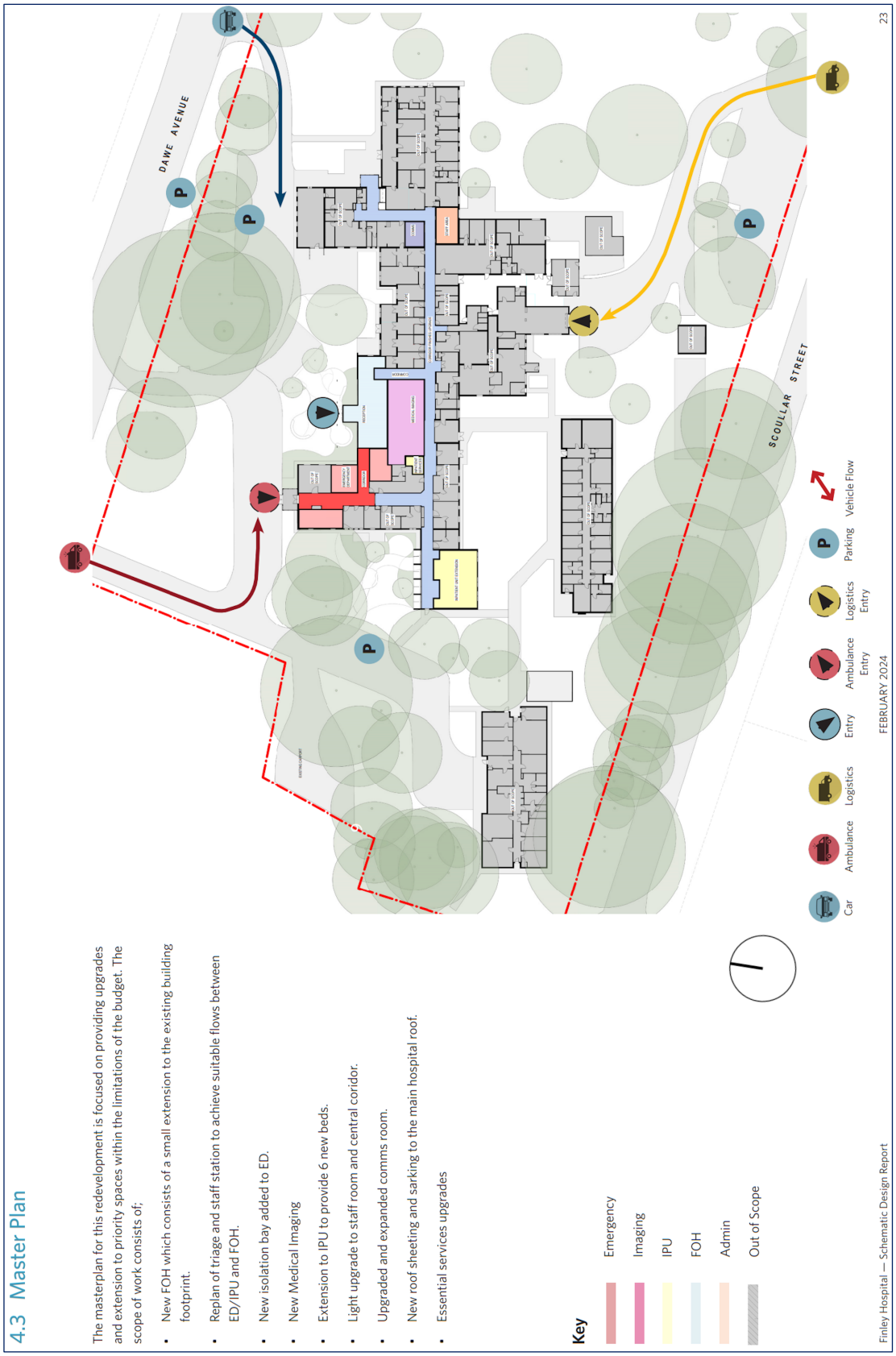

Figure 2. Master Plan of Site.

Figure 3. Area within site to be affected.

Figure 4. Aerial photo of the site and local area.

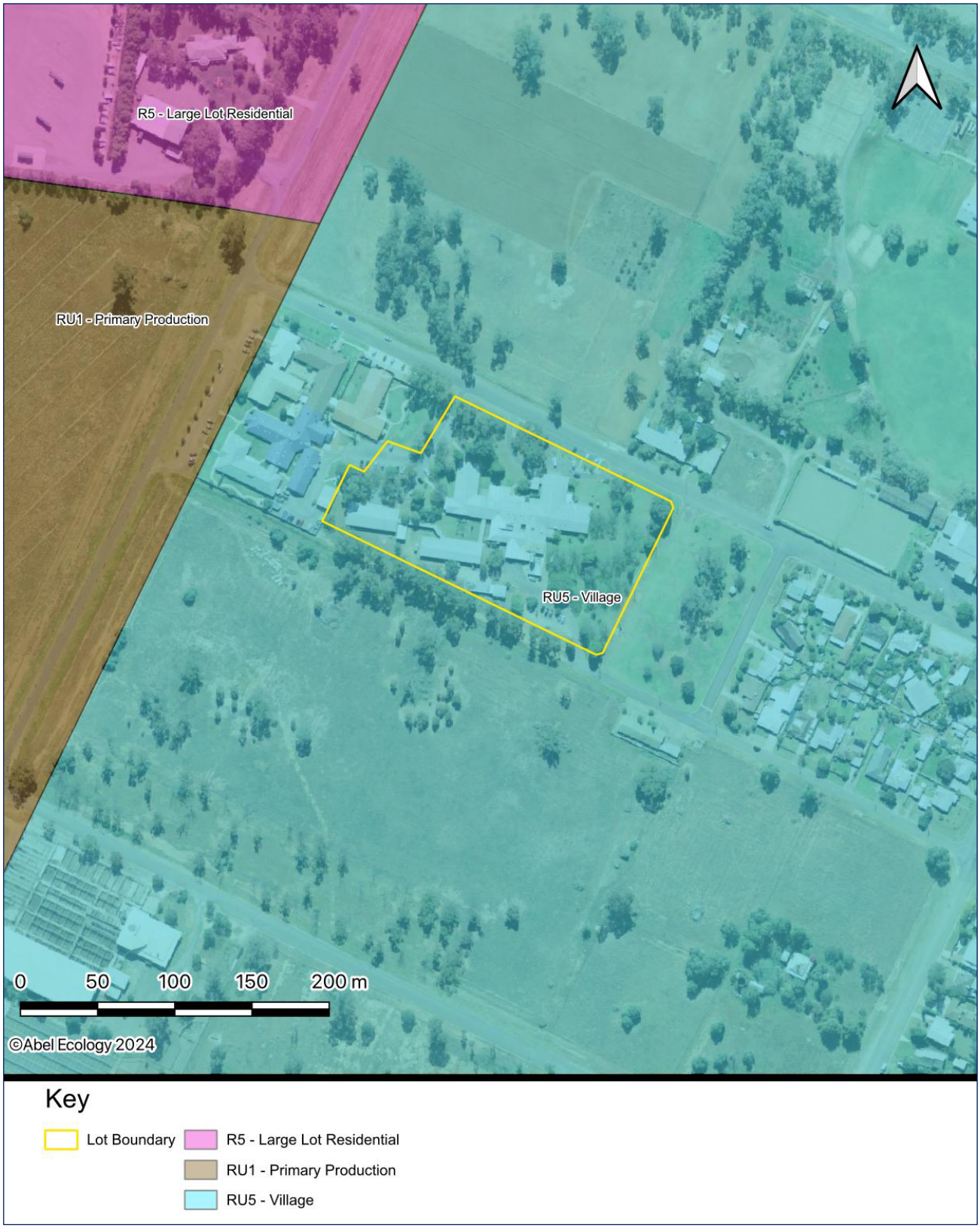

Figure 5. Site LEP zone map.

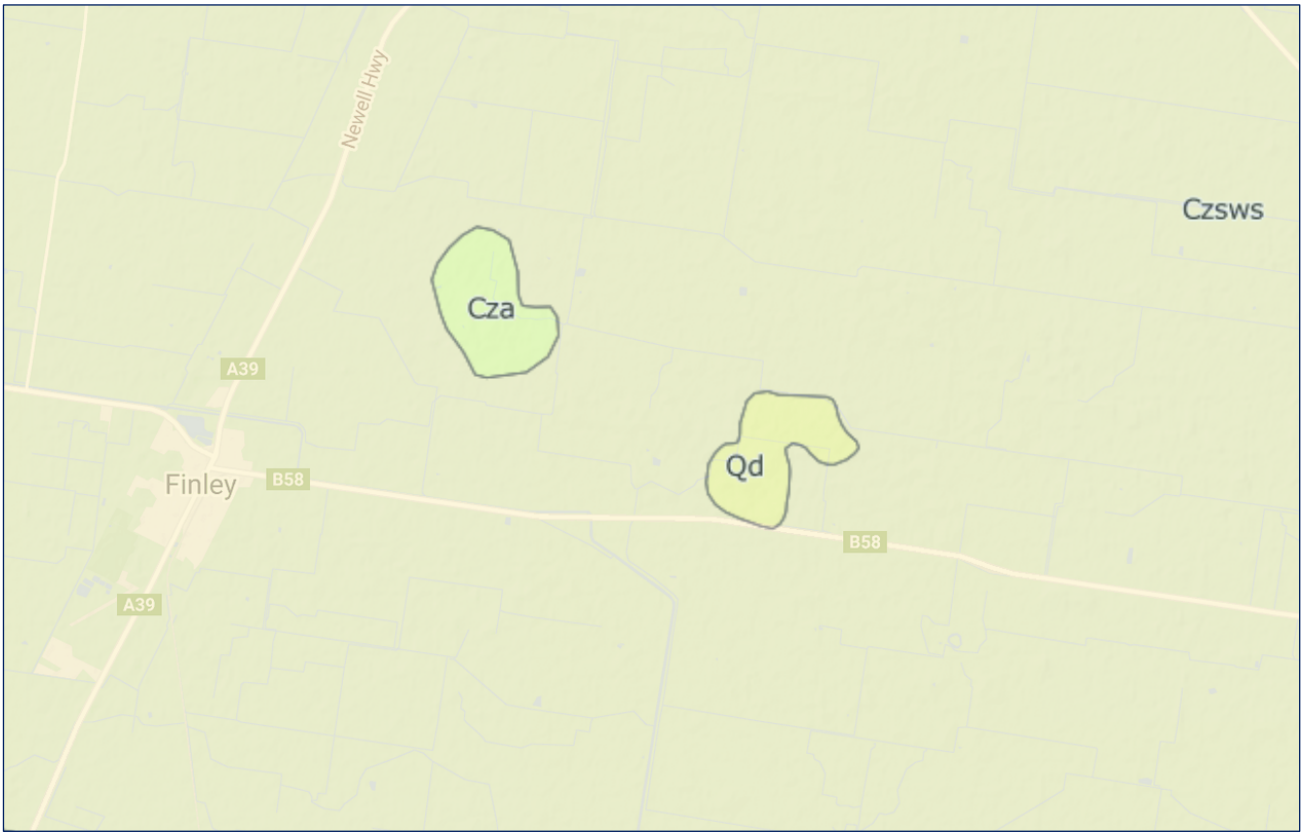

Figure 6. Site geological map.

Sand plain (Czs)

mudstone, siltstone, sandstone, conglomerate (s),

mixed sediments and volcanic rocks (w),

Source: https://www.environment.nsw.gov.au/eSpade2WebApp

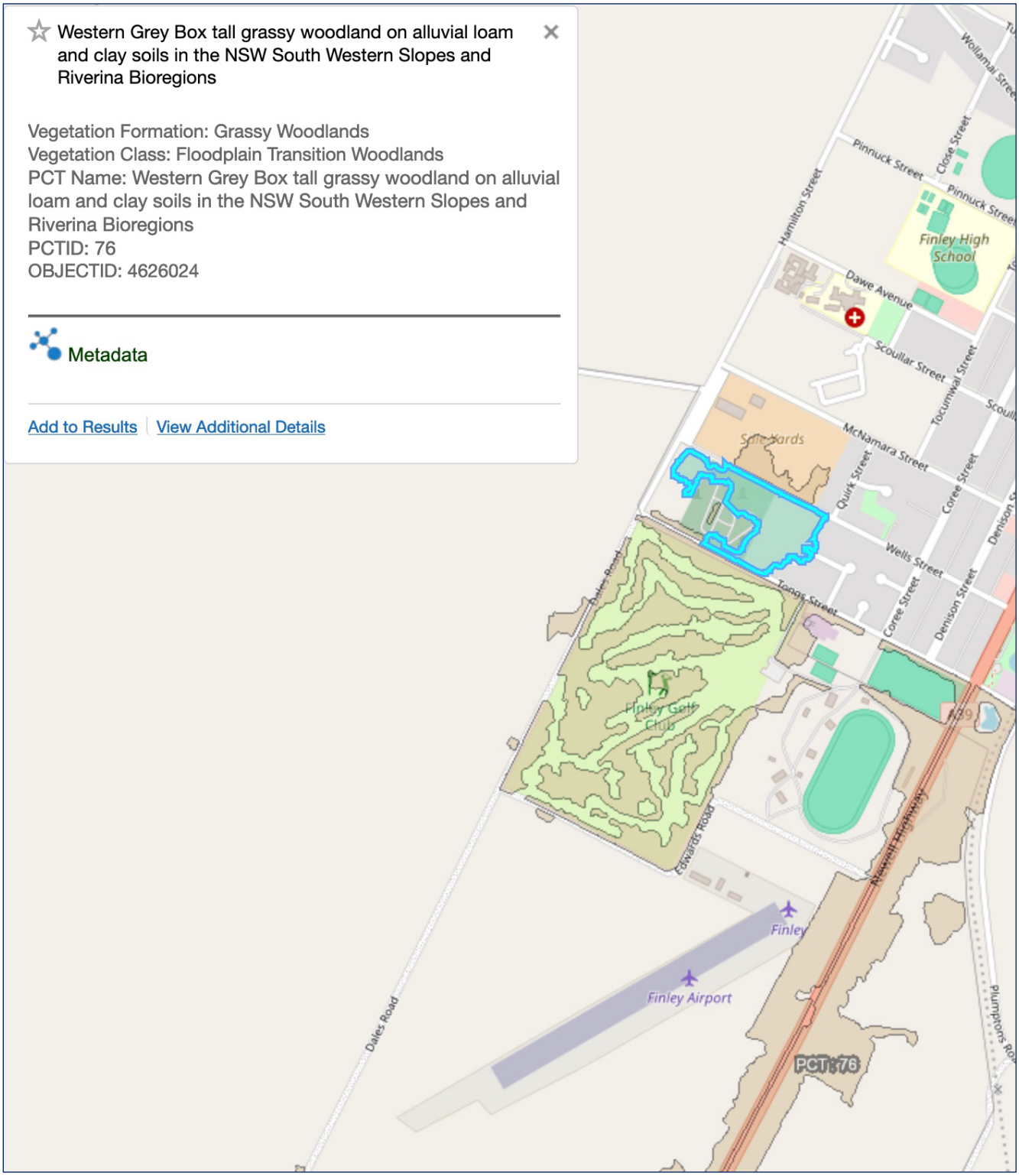

Figure 7. Vegetation and habitat map for the site.

