



Transport  
for NSW

# Medlow Bath Upgrade Great Western Highway Biodiversity Assessment

May 2021



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May 2021

Prepared by RPS Australia East Pty Ltd  
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## Document history and status

Revision	Date	Description	By	Review	Approved
1	22/02/2021	Technical review	M Aitkens		
2	19/04/2021	Technical review	M Aitkens		
3	20/05/2021	Response to draft comments	M Aitkens		

## Executive summary

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Transport for NSW (TfNSW) is proposing to upgrade the Great Western Highway at Medlow Bath between Railway Parade and approximately 330m south of Bellevue Crescent (the Proposal). This upgrade is part of the Great Western Highway Duplication project between Katoomba and Lithgow which aims to provide a safer and more efficient link between Central West NSW and the Sydney Motorway Network for freight, tourist and general traffic.

A Review of Environmental