Source: map extract from the SEED website
https://geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Public_Viewer&locale=en-AU

Figure 8. Map of tree numbers and area within site to be affected.

1. Introduction

1.1 Legislative context

This Prescribed Ecological Actions Report meets the requirements of the *Biodiversity Conservation Act 2016* to enable a determining authority to assess a proposed activity under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for an approval under Part 5 of that *Act*.

The authority must consider the following Biodiversity Offset Scheme Development Thresholds.

Threshold Trigger 3: A "significant effect" on threatened species or ecological communities

A biodiversity survey of the proposed development site at Finley Health Service (Figure 1) was undertaken on 8th February 2024. This Prescribed Ecological Actions Report investigates whether the impacts of proposal to renovate and extend the health service buildings will trigger the relevant threshold to entry into the Biodiversity Offsets Scheme, thereby requiring a Biodiversity Development Assessment Report.

This assessment addresses both 'endangered' and 'vulnerable', as required by the *Biodiversity Conservation Act 2016* (BCA 2016). Throughout this report 'threatened' refers to those species and communities listed as 'endangered' or 'vulnerable' in Schedules 1 & 2 of the *BC Act 2016*.

If the threshold is triggered, then a Biodiversity Development Assessment Report (BDAR) must be prepared by an accredited assessor for the Authority to issue a consent or an approval and a calculation of offsetting required.

1.2 The proposal

The proposal (Figure 2) is to to renovate and extend the health service buildings, and consists of:

a) buildings
b) outdoor landscape areas
c) link up to sewage system
d) utilities within the lot

1.3 Sources of information used in this assessment

Literature reviewed in order to assess possible issues relating to this site include:

Air photo (Google Maps imagery)

Survey map (Walpole Surveying, Albury)

State Vegetation Type Map (SEED)

Schedules to the *BC Act 2016*

Schedules to the *EPBC Act 1999*

State Environmental Planning Policy – SEPP Biodiversity and Conservation 2021 - Koala habitat protection

OEH Atlas of NSW Wildlife

Finley Hospital, NSW Murrumbidgee Local Health District Concept Design Report October 2023 (HDR)

Arboricultural assessment – preliminary for 2023 development at; Finley Hospital NSW 2713 (Wade Ryan Contracting)

2. Landscape features of the site and the locality

2.1 Site description

For the purposes of this report, the site (Figure 4) is defined by the property boundaries of Lot 246 DP1016411. It is approximately 2.0 ha. and the elevation is approximately 108 m above sea level.

https://www.planningportal.nsw.gov.au/find-a-property/

The land is part of an established urban settlement, located at the western edge of the Finley township.

The site is level.

There are no water bodies or creeks.

Stormwater management is by piped drainage to off site discharge points.

The site is zone as 'RU5 village' with adjacent properties zoned as a mix of primary production and residential (Figure 5). Neighboring properties include an aged care facility, a medical centre, Council reserves and vacant land.

The vegetation and fauna habitat are described in detail in Section 4 below.

2.2 History of the site

The site was developed as a health service in 1962. Staff accommodation and community buildings were added in the 1980s. Landscaping was installed as exotic grass lawns, ornamental gardens and tree plantings.

The site was previously cleared for grazing.

2.3 Geology

The geology on the site (Figure 6) consists of sand plain deposits, in the CENOZOIC UNITS (mainly unconsolidated deposits) group, including:

Sand plain (Czs)

mudstone, siltstone, sandstone, conglomerate (s),

mixed sediments and volcanic rocks (w),

https://www.environment.nsw.gov.au/eSpade2WebApp

2.4 Site Soils

Soil data was taken from soil profile report 46049 (Appendix. 7).

Profile Details: Berriqin Bore Logs - WRD Survey (1004130), Profile 383, collected by Project Water Reforms on 01 March, 2001.

Map Reference: MGA Grid Reference: Zone 55, 370613E, 6054785N. 8026 BERRIGAN (1:100000) map sheet.

Physiography: alluvial plain on alluvium lithology.

Layer 0

0.00 - 0.00 m

Layer 1

0.00 - 0.70 m Texture: medium clay
Colour: colour not recorded with no recorded mottles
Soil fauna: Activity is nil
Cracks/Macropores: Cracks are nil, macropores are nil

Layer 2

0.70 - 1.70 m Texture: light clay
Colour: colour not recorded with no recorded mottles
Soil fauna: Activity is nil
Cracks/Macropores: Cracks are nil, macropores are nil

Layer 3

1.70 - 3.30 m Texture: light clay
Colour: colour not recorded with no recorded mottles
Soil fauna: Activity is nil
Cracks/Macropores: Cracks are nil, macropores are nil

Layer 4

3.30 - 4.30 m Texture: medium clay
Colour: colour not recorded with no recorded mottles
Soil fauna: Activity is nil
Cracks/Macropores: Cracks are nil, macropores are nil
Layer Notes: With Si

2.5 Landscape features

2.5.1 Site landscape features

The following landscape features are present on the site (Table 1).

Table 1. Site landscape features

Vegetation	The site has mostly been cleared or disturbed. There are few remnant local native trees.
Non-native vegetation	The planted landscape has limited potential for foraging habitat for threatened species of bats and birds.
Wetlands/dams/watercourse	Absent
Karst, caves, crevices and other geological features of significance	Absent
Vehicle traffic and road mortality	No road kill was observed on the site. A road killed magpie was seen on Dawe Avenue outside the site.

3. Field survey methods

3.1 BioNet Atlas of NSW Wildlife website search

Records from the BioNet Atlas of NSW Wildlife website were accessed using the following search criteria:

> Licensed Report of all Valid Records of Threatened (listed on *BC Act 2016*) or Commonwealth listed Entities for a selected area around the site (North: -33.30 West: 140.26 East: 145.75 South: -35.84). Records since 01 Jan 2000 until 08 Feb 2024 returned a total of 843 records of thirty nine (39) threatened flora and fauna species.
>
> Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Licensed Report of all Valid Records of Threatened (listed on *BC Act 2016*) or Commonwealth listed Entities in selected area [North: -35.30 West: 145.26 East: 145.75 South: -35.84] recorded since 01 Jan 2000 until 08 Feb 2024 returned a total of 843 records of 39 species.

These species were considered in designing field survey targets and methods. Unsuitable candidates were eliminated on the basis of habitat requirements (Appendix. 4 and Appendix. 5).

Table 2. BioNet threatened flora & fauna species records for a 5 km radius of the site since 1 Jan 2000

Common Name	*Scientific Name*	NSW status	Comm. status	Habitat present
Magpie Goose	*Anseranas semipalmata*	V,P		No
Blue-billed Duck	*Oxyura australis*	V,P		No
Freckled Duck	*Stictonetta naevosa*	V,P		No
Australasian Bittern	*Botaurus poiciloptilus*	E1,P	E	No
Spotted Harrier	*Circus assimilis*	V,P		Foraging
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V,P		Yes
Little Eagle	*Hieraaetus morphnoides*	V,P		Foraging
Square-tailed Kite	*Lophoictinia isura*	V,P,3		Foraging
Black Falcon	*Falco subniger*	V,P		Foraging
Brolga	*Grus rubicunda*	V,P		No
Bush Stone-curlew	*Burhinus grallarius*	E1,P		No
Plains-wanderer	*Pedionomus torquatus*	E1,P,3	CE	No
Australian Painted Snipe	*Rostratula australis*	E1,P	E	No

Common Name	*Scientific Name*	NSW status	Comm. status	Habitat present
Curlew Sandpiper	*Calidris ferruginea*	E1,P	CE,C,J,K	No
Swift Parrot	*Lathamus discolor*	E1,P	CE	Foraging
Blue-winged Parrot	*Neophema chrysostoma*	V,P	V	Foraging
Superb Parrot	*Polytelis swainsonii*	V,P,3	V	Foraging
Masked Owl	*Tyto novaehollandiae*	V,P,3		Foraging
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V,P		Yes
Southern Whiteface	*Aphelocephala leucopsis*	V,P	V	Yes
White-fronted Chat	*Epthianura albifrons*	V,P		No
Painted Honeyeater	*Grantiella picta*	V,P	V	No
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	V,P		Yes
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V,P		Yes
Varied Sittella	*Daphoenositta chrysoptera*	V,P		Yes
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V,P		Yes
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*	E1,P	E	Yes
Scarlet Robin	*Petroica boodang*	V,P		Yes
Flame Robin	*Petroica phoenicea*	V,P		Yes
Diamond Firetail	*Stagonopleura guttata*	V,P		Yes
Koala	*Phascolarctos cinereus*	E1,P	E	Yes
Squirrel Glider	*Petaurus norfolcensis*	V,P		Foraging
Turnip Copperburr	*Sclerolaena napiformis*	E1	E	No
Small Scurf-pea	*Cullen parvum*	E1		No
Slender Darling Pea	*Swainsona murrayana*	V	V	No
Red Darling Pea	*Swainsona plagiotropis*	V	V	No
Silky Swainson-pea	*Swainsona sericea*	V		No
Austral Pillwort	*Pilularia novae-hollandiae*	E1,3		No
A spear-grass	*Austrostipa wakoolica*	E1	E	No

3.2 Field work effort

Over the one day of fieldwork, a total of 8 hours were spent undertaking survey work on the site and surrounding habitat areas.

Table 3. Survey dates and weather conditions

Date	Time	Temperature (°C)	Conditions	Task	Hours (hrs x no. people)
08 February 24	8:30 – 12:00	20-25	Clear, Sunny	Vegetation and fauna survey	3.5x2=7
08 February 24	15:00-15:30	30-31	Clear, Sunny	Vegetation and fauna survey	0.5x2=1

Survey effort was concentrated within the site boundaries, although adjacent surrounding vegetation was noted (Figure 4).

3.3 Flora survey method, vegetation community and habitat classification

A flora survey was conducted to compile a species list and vegetation descriptions. Targeted surveys were not made for threatened flora species (Appendix 5) due to the site being entirely disturbed and landscaped.

Vegetation quality is assessed as described below (Section 3.4). The plant community on site was classified according to the NSW VIS.

3.4 Simplified vegetation integrity assessment

On-site vegetation may be described according to a simplified vegetation integrity classification for each vegetation zone / habitat type. The simplified vegetation integrity assessment is based upon a modified version of the vegetation integrity assessment described in the NSW Biodiversity Assessment Method (BAM) 2017. This simplified assessment is based upon a qualitative assessment; no quantitative assessment was undertaken and no vegetation integrity score is calculated. The assessment requires the assessor to compare the observed vegetation with the vegetation type presumed to be present prior to 1750 (high quality native vegetation). Vegetation with good or moderate integrity usually provide higher quality habitat for a diverse range of indigenous species.

Four main qualitative classes of vegetation integrity are recognised. There is variation within each class, and in addition the class boundaries are somewhat fluid where one grades into the other.

Good integrity vegetation

Characteristics: Relatively high indigenous species diversity, diversity of flora species growth form (mix of trees, shrubs and groundcovers etc), diversity of tree size, canopy layer regeneration observed, fallen logs present on the ground, dead vegetative litter (leaves, twigs etc) cover present, weed invasion absent or minimal

Moderate integrity vegetation

Characteristics: Remnants and regenerating areas that have experienced disturbance but appear to retain the capability of recovery. Weed invasion may be moderate.

Poor integrity vegetation

Characteristics: The vegetation is highly disturbed. It typically consists of scattered trees/shrubs or clumps of trees and shrubs. Tree size diversity significantly reduced. The groundcover layer is comprised of a mix of indigenous species and exotic species. Fallen logs rare to absent, ground vegetative litter lacking.

Cleared class

Characteristics: Indigenous canopy species are absent and the indigenous understorey (shrubs/climbers/ scramblers/groundcovers) is approximately less than 50%.

Note: some vegetation types naturally lack some of the characteristics. For example, trees are rare to absent in saltmarshes, sedge swamps, alpine herbfields and arid shrublands. However, providing the other characteristics are consistent with a natural undisturbed area of the same vegetation type then these vegetation types are classified as having “good integrity”.

3.5 Fauna survey method

The survey undertaken to detect the various faunal groups was based on opportunistic observation for mammals, birds, reptiles and amphibians. Incidental observations of fauna were recorded.

Targeted surveys for threatened species were not undertaken based on the proposal’s minimal impact to potential habitat and/or the lack of suitable natural habitat, foraging opportunities and connectivity for the species onsite. Nocturnal fauna searches, call playback and microbat ultrasonic call recording was not undertaken.

Roads and road verges were searched for road-kill fauna.

Dates and weather conditions of all fieldwork were recorded and are tabulated above (Table 3).

3.5.1 Diurnal fauna searches

Searching and opportunistic observations provides an indication of types of species using a site. These methods are used to identify live animals, or indirect evidence of animal presence on the site. On occasions, specific surveys may be conducted for a targeted group or species, such as searching the margins of a dam for frogs. Generally though, birds, reptiles, frogs and mammals, or evidence of them, may all be present in the same habitat at the time of survey, therefore searching for these faunal groups is generally run concurrently. This involved:

a. opportunistic observation, and assessment of shelter site diversity and suitability for reptiles and frogs.

b. Opportunistic observations and identification of calls of species, and search for indirect evidence such as nests, feathers, scratchings and feeding signs for birds.

c. Searching for indirect evidence, such as diggings, droppings, runways and burrows, and opportunistic observations for mammals.

While rigorous surveys are likely to find more species, high species richness for birds can be recorded in a relatively short amount of time. Bird surveys are used as a simple indicator of other parameters, such as biodiversity and the functioning of the ecosystem.

3.6 Species likely to occur

Species to be listed as 'likely to occur' or 'expected' (Appendix 3), are common fauna and flora species generally found in the region, which are likely to occur on site if suitable habitat is present.

Native flora may include species local to the area (occurring in local remnants). Structure and species composition will depend upon locally occurring communities.

Expected species are common and, by definition, are not threatened species.

3.7 Limitations of the survey

This survey was conducted in the summer season. This was not suitable for winter migrants or species of winter-flowering orchids that lose their aerial stems after fruiting).

The weather conditions were clear, warm, and dry, with occasional light breeze.

This was not suitable for frogs.

Species that may use the site were not detected during the survey for the following reasons:

a) The species was present during the survey but was not detected due to dormancy, inactivity or cryptic habits.
b) The species use the site at other times of the year, but was not present during the survey due to being nomadic or migratory.

3.8 Staff associated with the field work

Table 4. Staff associated with field work and analysis of field work

Staff member	Field work	Analysis of field work
Dr Danny Wotherspoon	Fauna	Dr Danny Wotherspoon
Erin Parker	Flora	Mark Sherring

4. Survey Results: Vegetation and habitat description

4.1 Site vegetation and habitat

The site has been historically cleared, presumably for agricultural uses. Since the construction of the health service in 1962, the grounds have been seeded with *Cenchrus clandestinus* (Kikuyu Grass) which covers the majority of the site. Various planted native and exotic trees are scattered across the site. There are a few trees (T34, T35 and T56,) which have potential to be retained remnant trees, thus would hold potential ecological significance, however, these occur beyond the southern site boundary and outside of the proposal footprint (Figure 8).

Due to the altered nature of the vegetation onsite, the original vegetation community is not known and therefore not able to be formerly assigned for this report. The original community may have been Western Grey Box Tall Grassy Woodland (PCT 76), (Figure 7). The surrounding agricultural landscape precludes effective connectivity for most fauna.

Appendix 2 shows the list of flora found on the site.

The site vegetation effectively contains one vegetation zone, characterised by a predominantly planted and landscaped garden/grounds.

The vegetation across the site qualifies as the following integrity classes:

'Cleared'	Most of the vegetation within the site (~85%);
'Poor'	Areas with scattered native and exotic planted trees. The vegetation is highly disturbed with mown exotic grass and lack of shrub layer. Fallen logs and ground vegetative litter were absent.

Vegetation adjacent to the site may qualify as the following:

'Moderate'	Very small areas of native grassy occur underneath T56 (Figure 8) and mostly outside the Southern boundary within Council's road reserve.

No significant habitat trees or hollow bearing trees were observed on the site. There was a general absence of fallen logs and dead wood/coarse woody debris due to landscape maintenance. There was little complexity in the vegetation structure and cover, due to a general lack of native shrubs, grasses and groundcover species. Vegetation was largely limited to scattered trees and maintained exotic lawn.

Important habitat features that have significance for fauna occupation of the site are discussed below (Table 5).

Table 5. Significant features and observations for Vegetation Zone.

Significant features	Observations
Frequency of large trees (approx. > 80 cm DBH)	Rare. Some trees of Corymbia citriodora, Eucalyptus Leucoxylon, Liquidambar styraciflua, Pinus halepensis, and Fraxinus angustifolia subsp. oxycarpa have a DBH >70cm.
Tree regeneration and Tree stem-size diversity	Tree regeneration appears absent. No seedlings were observed onsite.
Logs, woody debris and litter cover	Absent from majority of the site.
Food resources	Native flora that are present on site including *Eucalyptus*, *Corymbia*, *Grevillea*, *Melaleuca*, *Banksia*, *Casuarina* and *Allocasuarina* (Appendix 2) may provide food resources of blossoms and seeds for some bird and mammal species.

4.2 Species and Communities of conservation concern

No threatened communities, populations or species were observed on the site.

4.3 Weeds

Two weed species were identified on site, however, they are not recorded on the List of Weeds of National Significance, List of National Environmental Alert List Weeds or List of Priority Weeds for the Murray region. They were present as planted ornamental trees and include:

Erythrina crista-galli	Cockspur Coral Tree	Tree 12 (Figure 8)
Ligustrum lucidum	Large-leaved Privet	Tree 17, 23 and 80 (Figure 8)

The NSW Noxious Weeds Act 1993 has been repealed and the *Biosecurity Act 2015* has replaced it. The *Biosecurity Act 2015* requires each landholder and/or occupier to control biosecurity matter (weeds) on their property. The landholder and/or occupier is to develop an effective control strategy and plan to ensure they meet their General Biosecurity Duty.

The General Biosecurity Duty (GBD) is imposed on any person who deals with biosecurity matter (weeds), and who knows (or ought reasonably to know) of the biosecurity risk posed (or likely to be posed), has a biosecurity duty to ensure that the risk associated with those weeds is prevented, eliminated or minimised - so far as is reasonably practicable. A requirement is that all public and private land owners or managers and all other people who deal with weed species (biosecurity matter) must use the most appropriate approach to prevent, eliminate or minimise the negative impact (biosecurity risk) of those weeds.

Council may issue a Biosecurity Direction when any owner/occupier fails in their biosecurity duty to control weeds on their land. The owner/occupier must comply with this biosecurity direction. A penalty notice or prosecution may follow if the owner/occupier fails to comply with the Biosecurity Direction.

5. Survey Results: Fauna

5.1 Species of conservation concern

No threatened fauna species were recorded on the site.

5.2 Fauna results

A total of eight (8) species were detected, all of which were birds.

Species listed as 'likely to occur' in the area are presented in Appendix 3. Note that the majority of the 'Expected Species' would not occur on the site due to the lack of habitat, but do occur in the area. All the species listed as 'likely to occur' are common throughout the locality and the region. It is unlikely that protected species will be affected at a local, regional or state-wide scale by the proposal.

The habitats for threatened species that occur in the area are tabulated in Appendix 5.

5.3 Fauna Summary

Table 6. List of fauna detected on the site

Common Name	*Scientific Name*	Observation type
White-faced Heron	*Egretta novaehollandiae*	O
Crested Pigeon	*Ocyphaps lophotes*	O
Galah	*Eolophus roseicapilla*	O
Noisy Miner	*Manorina melanocephala*	O
Australian Magpie	*Gymnorhina tibicen*	O, R
Little Corella	*Cacatua sanguinea*	O
White-winged Chough	*Corcorax melanorhamphos*	O
Raptor (unidentified)	-	O
N =	8	

Key

O = Observed R = Road kill

Species from each faunal group which are 'likely to occur' on the site can be seen in Appendix 3.

Birds

Seven (7) common bird species were detected on or adjacent to the site. This included a large group of Little Corellas (*Cacatua sanguinea*) that were actively foraging on the lawn underneath a larger Lemon Scented Gum (T74, see Figure 8) in the North-Eastern corner of the site. The Little Corellas are likely to be regular users of the site for foraging with scratchings across the lawn being observed. A group of White-Winged Choughs (*Corcorax melanorhamphos*) were observed adjacent to the site, in the land to the North of the grounds. One (1) Australian Magpie (*Gymnorhina tibicen*) was observed near the carparking space to the west of the building and another one (1) that had been road killed was observed just outside the site, near the parking bays on Dawe Avenue. One (1) White-faced Heron (*Egretta novaehollandiae*) was observed flying overhead towards the north. A Crested Pigeon (*Ocyphaps lophotes*), a Galah (*Eolophus roseicapilla*), and Noisy Miners (*Manorina melanocephala*) were also observed on site. No active nests, roosting sites or tree hollows were observed. One (1) species of Raptor was observed flying overhead. This raptor was unable to be identified. It did not land onsite nor were any large stick nests observed onsite, therefore it is unlikely the raptor is directly using the site. Species not recorded during the survey but likely to occur on the site may include *Dacelo novaeguineae* (Laughing Kookaburra) and *Strepera graculina* (Pied Currawong).

Mammals

No mammal species were detected on the site. Species not recorded during the survey but likely to occur on the site may include *Pseudocheirus peregrinus* (Common Ringtail Possum) and *Macropus giganteus* (Eastern Grey Kangaroo).

Reptiles

No reptile species were detected on the site. Species not recorded during the survey but likely to occur on the site may include *Menetia greyii* (Common Dwarf Skink).

Frogs

No frog species were detected on the site. Species not recorded during the survey but likely to occur on the site may include *Crinia signifera* (Common Eastern Froglet).

5.4 Feral fauna

Feral fauna or evidence of such was not observed on or nearby the site, however it is likely that common feral species including Rabbits and Foxes do occur in the local area.

6. Discussion of results

The site is an old urban area, developed as a health service with landscaped grounds. Landscaping comprises exotic lawns and planted trees of NSW, Australian and exotic origins.

Remnant local species mostly occur beyond the southern boundary, with some just inside the southern and northern boundaries.

Trees are generally relatively young in ecological terms, so hollows for fauna occupation are absent from the site.

The mown lawns are largely exotic turf species including Kikuyu and occasional broadleaf weeds.

Very few shrubs are present, which are consistent with the local climate conditions for horticultural maintenance.

There is no identifiable Plant Community Type (PCT) represented by the collection of planted tree species.

A number of trees are misidentified in the arborist report but correct identification (Appendix 2) does not alter our ecological assessment of the site.

Lawns are level and maintained such that there is no surface rock or coarse woody debris, and any gardens are maintained as a clean ground surface.

Structurally the habitat for fauna is limited to tree canopies, with no understorey, nor herb layer or ground level structural habitat.

The site is largely isolated from intact native forest or woodland (Figure 7).

Fauna occupation is limited to common urban birds (Table 6).

It is highly unlikely that any locally occurring threatened species would visit the site, and none are likely to depend on the site for any life cycle purpose.

The proposal is not expected to require the removal of any trees on site. However, it is recommended that T12 (Figure 8) be removed as it is an exotic High Threat Weed - Cockspur Coral Tree (Erythrina crista-galli) - and is of poor condition, declining, with a short life expectancy: “Aged development impacts likely leading to decline of tree - canopy dieback 30% - tree clearly in decline”. That tree (T12) has been incorrectly identified in the arborist report. The tree additionally has minimal fauna habitat value. If removal proceeds, it is recommended that a suitable local tree species be chosen to replace it, as identified in Section 9. The proposal may also impact two (2) planted Melaleuca trees (T30 and T32, see Figure 8) because of their proximity to the expansion zone, however with protection measures in place, potential impacts will be minimised. The extent of clearing has minimal fauna habitat value.

Consequent to the conditions as described, there is no basis to conclude that the proposal will have a significant impact on threatened species or communities, and thus this proposal does not trigger the threshold into entry into the Biodiversity Offsets Scheme, and does not require a Biodiversity Development Assessment Report.

7. Impact on biodiversity: Threshold 3

7.1 Threshold 3: Five-part test summary

Habitat requirements for locally occurring threatened faunal species, and the presence or absence of such habitat on the site, is tabulated in Appendix 4. Threatened plant species, listed in the *BC Act* and the *EPBC Act,* are shown in Appendix 5.

Under Section 7.3 of the *Biodiversity Conservation Act* several factors (listed in Appendix 1) need to be considered in deciding whether there is likely to be a Significant effect on threatened species, populations or ecological communities, or their habitats. If there is likely to be a significant effect on threatened species, etc., the proposal must be accompanied by a Biodiversity Development Assessment Report (BDAR).

Isolation from intact habitat precludes use of, or reliance on, the site by any threatened species of fauna that occur in the locality. Thus a five part test of significance is not required. However, for the sake of completeness a five part test is provided below for locally occurring species (Table 7).

While the overall proposal incorporates mitigating considerations and offsets, these are not taken into account in determining the outcome of the five-part tests.

Table 7. Summary of the five-part tests shown in full in Appendix 1.

Common Name	*Scientific Name*	NSW status	Comm. status	Recorded on site	Result
Spotted Harrier	*Circus assimilis*	V,P		No	No significant effect
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V,P		No	No significant effect
Little Eagle	*Hieraaetus morphnoides*	V,P		No	No significant effect
Square-tailed Kite	*Lophoictinia isura*	V,P,3		No	No significant effect
Black Falcon	*Falco subniger*	V,P		No	No significant effect
Swift Parrot	*Lathamus discolor*	E1,P	CE	No	No significant effect
Blue-winged Parrot	*Neophema chrysostoma*	V,P	V	No	No significant effect
Superb Parrot	*Polytelis swainsonii*	V,P,3	V	No	No significant effect
Masked Owl	*Tyto novaehollandiae*	V,P,3		No	No significant effect
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V,P		No	No significant effect
Southern Whiteface	*Aphelocephala leucopsis*	V,P	V	No	No significant effect
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	V,P		No	No significant effect
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V,P		No	No significant effect
Varied Sittella	*Daphoenositta chrysoptera*	V,P		No	No significant effect
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V,P		No	No significant effect
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*	E1,P	E	No	No significant effect
Scarlet Robin	*Petroica boodang*	V,P		No	No significant effect
Flame Robin	*Petroica phoenicea*	V,P		No	No significant effect
Diamond Firetail	*Stagonopleura guttata*	V,P		No	No significant effect
Squirrel Glider	*Petaurus norfolcensis*	V,P		No	No significant effect

The proposed upgrades to Finley Health Service is unlikely to pose a significant effect on threatened species or communities. Therefore a Biodiversity Development Assessment Report **is not required** in this case.

8. Planning Instruments

8.1 Avoid, minimise and offset under s 6.4(1) of the *BC Act*

6.4. Biodiversity conservation offsets under scheme

1. For the purposes of the biodiversity offsets scheme, the biodiversity conservation measures to offset or compensate for impacts on biodiversity values **after** any steps taken to avoid or minimise those impacts are as follows—

   a) the retirement of biodiversity credits,

   b) other actions that benefit the biodiversity values of the impacted land or other biodiversity values.

The hierarchy of avoid, minimise and offset applies once a project has triggered entry into the Biodiversity Offset Scheme (BOS). However, even though this proposal does not require entry into the BOS, to avoid confusion, the considerations are addressed here.

The objectives of avoid, minimise and offset are addressed in this proposal as follows.

- *Avoid:* The proposal is not expected to require the removal of any trees on site.
- *Minimise:* The proposed works are minor in scope and extend on or are located adjacent to existing buildings. Tree protection measures to minimise potential impacts of works to T30 and T32 are to be put in place.
- *Offset:* In view of the avoid and minimise considerations above, and that the proposal does not trigger entry into the BOS, no offset is required.

Part 5 Activities Decision support tool

https://www.olg.nsw.gov.au/councils/land-management/biodiversity/biodiversity-assessment-and-approvals-navigator/

Part 5 Activities

If the activity is likely to significantly affect threatened species a Species Impact Statement or, if the proponent chooses, a Biodiversity Development Assessment Report, must be prepared. Where a Minister is the determining authority under Part 5, the Minister is required to consult the Minister for the Environment if the activity is likely to significantly affect threatened species, unless the Minister has 'opted in' to the Biodiversity Offset Scheme by engaging an accredited assessor to prepare a Biodiversity Development Assessment Report. If the determining authority under Part 5 is not a Minister, the determining authority is not to carry out the activity or grant approval to carry out the activity if it is likely to significantly affect threatened species without obtaining the concurrence

of the Environment Agency Head. However, concurrence from the Environmental Agency Head is not required if a Biodiversity Development Assessment Report has been obtained.

For Part 5 activities, an activity is "likely to significantly affect threatened species" if it is carried out in an area of outstanding biodiversity value or likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in section 7.3 of the *Biodiversity Conservation Act 2016*. The biodiversity offset scheme threshold trigger does not apply.

8.2 LEP and DCP Locally significant species or vegetation communities

The proposed activity aligns with the zoning objectives for RU5 Village. The proposed activity does not occur on land mapped with any ecological constraints for the Berrigan LEP 2013.

8.3 SEPP Biodiversity and Conservation 2021 - Koala habitat protection

State Environmental Planning Policy (Biodiversity and Conservation) 2021. 'Biodiversity and Conservation SEPP'. (Commenced 1 March 2022; supersedes Koala SEPPs 2020, 2021).

From the associated Fact Sheet (March 2022) for the Biodiversity and Conservation SEPP:

> 'Chapter 4 – Koala habitat protection 2021' contains the land-use planning and assessment framework from the Koala SEPP 2021 for koala habitat within Metropolitan Sydney and the Riverina and applies to all zones except RU1, RU2 and RU3 in the short term – it will apply to all zones once the Koala SEPP 2020 is repealed."

The site is zoned 'RU5 Village'.

The site falls within the Riverina Koala management area.

One (1) koala has been recorded within 10 km of the site in the last 20 years. Koalas, or evidence of Koalas, was not seen on site and it is unlikely that any Koalas use the site. The site is not considered core Koala habitat.

The following five (5) species were found in the proposal area: *Corymbia eximia, Eucalyptus crebra, Eucalyptus prava*, *Eucalyptus mannifera* and *Eucalyptus sideroxylon* (Table 8).

No Scheduled Koala feed trees listed under the Riverina Koala Management Area occur naturally on the site. However, the species listed above are Koala feed trees under alternate Koala Management areas including the Central Coast, Darling Riverine Plains, Northwest slopes and Central and Southern Tablelands regions from which they may have been planted. These trees were considered in the Site Koala tree survey results.

The result is **negative**. Less than 15% of the trees within the proposal area and on the site are Scheduled SEPP species (Table 9). The site is not potential Koala habitat, therefore considered an unsuitable candidate for the five part test.

Table 8. Site Koala tree survey results

Species	Count	Percentage of trees on site lot	Feed tree or use
Corymbia eximia	2	2.5%	Not listed
Eucalyptus crebra	2	2.5%	Not listed
Eucalyptus prava	1	1.2%	Not listed
Eucalyptus mannifera	1	1.2%	Not listed
Eucalyptus sideroxylon	1	1.2%	Not listed
Total	**7 of 81**	**8.6%**	

Table 9. Koala tree species for the Riverina Koala management area.

The following species list is sourced from the NSW Department of Planning and Environment website: www.environment.nsw.gov.au, as of 19 March 2024. This list contains the same species as in Schedule 3 of the SEPP https://legislation.nsw.gov.au/view/html/inforce/current/epi-2021-0722#sch.3

Common Name	*Scientific Name*
High Use	
River Red Gum	*Eucalyptus camaldulensis*
Black Box	*Eucalyptus largiflorens*
Irregular Use	
White Cypress Pine	*Callitris glaucophylla*
Yellow Box	*Eucalyptus melliodora*
Low Use	
Gum Coolibah	*Eucalyptus intertexta*
No Sourced Evidence of Use	
Belah	*Casuarina cristata*
White Box	*Eucalyptus albens*
Western Grey Box	*Eucalyptus microcarpa*
Bimble Box	*Eucalyptus populnea*

Note: The Use class was assigned from the NSW Government review of koala tree use across New South Wales for either the Central and Southern Tablelands KMA or the Far West and South West KMA:

https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Native-animals/review-of-koala-tree-use-across-nsw-180385.pdf

8.4 Environment Protection and Biodiversity Conservation Act 1999

https://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf

8.4.1 Protected matters

The Protected Matters Search Tool was used to find relevant Matters of National Environmental Significance (MNES) on or near the site (5km buffer applied). The outputs are shown in Appendix 6 and summarised below.

Five Wetlands of International Importance are recorded for the area including:

1. Hattah-Kulkyne Lakes (200 - 300km downstream from site)
2. Banrock Station Wetland Complex (400 - 500km downstream from site)
3. The Coorong, and Lakes Alexandrina and Albert Wetland (500 - 600km downstream from site)
4. Riverland (400 - 500km downstream from site)
5. Nsw Central Murray State Forests (20 - 30km downstream from site)

Five Listed Threatened Ecological Communities are recorded in the area including:

1. Natural Grasslands of the Murray Valley Plains
2. White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
3. Weeping Myall Woodlands
4. Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions
5. Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia

These ecological communities are protected under Commonwealth legislation by the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999) and are listed as Endangered or Critically Endangered.

There are no migratory species known from the site or local area.

No World Heritage Properties or National Heritage Places are recorded for the area.

There were no Critically Endangered or Endangered species or communities, or Vulnerable species recorded on the site. The provisions of the *EPBC Act* do not apply to this proposal.

8.5 Planning for Bushfire protection

The proposed activity is not on fire prone mapped land.

9. Conclusion and Recommendations

The threshold below is **not** triggered:

1. Five Part Tests / A "significant effect" on threatened species or ecological communities.

Therefore, a Biodiversity Development Assessment Report (BDAR) **is not required**.

Recommendations:

A consent or approval may be issued with the following conditions:

- Implement appropriate tree protection measures for T30 and T32 to minimise the impacts of works from the adjacent IPU extension and related construction zone (Figure 1).
- It is recommended that T12 (Figure 8) be removed as it is an exotic High Threat Weed (Cockspur Coral Tree (*Erythrina crista-galli*) and is of poor condition, declining, with a short life expectancy: "Aged development impacts likely leading to decline of tree - canopy dieback 30% - tree clearly in decline". The tree additionally has minimal fauna habitat value.
- If Finley Health Service wish to proceed with the recommended removal of T12 or wish to plant additional landcape trees in the future, it is recommended that suitable local tree species be chosen for replacement. A short list of examples can be seen below:

  Sweet quandong (*Santalum acuminatum*) - plant beside Bulloak

  White cypress pine (*Callitris glaucophylla)*

- Bulloak (*Allocasuarina leuhmannii*

10. References

Barrett, G., Silcocks, A., Barry, S., Cunningham, R. and Poulter, R. (2003). *The New Atlas of Australian Birds*. Royal Australasian Ornithologists Union, Victoria.

Briggs, J. D., and Leigh, J. H. (1995). *Rare or Threatened Australian Plants*. CSIRO, Canberra.

Brooker, M. I. H. and Kleinig, D. A. (1990). *Field Guide to Eucalypts, Volume 1. South-eastern Australia*. Inkata, North Ryde.

Cogger, H. G. (1983). *Reptiles and Amphibians of Australia*. Reed, Frenchs Forest.

Department of the Environment, Water, Heritage and the Arts (Australian Government) (2010). *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest – A guide to identifying and protecting the nationally threatened ecological community.* Policy Statement 3.31.

Ehmann, H. (1992). *Encyclopaedia of Australian Animals Reptiles*. Angus and Robertson, Pymble.

Ehmann, H. (Ed.) (1997). Overview Chapter, pages 13 - 42 In *Threatened Frogs of New South Wales: Habitats, Status and Conservation*. Frog and Tadpole Study Group of NSW Inc.

McDonald R. C., Isbell, R. F., Speight, J. G., Walker, J., & Hopkins, M. S., (1990). *Australian soil and land survey field handbook Second edition*. Inkata Press, Melbourne.

McKenzie, N. J., Grundy, M. J., Webster, R. and Ringrose, A. J. (2008). Gui*delines for Surveying Soil and Land Resources (Second Edition).* CSIRO Publishing, Collingwood, VIC.

NSW Office of Environment and Heritage (2017) Biodiversity Assessment Method (BAM).

NSW Scientific Committee, (2001). *Final Determination for Clearing of Native Vegetation*, Key Threatening Process.

Robinson, M. (1993). *A Field Guide to Frogs of Australia*. Reed/Australian Museum, Chatswood.

Simpson, K., Day, N. & Trusler, P. (1996). *Field Guide to the Birds of Australia*. Penguin, Ringwood, Vic.

Specht. R. L. (1970). *Vegetation of the Australian Environment*. G. W. Leeper (Ed.), 4th Edition, CSIRO, Melbourne.

Strahan, R. (Ed.) (1995). *The Mammals of Australia*. Reed, Sydney.

Watson, D. M. (2011). *A productivity-based explanation for woodland bird declines: poorer soils yield less food.* EMU, 111: 10-18.

Watson, D. M. (2010). Optimizing inventories of diverse sites: insights from Barro Colorado Island birds. *Methods in Ecology and Evolution*, 1: 280-291.

Wotherspoon, D, (2019) *Handheld spotlights for Night Field Survey. Consulting Ecology* (43): 10-11.

Wotherspoon, D. and Mackinnon, M. (2020) Jetbeam BC40 Pro Handheld Spotlights for Night Field Survey. *Consulting Ecology* (45): 9-11.

Appendix 1. Five-part tests

While the overall proposal incorporates mitigating considerations and offsets, these are not taken into account in determining the outcome of the **five-part** tests.

The Assessment of Significance (Office of Environment and Heritage (OEH)) states that "*Proposed measures that mitigate, improve or compensate for the action, development or activity should not be considered in determining the degree of the effect on threatened species, populations or ecological communities, unless the measure has been used successfully for that species in a similar situation.*"

Table 10. Species addressed in the five-part tests

Common Name	*Scientific Name*	NSW status
Spotted Harrier	*Circus assimilis*	V,P
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V,P
Little Eagle	*Hieraaetus morphnoides*	V,P
Square-tailed Kite	*Lophoictinia isura*	V,P,3
Black Falcon	*Falco subniger*	V,P
Swift Parrot	*Lathamus discolor*	E1,P
Blue-winged Parrot	*Neophema chrysostoma*	V,P
Superb Parrot	*Polytelis swainsonii*	V,P,3
Masked Owl	*Tyto novaehollandiae*	V,P,3
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V,P
Southern Whiteface	*Aphelocephala leucopsis*	V,P
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	V,P
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V,P
Varied Sittella	*Daphoenositta chrysoptera*	V,P
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V,P
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*	E1,P
Scarlet Robin	*Petroica boodang*	V,P
Flame Robin	*Petroica phoenicea*	V,P
Diamond Firetail	*Stagonopleura guttata*	V,P
Koala	*Phascolarctos cinereus*	E1,P
Squirrel Glider	*Petaurus norfolcensis*	V,P

Key

P = Protected

V = Vulnerable

E = Endangered

E1 = Endangered Species

7.2 Development or activity "likely to significantly affect threatened species"

(1) For the purposes of this Part, development or an activity is **"likely to significantly affect threatened species"** if:

(a) it is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in section 7.3, or

(b) the development exceeds the biodiversity offsets scheme threshold if the biodiversity offsets scheme applies to the impacts of the development on biodiversity values, or

(c) it is carried out in a declared area of outstanding biodiversity value.

(2) To avoid doubt, subsection (1) (b) does not apply to development that is an activity subject to environmental impact assessment under Part 5 of the *Environmental Planning and Assessment Act 1979*.

7.3 Test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats

(1) The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

(c) in relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

Diurnal Raptors

Common name	*Scientific name*	NSW status	Comm. status
Spotted Harrier	*Circus assimilis*	V,P	-
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V,P	-
Little Eagle	*Hieraaetus morphnoides*	V,P	-
Square-tailed Kite	*Lophoictinia isura*	V,P,3	-

Key

V = Vulnerable P = Protected

Spotted Harrier *Circus assimilis*

https://threatenedspecies.bionet.nsw.gov.au/profile?id=20134

- Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.
- Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months.
- Preys on terrestrial mammals (eg bandicoots, bettongs, and rodents), birds and reptile, occasionally insects and rarely carrion.

White-bellied Sea Eagle *Haliaeetus leucogaster*

https://threatenedspecies.bionet.nsw.gov.au/profile.aspx?id=20322

- Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea.
- Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh.
- Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest).
- Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass.
- Feed mainly on fish and freshwater turtles, but also waterbirds, reptiles, mammals and carrion.

- Hunts its prey from a perch or whilst in flight (by circling slowly, or by sailing along 10–20 m above the shore). Prey is usually carried to a feeding platform or (if small) consumed in flight, but some items are eaten on the ground.
- May be solitary or live in pairs or small family groups consisting of a pair of adults and dependent young.
- Typically lays two eggs between June and September with young birds remaining in the nest for 65-70 days.

Little Eagle Hieraaetus morphnoides

http://threatenedspecies.bionet.nsw.gov.au/profile.aspx?id=20131

- Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used.
- Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.
- Lays two or three eggs during spring, and young fledge in early summer.
- Preys on birds, reptiles and mammals, occasionally adding large insects and carrion.

Square-tailed Kite Lophoictinia isura

https://threatenedspecies.bionet.nsw.gov.au/profile.aspx?id=10495

- Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses.
- In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland.
- Is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage.
- Appears to occupy large hunting ranges of more than 100 km^2.
- Breeding is from July to February, with nest sites generally located along or near watercourses, in a fork or on large horizontal limbs.

Five Part Test

a. in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

No. Although the site may hold potential opportunities for foraging for these species, due to the lack of structural habitat, and groundcover necessary to support a great abundance of prey, these opportunities are very limited. It is unlikely that this site would be a preferred foraging site. These species are also known to prefer, or have been associated with, the presence of watercourses/riparian corridors for foraging and nesting, of which is absent from the site and proposal footprint.

No evidence of large stick nests were observed on site and it is unlikely that the site is currently being used as a breeding site.

Additionally the proposal involves very minimal removal of exotic vegetation; a very minor modification to a low potential habitat. This extent of clearing does not impose upon small patches of suspected remnant trees.

The proposal is unlikely to have any adverse effects on the life cycle of any of these threatened species such that a local viable population will be placed at risk of extinction.

b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

Not applicable. This test is for a group of threatened species.

ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable. This test is for a group of threatened species.

c. in relation to the habitat of a threatened species, population or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The proposal is not expected to require the removal of any trees on site. The proposal will involve clearing of a relatively small area (~1,175 m^2) of exotic lawn (Kikuyu Grass). The extent of clearing has minimal fauna habitat value for diurnal raptors.

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

No. The proposal will involve construction on a predominantly cleared area, and the site is already largely isolated from intact native forest or woodland. The vegetation that is to be removed does not hold any significant habitat or outstanding biodiversity value. Vegetation that is not within the proposal footprint, including remant tree patches occurring beyond and just within the southern boundary, will provide greater connectivity services. Thus, the area is unlikely to become fragmented due to the proposal.

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

Negligible.

Criterion	Comment
Area and quality of habitat within the locality	The locality is a largely agricultural, and rural residential matrix. The surrounding areas are predominantly degraded and cleared of natural vegetation for agricultural use. The habitat that remains within the locality is greatly limited to landscape plantings and remnants within road reserves. The closest area of likely high quality intact woodland is ~20km south of the site, bordering the Murray River.
Area and quality of habitat on site in relation to the area and quality of habitat in the locality.	Habitat on the site is similar to the surrounding urban area, including landscape plantings and small patches of remnant vegetation within adjacent road reserves.
Role of habitat to be affected in sustaining habitat connectivity in the locality.	The small area to be affected does not play a key connectivity role for species in the locality. The proposal will involve construction on a predominately cleared area, and the site is already largely isolated from intact native forest or woodland. Development of the site is not expected to affect these species' ability to move across the landscape.
Ecological integrity of habitat to be affected on site, in relation to the ecological integrity, tenure and security of the habitat which will remain both on site and in locality.	The site is surrounded by private residential and rural agricultural land. Habitat on site is of similary integrity to that of surrounding lands. The vegetation not proposed for removal within the grounds have a moderate security. The habitat in the surrounding landscape is primarily within private tenure and therefore has less security.

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No. There are no areas of outstanding biodiversity value within the site or within the vicinity of the proposal.

e. whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

No. The proposed development is not expected to require the "Clearing of native vegetation", which is a key threatening process relevant to these species. Key threatening processes are listed under the *Biodiversity Conservation Act 2016* and the Commonwealth's *EPBC Act, 1999*.

Conclusion

The proposed activity is unlikely to have a significant effect on Spotted Harrier, White-bellied Sea Eagle, Little Eagle or Square-tailed Kite. Therefore, a BDAR **is not recommended.**

Woodland Birds and Nocturnal Raptors

Common name	*Scientific name*	NSW status
Swift Parrot	*Lathamus discolor*	E1,P
Blue-winged Parrot	*Neophema chrysostoma*	V,P
Superb Parrot	*Polytelis swainsonii*	V,P,3
Masked Owl	*Tyto novaehollandiae*	V,P,3
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V,P
Southern Whiteface	*Aphelocephala leucopsis*	V,P
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	V,P
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V,P
Varied Sittella	*Daphoenositta chrysoptera*	V,P
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V,P
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*	E1,P
Scarlet Robin	*Petroica boodang*	V,P
Flame Robin	*Petroica phoenicea*	V,P
Diamond Firetail	*Stagonopleura guttata*	V,P

Key

CE = Critically Endangered

E1 = Endangered Species

E = Endangered

V = Vulnerable

P = Protected

Swift Parrot *Lathamus discolor*

https://threatenedspecies.bionet.nsw.gov.au/profile?id=10455

- Migrates to the Australian south-east mainland between February and October.
- On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations.
- Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Forest Red Gum *E. tereticornis*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*.
- Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana*, Blackbutt *E. pilularis*, and Yellow Box *E. melliodora*.
- Return to some foraging sites on a cyclic basis depending on food availability.
- Following winter they return to Tasmania where they breed from September to January, nesting in old trees with hollows and feeding in forests dominated by Tasmanian Blue Gum *Eucalyptus globulus*.

Blue-winged Parrot *Neophema chrysostoma*

https://www.environment.gov.au/biodiversity/threatened/species/pubs/726-conservation-advice-31032023.pdf

- Blue-winged parrots breed on mainland Australia south of the Great Dividing Range in southern Victoria from, and sometimes in the far south-east of South Australia, and the north-western, central and eastern parts of Tasmania.
- They tend to favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones.
- Pairs or small parties of blue-winged parrots forage mainly near or on the ground for seeds of a wide range of native and introduced grasses, herbs and shrubs.
- During the breeding season (spring and summer), birds occupy eucalypt forests and woodlands.
- Nests are made in hollows, preferably with a vertical opening, in live or dead trees or stumps.

Superb Parrot *Polytelis swainsonii*

http://threatenedspecies.bionet.nsw.gov.au/profile.aspx?id=10645

- Inhabit Box-Gum, Box-Cypress-pine and Boree woodlands and River Red Gum forest.
- In the Riverina superb parrots nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum forest or woodland.
- Superb Parrots nest in tree hollows with an entrance diameter of 6 cm or wider, and that are at least 3.5 m above the ground.
- Breed between September and January, with nesting typically from October to late December.
- May forage up to 10 km from nesting sites, primarily in grassy box woodland.
- Feed in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants. Also eaten are fruits, berries, nectar, buds, flowers, insects and grain.

Masked Owl Tyto *novaehollandiae*

https://threatenedspecies.bionet.nsw.gov.au/profile.aspx?id=10820

- Lives in dry eucalypt forests and woodlands from sea level to 1100 m.
- A forest owl, but often hunts along the edges of forests, including roadsides.
- The typical diet consists of tree-dwelling and ground mammals, especially rats.
- Pairs have a large home-range of 500 to 1000 hectares.
- Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.

Brown Treecreeper (eastern subspecies*) Climacteris picumnus victoriae*

http://threatenedspecies.bionet.nsw.gov.au/profile.aspx?id=10171

- Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range.
- Mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species.
- Also found in mallee and River Red Gum (Eucalyptus camaldulensis) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses.
- Usually not found in woodlands with a dense shrub layer.
- Fallen timber is an important habitat component for foraging.
- When foraging in trees and on the ground, they peck and probe for insects, mostly ants, amongst the litter, tussocks and fallen timber, and along trunks and lateral branches.
- Hollows in standing dea or live trees and tree stumps are essential for nesting.

Southern Whiteface Climacteris *Aphelocephala leucopsis*

https://www.environment.gov.au/biodiversity/threatened/species/pubs/529-conservation-advice-31032023.pdf

- Southern whiteface occur across most of mainland Australia south of the tropics, from the north-eastern edge of the Western Australian wheatbelt, east to the Great Dividing Range.
- Southern whitefaces live in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both, in habitats dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains.
- Southern whiteface forage almost exclusively on the ground, favouring habitat with low tree densities and an herbaceous understorey litter cover.
- Mainly feed on insects, spiders, and seeds, largely gleaned from the bare ground or leaf litter.
- Breeding takes place from July to October throughout most of the species' range, however, the
- timing of breeding can be affected by rainfall in arid regions.
- Build large bulky domed nest of grass, bark and roots, usually in a hollow or crevice, although sometimes in low bushes

Black-chinned Honeyeater (eastern subspecies) *Melithreptus gularis gularis*
http://threatenedspecies.bionet.nsw.gov.au/profile.aspx?id=10523

- In NSW it is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina.
- Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (Eucalyptus sideroxylon), White Box (E. albens), Inland Grey Box (E. microcarpa), Yellow Box (E. melliodora), Blakely's Red Gum (E. blakelyi) and Forest Red Gum (E. tereticornis).
- Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees.
- Feeding territories are large making the species locally nomadic. Birds forage over large home ranges of at least 5 hectares.
- Moves quickly from tree to tree, foraging rapidly along outer twigs, underside of branches and trunks, probing for insects. Nectar is taken from flowers, and honeydew is gleaned from foliage.
- Breeds solitarily or co-operatively, with up to five or six adults, from June to December.
- The nest is placed high in the crown of a tree, in the uppermost lateral branches, hidden by foliage. It is a compact, suspended, cup-shaped nest.

Grey-crowned Babbler (eastern subspecies) *Pomatostomus temporalis temporalis*
http://threatenedspecies.bionet.nsw.gov.au/profile.aspx?id=10660

- In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains.
- Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains.
- Flight is laborious so birds prefer to hop to the top of a tree and glide down to the next one. Birds are generally unable to cross large open areas.
- Feed on invertebrates, either by foraging on the trunks and branches of eucalypts and other woodland trees or on the ground, digging and probing amongst litter and tussock grasses.
- Build and maintain several conspicuous, dome-shaped stick nests about the size of a football. A nest is used for roosting each night. Nests are usually located in shrubs or sapling eucalypts, although they may be built in the outermost leaves of low branches of large eucalypts.
- Breed between July and February.
- Territories range from one to fifty hectares (usually around ten hectares) and are defended all year.

Varied Sittella *Daphoenositta chrysoptera*

http://threatenedspecies.bionet.nsw.gov.au/profile.aspx?id=20135

- Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland.
- Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy.
- Builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.

Dusky Woodswallow *Artamus cyanopterus cyanopterus*

http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20303

- Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.
- Primarily eats invertebrates, mainly insects, which are captured whilst hovering or sallying above the canopy or over water. Also frequently hovers, sallies and pounces under the canopy, primarily over leaf litter and dead timber. Also occasionally take nectar, fruit and seed.
- Depending on location and local climatic conditions (primarily temperature and rainfall), the dusky woodswallow can be resident year round or migratory. In NSW, after breeding, birds migrate to the north of the state and to southeastern Queensland, while Tasmanian birds migrate to southeastern NSW after breeding.

  Migrants generally depart between March and May, heading south to breed again in spring. There is some evidence of site fidelity for breeding. Although dusky woodswallows generally breed as solitary pairs or occasionally in small flocks, large flocks may form around abundant food sources in winter. Large flocks may also form before migration, which is often undertaken with other species.
- Nest is an open, cup-shape, made of twigs, grass, fibrous rootlets and occasionally casuarina needles, and may be lined with grass, rootlets or infrequently horsehair, occasionally unlined. Nest sites vary greatly, but generally occur in shrubs or low trees, living or dead, horizontal or upright forks in branches, spouts, hollow stumps or logs, behind loose bark or in a hollow in the top of a wooden fence post. Nest sites may be exposed or well concealed by foliage.

South-eastern Hooded Robin *Melanodryas cucullata cucullata*

http://threatenedspecies.bionet.nsw.gov.au/profile.aspx?id=10519

- The south-eastern form (subspecies cucullata) is found from Brisbane to Adelaide and throughout much of inland NSW
- Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas.
- Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.
- Often perches on low dead stumps and fallen timber or on low-hanging branches, using a perch-and-pounce method of hunting insect prey.
- Territories range from around 10 ha during the breeding season, to 30 ha in the non-breeding season.
- May breed any time between July and November.
- The nest is a small, neat cup of bark and grasses bound with webs, in a tree fork or crevice, from less than 1 m to 5 m above the ground.

Scarlet Robin *Petroica boodang*

http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20133

- The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs.
- This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps.
- Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat.
- The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude.
- The Scarlet Robin is primarily a resident in forests and woodlands, but some adults and young birds disperse to more open habitats after breeding.
- In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees.
- The Scarlet Robin is a quiet and unobtrusive species which is often quite tame and easily approached.
- Birds forage from low perches, fence-posts or on the ground, from where they pounce on small insects and other invertebrates which are taken from the ground, or off tree trunks and logs; they sometimes forage in the shrub or canopy layer.
- In autumn and winter, the Scarlet Robin joins mixed flocks of other small insectivorous birds which forage through dry forests and woodlands.

Flame Robin *Petroica phoenicea*

http://threatenedspecies.bionet.nsw.gov.au/profile.aspx?id=20129

- Breeds in spring to late summer in upland tall moist eucalypt forests and woodlands, often on ridges and slopes.
- Prefers clearings or areas with open understoreys.
- The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense.
- Nests are an open cup nest made of plant materials and spider webs, often near the ground and are built in sheltered sites, such as shallow cavities in trees, stumps or banks.
- In winter, birds migrate to drier more open habitats in the lowlands (i.e. valleys below the ranges, and to the western slopes and plains).
- In winter lives in dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees.
- In winter, occasionally seen in heathland or other shrublands in coastal areas.
- Birds forage from low perches, from which they sally or pounce onto small invertebrates which they take from the ground or off tree trunks, logs and other coarse woody debris.

Diamond Firetail *Stagonopleura guttata*

http://threatenedspecies.bionet.nsw.gov.au/profile.aspx?id=10768

- It is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Cental and South Western Slopes and the North West Plains and Riverina.
- Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus pauciflora Woodlands.
- Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities.
- Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.
- Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season).
- Breed between August and January.
- Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests.
- Birds roost in dense shrubs or in smaller nests built especially for roosting.

Five Part Test

a. in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

No. Although the site holds potential opportunities for foraging for these species, due to the lack of structural habitat, and groundcover necessary to support a great abundance of invertebrate, reptile or small mammal prey, these opportunities are largely limited to fruit, seed, pollen and nectar of some tree species onsite. It is unlikely that this site would be a preferred foraging site for these threatened species.

No evidence of nesting was observed on site and due to the trees being relatively young, hollows for fauna occupation are absent from the site. It is unlikely that these species would depend on the site for life cycle purposes.

Additionally the proposal involves very minimal removal of exotic vegetation, a very minor modification to a low potential habitat. This extent of clearing does not impose upon small patches of suspected remnant trees.

The proposal is unlikely to have any adverse effects on the life cycle of any of these threatened species such that a local viable population will be placed at risk of extinction.

b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

Not applicable. This test is for a group of threatened species.

ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable. This test is for a group of threatened species.

c. in relation to the habitat of a threatened species, population or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The proposal is not expected to require the removal of any trees on site. The proposal will involve clearing of a relatively small area (~1,175m^2) of exotic lawn (Kikuyu Grass). The extent of clearing has minimal fauna habitat value for these threatened woodland birds and nocturnal raptor species.

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

No. The proposal will involve construction on a predominately cleared area, and the site is already largely isolated from intact native forest or woodland. The vegetation that is to be removed does not hold any significant habitat or outstanding biodiversity value. Vegetation that is not within the proposal footprint, including remant tree

patches occurring beyond and just within the southern boundary, will provide greater connectivity services. Thus, the area is unlikely to become fragmented due to the proposal.

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

Negligible.

Criterion	Comment
Area and quality of habitat within the locality	The locality is a largely agricultural, and rural residential matrix. The surrounding areas are predominantly degraded and cleared of natural vegetation for agricultural use. The habitat that remains within the locality is greatly limited to landscape plantings and remnants within road reserves. The closest area of likely high quality intact woodland is ~20km south of the site, bordering the Murray River.
Area and quality of habitat on site in relation to the area and quality of habitat in the locality	Habitat on the site is similar to the surrounding urban area, including landscape plantings and small patches of remnant vegetation within adjacent road reserves.
Role of habitat to be affected in sustaining habitat connectivity in the locality	The small area of to be affected does not play a key connectivity role for species in the locality. The proposal will involve construction on a predominately cleared area, and the site is already largely isolated from intact native forest or woodland. Development of the site is not expected to affect these species' ability to move across the landscape.
Ecological integrity of habitat to be affected on site, in relation to the ecological integrity, tenure and security of the habitat which will remain both on site and in locality.	The site is surrounded by private residential and rural agricultural land. Habitat on site is of similary integrity to that of surrounding lands. The vegetation not proposed for removal within the grounds have a moderate security. The habitat in the surrounding landscape is primarily within private tenure and therefore has less security.

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No. There are no areas of outstanding biodiversity value within the site or within the vicinity of the proposal.

e. whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

No. The proposal is not expected to require the "Clearing of native vegetation", which is a key threatening process relevant to these species. Key threatening processes are listed under the *Biodiversity Conservation Act 2016* and the Commonwealth's *EPBC Act, 1999*.

Conclusion

The proposed activity is unlikely to have a significant effect on Swift Parrot, Blue-winged Parrot, Superb Parrot, Masked Owl, Brown Treecreeper (eastern subspecies), Southern Whiteface, Black-chinned Honeyeater (eastern subspecies), Grey-crowned Babbler (eastern subspecies), Varied Sittella, Dusky Woodswallow, South-eastern Hooded Robin, Scarlet Robin, Flame Robin or Diamond Firetail.

Therefore, a BDAR **is not required.**

Squirrel Glider

Common name	*Scientific name*	NSW status	Comm. status
Squirrel Glider	*Petaurus norfolcensis*	V,P	-

Key

V = Vulnerable

Squirrel Glider *Petaurus norfolcensis*

http://threatenedspecies.bionet.nsw.gov.au/profile.aspx?id=10604

- The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria.
- Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas.
- Prefers mixed species stands with a shrub or Acacia midstorey.
- Live in family groups of a single adult male one or more adult females and offspring.
- Require abundant tree hollows for refuge and nest sites.
- Diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.

Five Part Test

a. in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

No. Squirrel Gliders are not known on site and were not observed. There was no evidence to suggest Squirrel Gliders were on site or had been using the site previously.

The site holds limited opportunities for foraging of fruit, seed, pollen and nectar of some tree species onsite. It is unlikely that this site would be a preferred foraging site for these threatened species.

Due to the trees being relatively young, there were no hollows that Squirrel Gliders are dependent on, for refuge and nesting, observed on the site. It is highly unlikely that these species would depend on the site for life cycle purposes.

Additionally the proposal involves very minimal removal of exotic vegetation, a very minor modification to a low potential habitat. The proposal is unlikely to have any adverse effects on the life cycle of any of these threatened species such that a local viable population will be placed at risk of extinction.

b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

Not applicable. This test is for a threatened species.

ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable. This test is for a threatened species.

c. in relation to the habitat of a threatened species, population or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The proposal is not expected to require the removal of any trees on site. The proposal will involve clearing of a relatively small area (~1,175 m^2) of exotic lawn (Kikuyu Grass). The extent of clearing has minimal fauna habitat value for Squirrel Glider.

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

No. The proposal will involve construction on a predominately cleared area, and the site is already largely isolated from intact native forest or woodland. The vegetation that is to be removed does not hold any significant habitat or outstanding biodiversity value. Vegetation that is not within the proposal footprint including remant tree patches occurring beyond and just within the southern boundary will provide greater connectivity services. Thus, the area is unlikely to become fragmented due to the proposal.

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

Negligible.

Criterion	Comment
Area and quality of habitat within the locality.	The locality is a largely agricultural and rural, residential matrix. The surrounding areas are predominantly degraded and cleared of natural vegetation for agricultural use. The habitat that remains within the locality is greatly limited to landscape plantings and remnants within road reserves. The closest area of likely high quality intact woodland is ~20km south of the site, bordering the Murray River.
Area and quality of habitat on site in relation to the area and quality of habitat in the locality.	Habitat on the site is similar to the surrounding urban area, including landscape plantings and small patches of remnant vegetation within adjacent road reserves.
Role of habitat to be affected in sustaining habitat connectivity in the locality.	The small area to be affected does not play a key connectivity role for species in the locality. The proposal will involve construction on a predominately cleared area, and the site is already largely isolated from intact native forest or woodland. Development of the site is not expected to affect these species' ability to move across the landscape.
Ecological integrity of habitat to be affected on site, in relation to the ecological integrity, tenure and security of the habitat which will remain both on site and in locality.	The site is surrounded by private residential and rural agricultural land. Habitat on site is of similary integrity to that of surrounding lands. The vegetation not proposed for removal within the grounds have a moderate security. The habitat in the surrounding landscape is primarily within private tenure and therefore has less security.

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No. There are no areas of outstanding biodiversity value within the site or within the vicinity of the proposal.

e. whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

No. The proposal is not expected to require the "Clearing of native vegetation", which is a key threatening process relevant to these species. Key threatening processes are listed under the *Biodiversity Conservation Act 2016* and the Commonwealth's *EPBC Act, 1999*.

Conclusion

The proposed activity is unlikely to have a significant effect on Squirrel Glider.

Therefore, a BDAR **is not recommended.**

Appendix 2. Flora species list and Tree ID corrections

The coordinates for this locality are -35.641695 Lat, 145.568213 Long (GDA94 - Geographic).

Common name	*Scientific name*	Species Origin	Tree numbers (Figure 8)
Queen Palm	*Arecastrum romanzoffianum*	Exotic	1, 2, 3, 4, 5, 65, 66
Lemon-scented Gum	*Corymbia citriodora*	NSW Native	6, 7, 74
-	*Eucalyptus leucoxylon subsp. leucoxylon*	Local NSW species	9
-	*Eucalyptus costata (syn. Incrassata)*	Local NSW species	18
Silky Oak	*Grevillea Robusta*	Aus Native	10, 11, 20
Cockspur Coral Tree	*Erythrina crista-galli* (HTW)	Exotic	12
Yellow Bloodwood	*Corymbia eximia*	NSW Native	13, 73
Flax-leaved Paperbark	Melaleuca linariifolia	NSW Native	14
Brush box	*Lophostemon confertus*	NSW Native	15
Narrow-leaved Ironbark	*Eucalyptus crebra*	NSW Native	16, 27
Large-leaved Privet	*Ligustrum lucidum* (HTW)	Exotic	17, 23, 80
Red-flowering Gum	*Corymbia ficifolia*	Aus Native	19
Orange Gum	*Eucalyptus prava*	Aus Native	21
Brittle Gum	*Eucalyptus mannifera*	NSW Native	22
Prickly-leaved Tea Tree	*Melaleuca styphelioides*	NSW Native	24, 32, 72
Mugga Ironbark	*Eucalyptus sideroxylon*	NSW Native	25
-	*Eucalyptus celastroides subsp. celastroides*	Aus Native	26, 28
Black Tea-Tree	*Melaleuca bracteata*	NSW Native	30, 33
Oleander	*Nerium oleander*	Exotic	31
Claret Ash	*Fraxinus oxycarpa "Raywoodii"*	Exotic	49, 54, 55
Sweetgum	*Liquidambar styraciflua*	Exotic	50

Common name	*Scientific name*	Species Origin	Tree numbers (Figure 8)
Lemon	Citrus x limon	Exotic	51
Aleppo Pine	*Pinus halepensis*	Exotic	52, 58, 63
Lacebark Tree	*Brachychiton discolor*	NSW Native	53
Peppermint box	*Eucalyptus (odorata ?)*	Aus native	56
Bracelet Honey-myrtle	*Melaleuca armillaris*	NSW Native	57
Desert Ash	*Fraxinus angustifolia subsp. oxycarpa*	Exotic	61, 62, 64
Coast Banksia	*Banksia integrifolia*	NSW Native	69
Pincushion hakea	*Hakea laurina*	Aus native	70
New Zealand Christmas Bush	*Metrosideros excelsa*	Exotic	71
Water Gum	Tristaniopsis laurina	Aus Native	76
-	*Photinia robusta*	Exotic	75, 77
River She Oak	*Casuarina cunninghamiana*	NSW Native	59, 60
Drooping She Oak	*Allocasuarina verticillata*	Endemic	29
Kikuyu Grass	*Cenchrus clandestinus*	Exotic	-

Key

HTW – High Threat Weed

Note: Trees numbered 34-48 were not identified by Abel Ecology as they were outside of the site boundary and not within the proposal's footprint.

Tree ID corrections

Tree #	Arborist identification	Abel identification
8	Lemon Scented Gum *(Corymbia citriodora)*	Tree was found to be removed.
9	Eucalyptus – unidentified species	*Eucalyptus leucoxylon subsp. leucoxylon*
12	WA Red Flowering Gum (*Corymbia ficifolia*)	Cockspur Coral Tree (*Erythrina crista-galli)* (HTW)
18	Eucalyptus – unidentified species	*Eucalyptus incrassata*
21	Eucalyptus – unidentified species	Orange Gum *Eucalyptus macrocarpa*)
57	Melaleuca – unidentified species	Bracelet Honey-myrtle (*Eucalyptus macrocarpa)*
76	Native Frangipani (*Hymenosporum flavum)*	Water Gum (*Eucalyptus macrocarpa*)
26, 28	Dwarf Sugar Gum (*Eucalyptus cladocalyx nana)*	*Eucalyptus celastroides subsp. celastroides*
56	Western Grey Box (*Eucalyptus macrocarpa)*	*Eucalyptus (odorata?)*

Appendix 3. Expected fauna species in the Berrigan Shire

Mammals

Common name	*Scientific name*
Platypus	*Ornithorhynchus anatinus*
Short-beaked Echidna	*Tachyglossus aculeatus*
Yellow-footed Antechinus	*Antechinus flavipes*
Koala	*Phascolarctos cinereus*
Bare-nosed Wombat	*Vombatus ursinus*
Sugar Glider	*Petaurus breviceps*
Squirrel Glider	*Petaurus norfolcensis*
Common Ringtail Possum	*Pseudocheirus peregrinus*
brushtail possum	*Trichosurus sp.*
Common Brushtail Possum	*Trichosurus vulpecula*
unidentified macropod	*Macropod sp.*
Eastern Grey Kangaroo	*Macropus giganteus*
kangaroo / wallaby	*Macropus sp.*
Swamp Wallaby	*Wallabia bicolor*
Little Red Flying-fox	*Pteropus scapulatus*
Flying-fox	*Pteropus sp.*
Water-rat	*Hydromys chrysogaster*
House Mouse *	*Mus musculus*
Black Rat *	*Rattus rattus*
Dingo, domestic dog *	*Canis lupus*
Fox *	*Vulpes vulpes*
Brown Hare *	*Lepus capensis occidentalis*
Rabbit *	*Oryctolagus cuniculus*

Frogs

Common Name	*Scientific Name*
Eastern Sign-bearing Froglet	*Crinia parinsignifera*
Common Eastern Froglet	*Crinia signifera*
Eastern Banjo Frog	*Limnodynastes dumerilii*
Long-thumbed Frog	*Limnodynastes fletcheri*
Giant Banjo Frog	*Limnodynastes interioris*
Spotted Grass Frog	*Limnodynastes tasmaniensis*
Sudell's Frog	*Neobatrachus sudellae*
Peron's Tree Frog	*Litoria peronii*

Reptiles

Common Name	*Scientific Name*
Broad-shelled Turtle	*Chelodina expansa*
Eastern Snake-necked Turtle	*Chelodina longicollis*
Macquarie River Turtle	*Emydura macquarii macquarii*
Tessellated Gecko	*Diplodactylus tessellatus*
Wood Gecko	*Diplodactylus vittatus*
Patternless Delma	*Delma inornata*
Ragged Snake-eyed Skink	*Cryptoblepharus pannosus*
Magela Ctenotus	*Ctenotus gagudju*
Robust Ctenotus	*Ctenotus robustus*
Straight-browed Ctenotus	*Ctenotus spaldingi*
Pale-flecked Garden Sunskink	*Lampropholis guichenoti*
Arnhem Coast Fine-lined Slider	*Lerista stylis*
Common Dwarf Skink	*Menetia greyii*
South-eastern Morethia Skink	*Morethia boulengeri*

Common Name	*Scientific Name*
Eastern Blue-tongue	*Tiliqua scincoides*
Gippsland Water Dragon	*Intellagama lesueurii howitti*
Eastern Water Dragon	*Intellagama lesueurii lesueurii*
Prong-snouted Blind Snake	*Anilios bituberculatus*
Carpet & Diamond Pythons	*Morelia spilota*
Tiger Snake	*Notechis scutatus*
Red-bellied Black Snake	*Pseudechis porphyriacus*
Eastern Brown Snake	*Pseudonaja textilis*
Curl Snake	*Suta suta*

Birds

Common Name	*Scientific Name*
Emu	*Dromaius novaehollandiae*
Helmeted Guineafowl *	*Numida meleagris*
Stubble Quail	*Coturnix pectoralis*
Magpie Goose	*Anseranas semipalmata*
Chestnut Teal	*Anas castanea*
Grey Teal	*Anas gracilis*
Mallard *	*Anas platyrhynchos*
Australasian Shoveler	*Anas rhynchotis*
Pacific Black Duck	*Anas superciliosa*
Hardhead	*Aythya australis*
Musk Duck	*Biziura lobata*
Australian Wood Duck	*Chenonetta jubata*
Black Swan	*Cygnus atratus*
Plumed Whistling-Duck	*Dendrocygna eytoni*
Pink-eared Duck	*Malacorhynchus membranaceus*

Common Name	*Scientific Name*
Blue-billed Duck	*Oxyura australis*
Australian Shelduck	*Tadorna tadornoides*
Hoary-headed Grebe	*Poliocephalus poliocephalus*
Australasian Grebe	*Tachybaptus novaehollandiae*
Rock Dove *	*Columba livia*
	Geopelia placida
Peaceful Dove	*Geopelia striata*
Crested Pigeon	*Ocyphaps lophotes*
Common Bronzewing	*Phaps chalcoptera*
Spotted Turtle-Dove *	*Spilopelia chinensis*
Tawny Frogmouth	*Podargus strigoides*
Australian Owlet-nightjar	*Aegotheles cristatus*
Fork-tailed Swift	*Apus pacificus*
Australasian Darter	*Anhinga novaehollandiae*
Little Pied Cormorant	*Microcarbo melanoleucos*
Great Cormorant	*Phalacrocorax carbo*
Unidentified Cormorant	*Phalacrocorax sp.*
Little Black Cormorant	*Phalacrocorax sulcirostris*
Pied Cormorant	*Phalacrocorax varius*
Australian Pelican	*Pelecanus conspicillatus*
Intermediate Egret	*Ardea intermedia*
White-necked Heron	*Ardea pacifica*
Australasian Bittern	*Botaurus poiciloptilus*
Cattle Egret	*Bubulcus ibis*
Eastern Great Egret	*Casmerodius modesta*
Little Egret	*Egretta garzetta*
White-faced Heron	*Egretta novaehollandiae*
Australian Little Bittern	*Ixobrychus dubius*

Common Name	*Scientific Name*
Nankeen Night Heron	*Nycticorax caledonicus*
Yellow-billed Spoonbill	*Platalea flavipes*
Royal Spoonbill	*Platalea regia*
Glossy Ibis	*Plegadis falcinellus*
Australian White Ibis	*Threskiornis moluccus*
Straw-necked Ibis	*Threskiornis spinicollis*
Collared Sparrowhawk	*Accipiter cirrocephalus*
Brown Goshawk	*Accipiter fasciatus*
Wedge-tailed Eagle	*Aquila audax*
Swamp Harrier	*Circus approximans*
Spotted Harrier	*Circus assimilis*
Black-shouldered Kite	*Elanus axillaris*
White-bellied Sea-Eagle	*Haliaeetus leucogaster*
Whistling Kite	*Haliastur sphenurus*
Little Eagle	*Hieraaetus morphnoides*
Square-tailed Kite	*Lophoictinia isura*
Black Kite	*Milvus migrans*
Brown Falcon	*Falco berigora*
Nankeen Kestrel	*Falco cenchroides cenchroides*
Australian Hobby	*Falco longipennis*
Peregrine Falcon	*Falco peregrinus*
Black Falcon	*Falco subniger*
Brolga	*Grus rubicunda*
Eurasian Coot	*Fulica atra*
Dusky Moorhen	*Gallinula tenebrosa*
Buff-banded Rail	*Hypotaenidia philippensis*
Purple Swamphen	*Porphyrio porphyrio*
Australian Spotted Crake	*Porzana fluminea*

Common Name	*Scientific Name*
Black-tailed Native-hen	*Tribonyx ventralis*
Bush Stone-curlew	*Burhinus grallarius*
Banded Stilt	*Cladorhynchus leucocephalus*
Black-winged Stilt	*Himantopus himantopus*
Red-necked Avocet	*Recurvirostra novaehollandiae*
Black-fronted Dotterel	*Elseyornis melanops*
Red-kneed Dotterel	*Erythrogonys cinctus*
Masked Lapwing	*Vanellus miles*
Banded Lapwing	*Vanellus tricolor*
Sharp-tailed Sandpiper	*Calidris acuminata*
Curlew Sandpiper	*Calidris ferruginea*
Latham's Snipe	*Gallinago hardwickii*
Marsh Sandpiper	*Tringa stagnatilis*
Red-chested Button-quail	*Turnix pyrrhothorax*
Whiskered Tern	*Chlidonias hybrida*
Silver Gull	*Chroicocephalus novaehollandiae*
	Gelochelidon nilotica macrotarsa
Sulphur-crested Cockatoo	*Cacatua galerita*
Little Corella	*Cacatua sanguinea*
Long-billed Corella	*Cacatua tenuirostris*
Galah	*Eolophus roseicapilla*
Cockatiel	*Nymphicus hollandicus*
Musk Lorikeet	*Glossopsitta concinna*
Budgerigar	*Melopsittacus undulatus*
Blue-winged Parrot	*Neophema chrysostoma*
Blue Bonnet	*Northiella haematogaster*
Crimson Rosella	*Platycercus elegans*
[Yellow Rosella]	*Platycercus elegans flaveolus*

Common Name	*Scientific Name*
Eastern Rosella	*Platycercus eximius*
Superb Parrot	*Polytelis swainsonii*
Red-rumped Parrot	*Psephotus haematonotus*
Fan-tailed Cuckoo	*Cacomantis flabelliformis*
Shining Bronze-Cuckoo	*Chalcites lucidus*
Pallid Cuckoo	*Heteroscenes pallidus*
Southern Boobook	*Ninox novaeseelandiae*
Eastern Barn Owl	*Tyto javanica*
Azure Kingfisher	*Ceyx azureus*
Laughing Kookaburra	*Dacelo novaeguineae*
Sacred Kingfisher	*Todiramphus sanctus*
Rainbow Bee-eater	*Merops ornatus*
Dollarbird	*Eurystomus orientalis*
	Climacteris picumnus picumnus
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*
White-throated Treecreeper	*Cormobates leucophaea*
Superb Fairy-wren	*Malurus cyaneus*
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*
Striated Thornbill	*Acanthiza lineata*
Yellow Thornbill	*Acanthiza nana*
Brown Thornbill	*Acanthiza pusilla*
Buff-rumped Thornbill	*Acanthiza reguloides*
Unidentified Thornbill	*Acanthiza sp.*
Chestnut-rumped Thornbill	*Acanthiza uropygialis*
Southern Whiteface	*Aphelocephala leucopsis*
Western Gerygone	*Gerygone fusca*
White-throated Gerygone	*Gerygone olivacea*
White-browed Scrubwren	*Sericornis frontalis*

Common Name	*Scientific Name*
Weebill	*Smicrornis brevirostris*
Spotted Pardalote	*Pardalotus punctatus*
Striated Pardalote	*Pardalotus striatus*
Spiny-cheeked Honeyeater	*Acanthagenys rufogularis*
Red Wattlebird	*Anthochaera carunculata*
Blue-faced Honeyeater	*Entomyzon cyanotis*
White-fronted Chat	*Epthianura albifrons*
Noisy Miner	*Manorina melanocephala*
Brown-headed Honeyeater	*Melithreptus brevirostris*
White-eared Honeyeater	*Nesoptilotis leucotis*
Little Friarbird	*Philemon citreogularis*
Noisy Friarbird	*Philemon corniculatus*
Fuscous Honeyeater	*Ptilotula fusca*
White-plumed Honeyeater	*Ptilotula penicillata*
White-browed Babbler	*Pomatostomus superciliosus*
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*
Eastern Shrike-tit	*Falcunculus frontatus frontatus*
Varied Sittella	*Daphoenositta chrysoptera*
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*
White-bellied Cuckoo-shrike	*Coracina papuensis*
White-winged Triller	*Lalage sueurii*
Grey Shrike-thrush	*Colluricincla harmonica*
Golden Whistler	*Pachycephala pectoralis*
Rufous Whistler	*Pachycephala rufiventris*
Olive-backed Oriole	*Oriolus sagittatus*
Black-faced Woodswallow	*Artamus cinereus*
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*
White-breasted Woodswallow	*Artamus leucoryn*

Common Name	*Scientific Name*
Masked Woodswallow	*Artamus personatus*
White-browed Woodswallow	*Artamus superciliosus*
Pied Butcherbird	*Cracticus nigrogularis*
Grey Butcherbird	*Cracticus torquatus*
Australian Magpie	*Gymnorhina tibicen*
Pied Currawong	*Strepera graculina*
Grey Fantail	*Rhipidura albiscapa*
Willie Wagtail	*Rhipidura leucophrys*
Rufous Fantail	*Rhipidura rufifrons*
Australian Raven	*Corvus coronoides*
Little Raven	*Corvus mellori*
Unidentified Corvid	*Corvus sp.*
Magpie-lark	*Grallina cyanoleuca*
Restless Flycatcher	*Myiagra inquieta*
White-winged Chough	*Corcorax melanorhamphos*
Apostlebird	*Struthidea cinerea*
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*
Jacky Winter	*Microeca fascinans*
Red-capped Robin	*Petroica goodenovii*
Flame Robin	*Petroica phoenicea*
Golden-headed Cisticola	*Cisticola exilis*
Australian Reed-Warbler	*Acrocephalus australis*
Brown Songlark	*Cincloramphus cruralis*
Rufous Songlark	*Cincloramphus mathewsi*
Little Grassbird	*Poodytes gramineus*
White-backed Swallow	*Cheramoeca leucosterna*
Welcome Swallow	*Hirundo neoxena*
Fairy Martin	*Petrochelidon ariel*

Common Name	*Scientific Name*
Tree Martin	*Petrochelidon nigricans*
Eurasian Blackbird *	*Turdus merula*
Common Myna *	*Acridotheres tristis*
Common Starling *	*Sturnus vulgaris*
Silvereye	*Zosterops lateralis*
Mistletoebird	*Dicaeum hirundinaceum*
Red-browed Finch	*Neochmia temporalis*
Diamond Firetail	*Stagonopleura guttata*
Zebra Finch	*Taeniopygia guttata*
House Sparrow *	*Passer domesticus*
Eurasian Tree Sparrow *	*Passer montanus*
Australian Pipit	*Anthus novaeseelandiae*
European Goldfinch *	*Carduelis carduelis*

Key

* Exotic

Appendix 4. Habitat requirements for locally-occurring threatened fauna species

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Licensed Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Entities in selected area [North: -35.30 West: 145.26 East: 145.75 South: -35.84] recorded since 01 Jan 2000 until 08 Feb 2024 returned a total of 843 records of 39 species.

Birds

Common name *Scientific name* Schedule listing	Preferred habitat	Comment
Magpie Goose *Anseranas semipalmata* BC Act, Sch. 2, Vul.	Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges.	No suitable natural habitat for species on site.
Blue-billed Duck *Oxyura australis* BC Act, Sch. 2, Vul.	Prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover.	No suitable natural habitat for species on site.
Freckled Duck *Stictonetta naevosa* BC Act, Sch. 2, Vul.	Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree.	No suitable natural habitat for species on site.
Australasian Bittern *Botaurus poiciloptilus* BC Act, Sch. 1, End. EPBC Act, E.	Inhabits wetlands that generally have permanent fresh water and dense vegetation of sedges, rushes and reeds.	No suitable natural habitat for species on site.
Spotted Harrier *Circus assimilis* BC Act Sch. 2, Vul.	Occurs in grassy open woodland including acacia and mallee remnants, inland riparian woodland, grassland. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.	Potential foraging habitat on site.

Common name *Scientific name* Schedule listing	Preferred habitat	Comment
White-bellied Sea-Eagle *Haliaeetus leucogaster* BC Act, Sch. 2, Vul.	Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh.	Potential Habitat available. Waterbody (Mcallister park and Mulwala Canal) is located approximately less than 1km away from site.
Little Eagle *Hieraaetus morphnoides* BC Act Sch. 2, Vul.	Occupies open Eucalypt forest, woodland or open woodland. She-oak or acacia woodlands and riparian woodlands are also used. Builds a stick nests in winter in tall living trees within remnant patches.	Potential foraging habitat on site.
Square-tailed Kite *Lophoictinia isura* BC Act, Sch. 2, Vul.	Inhabits coastal forest and woodlands. Most commonly associated with ridge and gully forests dominated by Woollybutt, Spotted Gum or Peppermint Gum.	Potential foraging habitat on site.
Black Falcon *Falco subniger* BC Act, Sch. 2, Vul.	The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly travelling hundreds of kilometres. They occur in many vegetation types.	Potential foraging habitat on site.
Brolga *Grus rubicunda* BC Act, Sch. 2, Vul.	Brolgas often feed in dry grassland or ploughed paddocks or even desert claypans, but are dependent on wetlands, especially shallow swamps, where they will forage with their head entirely submerged.	No suitable natural habitat for species on site.
Bush Stone-curlew *Burhinus grallarius* BC Act, Sch. 1, End.	Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber feeding on insects and small vertebrates, such as frogs, lizards and snakes.	No suitable natural habitat for species on site.
Plains-wanderer *Pedionomus torquatus* BC Act, Sch. 1, End. EPBC Act, CE.	Plains-wanderers live in semi-arid, lowland native grasslands that typically occur on hard red-brown soils. Preferred habitat of the Plains-wanderer typically comprises 50% bare ground, 10% fallen litter, and 40% herbs, forbs and grasses.	No suitable natural habitat for species on site.
Australian Painted Snipe *Rostratula australis* BC Act, Sch. 1, End. EPBC Act, E.	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.	No suitable natural habitat for species on site.

Common name *Scientific name* Schedule listing	Preferred habitat	Comment
Curlew Sandpiper *Calidris ferruginea* BC Act, Sch. 1, End. EPBC Act, CE.	Generally occupies littoral and estuarine habitats, and is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.	No suitable natural habitat for species on site.
Swift Parrot *Lathamus discolor* BC Act, Sch. 2, Vul. EPBC Act, CE.	Occurs in a variety of Eucalypt forests. Migrates from Tasmania to the mainland during the winter/autumn months to feed mostly on winter flowering Eucalypts.	Potential foraging habitat on site.
Blue-winged Parrot *Neophema chrysostoma* BC Act, Sch. 2, Vul. EPBC Act, V.	They tend to favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones. The species can also be seen in altered environments. Pairs or small parties of blue-winged parrots forage mainly near or on the ground for seeds of a wide range of native and introduced grasses, herbs and shrubs.	Potential foraging habitat on site.
Superb Parrot *Polytelis swainsonii* BC Act, Sch. 2, Vul. EPBC Act, V.	In the Riverina superb parrots nest in the hollows of large trees (dead or alive with entrance diameter of 6 cm or wider, and at least 3.5 m above the ground) mainly in tall riparian River Red Gum forest or woodland. On the South West Slopes and Southern Tablelands nest trees can be in open Box-Gum woodland or isolated living or dead paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box.	Potential foraging habitat on site.
Masked Owl *Tyto novaehollandiae* BC Act, Sch. 2, Vul.	Forests, open woodlands and farms with large trees, e.g. river red gums adjacent to cleared country.	Potential foraging habitat on site.

Common name *Scientific name* Schedule listing	Preferred habitat	Comment
Brown Treecreeper (eastern subspecies) *Climacteris picumnus victoriae* BC Act, Sch. 2, Vul.	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging.	Potential habitat on site.
Southern Whiteface *Aphelocephala leucopsis* BC Act, Sch. 2, Vul. EPBC Act, V.	Southern whitefaces live in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually in habitats dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains. They forage almost exclusively on the ground, favouring habitat with low tree densities and an herbaceous understorey litter cover.	Potential habitat on site.
White-fronted Chat *Epthianura albifrons* BC Act, Sch. 2, Vul.	Gregarious species, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground.	No suitable natural habitat for species on site.
Painted Honeyeater *Grantiella picta* BC Act, Sch. 2, Vul. EPBC Act, V.	Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*.	Not enough suitable foraging habitat for species on site.
Black-chinned Honeyeater (eastern subspecies) *Melithreptus gularis gularis* BC Act, Sch. 2, Vul.	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*E. albens*), Inland Grey Box (*E. microcarpa*), Yellow Box (*E. melliodora*), Blakely's Red Gum (*E. blakelyi*) and Forest Red Gum (*E. tereticornis*). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees.	Potential habitat on site.

Common name *Scientific name* Schedule listing	Preferred habitat	Comment
Grey-crowned Babbler (eastern subspecies) *Pomatostomus temporalis temporalis* BC Act, Sch. 2, Vul.	Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions.	Potential habitat on site.
Varied Sittella *Daphoenositta chrysoptera* BC Act Sch. 2, Vul.	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	Potential habitat on site.
Dusky Woodswallow *Artamus cyanopterus cyanopterus* BC Act Sch. 2, Vul.	Often reported in woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. It has also been recorded in shrublands and heathlands and various modified habitats, including regenerating forests; very occasionally in moist forests or rainforests.	Potential habitat on site.
South-eastern Hooded Robin *Melanodryas cucullata cucullata* BC Act, Sch. 1, End. EPBC Act, E.	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.	Potential habitat on site.
Scarlet Robin *Petroica boodang* BC Act, Sch. 2, Vul.	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat.	Potential habitat on site.
Flame Robin *Petroica phoenicea* BC Act Sch. 2, Vul.	In NSW it breeds in upland moist eucalypt forests and woodlands, often on ridges and slopes, in areas of open understorey. It migrates in winter to more open lowland habitats such as grassland with scattered trees and open woodland on the inland slopes and plains.	Potential habitat on site.
Diamond Firetail *Stagonopleura guttata* BC Act Sch. 2, Vul	Mostly inhabits grassy eucalypt woodlands, also occurring in open forest and riparian areas within these. Feeds exclusively on the ground, occurring in flocks between five to 40+ birds.	Potential habitat on site.

Mammals

Common name *Scientific name* Schedule listing	Preferred habitat	Comment
Koala *Phascolarctos cinereus* BC Act, Sch. 1, End. EPBC Act, E.	Eucalypt forests rich in Swamp Mahogany (E. robusta), Forest Red Gum (E. tereticornis), and Grey Gum (E. punctata).	Very unlikely to have habitat on site.
Squirrel Glider *Petaurus norfolcensis* BC Act, Sch. 2, Vul.	Inhabits dry sclerophyll forest and woodland. Requires abundant hollow-bearing trees and a mix of Eucalypts, acacias and Banksias. At least one floral species should flower heavily in the winter and one or more species of Eucalypts need to be smooth-barked.	Potential foraging habitat on site.

10.1 Likelihood of Occurrence

Factors determining the likelihood of occurrence for a particular species include:

Specific habitat requirements (e.g. aquatic, seasonal, tree hollows, rock outcrop, woody debris, etc),
Geological / edaphic (soil) characteristics,
Known distribution (records),
Climate.

Probability	Description
Unlikely (none)	No suitable habitat or connectivity to suitable habitat offsite. Not known from local area. Not detected on site.
Low	Low value suitable habitat (e.g. highly disturbed conditions; Small habitat/forage areas; High-level weed-invasion; Cleared with fragmented regrowth). Not known from local area. Not detected on site.
Moderate	Moderate value suitable habitat (e.g. Disturbed, weed-invaded; Foraging/roosting habitat present; Habitat corridor). Not detected on site.
High	High value suitable habitat (e.g. breeding/foraging/roosting habitat present; Low or nil weed presence; Habitat corridor). Not detected on site.
Known	Species known to occur within the site (e.g. breeding and foraging habitat; foraging habitat; Habitat corridor). Detected on or adjacent to the site.

Appendix 5. Habitat requirements for locally-occurring threatened plant species

Botanical name Conservation status	Habitat description	Suitable habitat on site
Sclerolaena napiformis BC Act, Sch. 1, End. EPBC Act, E.	Confined to remnant grassland habitats on clay-loam soils. Grows on level plains in tussock grassland of Austrostipa nodosa and Chloris truncata, in grey cracking clay to red-brown loamy clay. Sites are roadside travelling stock routes and reserves subject to sheep grazing.	No
Cullen parvum BC Act, Sch. 1, End.	In known populations in Victoria and NSW, plants are found in grassland, River Red Gum (*Eucalyptus camaldulensis*) Woodland or Box-Gum Woodland, sometimes on grazed land and usually on table drains or adjacent to drainage lines or watercourses, in areas with rainfall of between 450 and 700 mm.	No
Swainsona murrayana BC Act, Sch. 2, Vul. EPBC Act, V.	The species has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with Maireana species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated	No
Swainsona plagiotropis BC Act, Sch. 2, Vul. EPBC Act, V.	Grows on flat grassland and in heavy red soil, often on roadsides and especially in table drains. Soils are derived from quaternary sediments and are usually red-brown clay-loams. The species is absent from black low-lying soils. Recorded from roadsides, rail reserves, stock routes and areas of lightly grazed unimproved pasture comprising Austrodanthonia, Enteropogon acicularis and Austrostipa grassland communities.	No
Swainsona sericea BC Act, Sch. 2, Vul.	Found in Natural Temperate Grassland and Snow Gum Eucalyptus pauciflora Woodland on the Monaro. Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes.	No
Pilularia novae-hollandiae BC Act, Sch. 1, End.	Austral Pillwort grows in shallow swamps and waterways, often among grasses and sedges. It is most often recorded in drying mud as this is when it is most conspicuous.	No
Austrostipa wakoolica BC Act, Sch. 1, End. EPBC Act, E.	Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise.	No

Key

BC Act 2016:

Sch1 = Schedule 1: Endangered species

Part 1: endangered species

Part 2: endangered populations

Part 3: endangered ecological communities

Part 4: species presumed extinct

Sch2 = Schedule 2: Vulnerable species

EPBC Act 1999:

CE = Critically Endangered

E = Endangered

V = Vulnerable

EP = Endangered Population

ROTAP Codes

1 Known by one collection only

2 Geographic range in Australia < 100Km

3 Geographic range in Australia > 100Km

E Endangered

V Vulnerable

R Rare

X Extinct

K Poorly known

C Reserved

a > or = 1000 plants reserved

i < 1000 plants reserved

t Total known population reserved

- Reserved population size unknown

+ Overseas occurrence

Appendix 6. Matters of National Environmental Significance

Australian Government

Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

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

Report created: 01-Mar-2024

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	5
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	35
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	3
Commonwealth Heritage Places:	None
Listed Marine Species:	16
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

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

Appendix 7. Soil profile report 46049

NSW SOIL AND LAND INFORMATION SYSTEM

Soil Profile Report

SITE DETAILS

Site Location:	Profile 383
Profile Details:	Berriqin Bore Logs - WRD Survey (1004130), Profile 383, collected by Project Water Reforms on 01 March, 2001
Map Reference:	MGA Grid Reference: Zone 55, 370613E, 6054785N. 8026 BERRIGAN (1:100000) map sheet.
Physiography:	alluvial plain on alluvium lithology.
Vegetation/Land Use:	
Surface Condition:	
Erosion/Land Degradation:	
Soil Hydrology:	
Soil Type:	Incomplete
Base of observation:	
Profile Field Notes:	

SOIL DESCRIPTION

Layer 0

0.00 - 0.00 m

Layer 1

0.00 - 0.70 m	Texture:	medium clay
	Colour:	colour not recorded with no recorded mottles
	Soil fauna:	Activity is nil
	Cracks/Macropores:	Cracks are nil, macropores are nil

Layer 2

0.70 - 1.70 m	Texture:	light clay
	Colour:	colour not recorded with no recorded mottles
	Soil fauna:	Activity is nil
	Cracks/Macropores:	Cracks are nil, macropores are nil

Layer 3

1.70 - 3.30 m	Texture:	light clay
	Colour:	colour not recorded with no recorded mottles

	Soil fauna:	Activity is nil
	Cracks/Macropores:	Cracks are nil, macropores are nil
Layer 4		
3.30 - 4.30 m	Texture:	medium clay
	Colour:	colour not recorded with no recorded mottles
	Soil fauna:	Activity is nil
	Cracks/Macropores:	Cracks are nil, macropores are nil
	Layer Notes:	With Si

LABORATORY TESTS

None available

For information on laboratory test data and units of measure, please see: Soil survey standard test methods

Report generated on 01/03/2024 at 10:30 AM

To contact us, email: soils@environment.nsw.gov.au

Soil Profile Report 46049

Appendix 8. Company Profile

Abel Ecology has been in the biodiversity consulting business since 1991, starting in the Sydney Region, and progressively more state wide in New South Wales since 1998, and now also in Victoria. During this time extensive expertise has been gained with regard to Master Planning, Environmental Impact assessments including flora and fauna, bushfire reports, Vegetation Management Plans, Management of threatened species, Review of Environmental Factors, Species Impact Statements, Biodiversity Development Assessment Reports and as Expert Witness in the Land and Environment Court. We have done consultancy work for industrial and commercial developments, golf courses, civil engineering projects, tourist developments as well as residential and rural projects. This process has also generated many connections with relevant government departments and city councils in NSW. Our team consists of seven scientists and three administrative staff, plus casual assistants as required.

Licences

NPWS s132C Scientific licence number is SL100780.

NPWS GIS data licence number is CON95034.

NSW Dept of Primary Industries Secretary's Animal Care and Ethics Committee Approval: 18/575.

NSW Dept of Primary Industries Animal Research Authority. Accreditation No: 84207.

The Consultancy Team

Dr Danny Wotherspoon

BSc, DipEd, MA, PhD, Grad Dip Bushfire Protection,

MECA NSW, MEPLA, MNELA, MESA, MEIANZ, White card.

Danny has practised as an ecological and bushfire consultant since 1991. He is a consulting ecologist to private developers, State Government agencies and various City Councils on a regular basis, for development applications, government projects, and as expert witness in the NSW Land and Environment Court.

Danny's PhD researched fragmented vegetation and fauna habitat use. He has special expertise in fauna habitat use. Danny has presented invited papers at international conferences since 2001 in Australia, China, South Africa, Sri Lanka and Israel on his PhD and other research, including golf course habitat management. Danny's scientific papers have been published in both international and Australian academic journals.

Koala survey qualification Dr Danny Wotherspoon

Requirements of SEPP Koala habitat Protection 2021

Surveys Must be Carried Out by a Suitably Qualified Person.

This is taken to mean a person with:

Criterion	Dr Wotherspoon
A minimum undergraduate qualification in natural sciences, ecology, environmental management forestry or similar from a university and	BSc (zoology and ecology) PhD (animal ecology)
A minimum 3 years experience in environmental assessment including field identification of plant and animal species and habitat.	Ecological consultant since 1991 Certified Practicing Ecological Consultant (ECA NSW registration no. 1).

This includes having as a minimum the following experience in conducting koala surveys:

Criterion	Dr Wotherspoon
• Greater than 10 surveys	Many surveys over more than 20 years. LGAs include Hawkesbury, Campbelltown, Port Macquarie, Blue Mountains, Pittwater, Snowy Monaro etc.
• Experience in using the koala presence survey methods identified below	Yes. Training workshop AKF annual Conference Philip Island 1999. NSW LEC expert witness.
• Can accurately identify preferred koala use trees	Yes. Arborist expert witness, so experience in identifying trees.
• Can distinguish between koala faecal pellets and those from other species that may present similar characteristics	Yes. Training workshop AKF annual Conference Philip Island 1999. Museum collection of pellets held in our office.

The person's skills in koala survey should be demonstrable by relevant qualifications and the following:

Criterion	Dr Wotherspoon
• a history of experience in koala habitat / population assessments and associated survey methods and/or	Research paper published by Australian Koala Foundation (AKF) (1999). Paper presented AKF annual Conference Philip Island 1999 Wotherspoon, D, (2021, in press) Koala survey and the SEPP (Koala Habitat Protection) 2019. *Consulting Ecology*.
• a resume giving details of koala survey projects conducted over the previous 10 years including employers' names and periods of employment (where relevant).	Owner and founder of Abel Ecology P/L (previously Blue Mountain Wilderness Services P/L) since 1991.

Mark Mackinnon

B Env. Sci. (Hons); Grad. Dip. in Bushfire Protection
Bushfire Planning & Design (BPAD), Accredited Practitioner Level 3. Accreditation number 36395.
MEIANZ, White Card

Mark is a passionate and enthusiastic scientist who thrives in the field of natural resource management. Mark has worked for a number of inter-state government agencies and environmental consultancies. He has experience in threatened species, fire ecology, bushfire management, pest plant and animals, and landscape restoration. In particular, he specializes in ornithology and bushfire management. Mark has a number of specialized field-based skills including simple and complex tree climbing, working at heights, general firefighter departmental fire accreditation, venomous snake and reptile handling, immunization to handle bat species, and an A - class bird banding license with mist-net endorsement. Mark is also skilled in ArcGIS mapping, first-aid, four -wheel-driving.

Mark Sherring

BM, MAABR, Cert. Hort., Cert. Bush Regen, Cert. Rural Ops, White Card.

Member of the Australian Association of Bush Regenerators

Mark has extensive knowledge and experience of plant species in New South Wales. He has built up his expert knowledge on NSW native plant species over the many years that he has practised as a Botanist. He is regularly asked to contribute to the extensive (ongoing) flora surveys of the Sydney Basin and Blue Mountains carried out by the Royal Botanic Gardens, Sydney. Mark has extensive field survey experience, having worked for over ten years in various plant-related roles. His role in Abel Ecology is to provide expert advice on flora and on the full range of flora management issues encountered and in the design and management of environmental monitoring projects.

Nick Tong

BSc (Biology), MPhil (Ecology), Cert. III CLM
BAM Accredited Assessor (BAAS22012),
MECA NSW, Snr First Aid, White card.

Nicholas is an experienced ecologist with expertise in fauna, plant species identification, vegetation assessment and ecological restoration. In the last six years, he has been a consulting ecologist to private developers and large corporations, for a variety of projecting including State Significant Developments. Nick has extensive field work experience in Sydney, the Blue Mountains and Central West NSW. His Master's project investigated the impacts of exotic predators on herpetofauna in the arid zone. His role at Abel Ecology is to provide expert advice on fauna and the application of the Biodiversity Offset Scheme.

Emily Barbaro

BA, MPublishing, Grad. Cert. EnvSc, MEScM (enrolled).

Junior Ecologist

Emily has completed a Graduate Certificate in Environmental Science and is currently enrolled in a Masters of Environmental Science and Management. Emily has previously worked as a Bush Regenerator and has been volunteering with Bushcare for Blue Mountains City Council for the last three years. She is passionate about learning more about her local Blue Mountains flora and fauna.

Erin Parker

B Biodiversity and Conservation, Macquarie University.

Junior Ecologist and Administration Assistant

Erin has completed a Bachelor of Biodiversity and Conservation at Macquarie University. Erin has previously worked as a bush regeneration team member while completing her degree. There she was able to develop plant ID skills and understanding of the procedures of weed management and restoration. Erin has also taken part in a casual position assisting with threatened species surveys in the Central West of NSW. This involved various tasks including tree hollow surveys for Glossy Black Cockatoos, preparation for reptile surveys, spotlighting, harp trapping surveys of microbats, and Koala SAT plot surveys. Erin is passionate about furthering her knowledge on native Australian flora and fauna, their ecology and impacts.

Dr Stephanie Clark

B Sc (Hons), PhD

Stephanie has over 30 years experience in the collection, identification and taxonomy of marine, estuarine, freshwater and terrestrial molluscs. She has conducted numerous targeted surveys for endangered and threatened species (particularly land and freshwater molluscs) in both Australia and the United States. She is particularly interested in the systematics, taxonomy, morphology (external and internal), population and conservation genetics and conservation of molluscs particularly terrestrial (especially the Helicoidea) and freshwater (especially the Hydrobiidae and related families) groups.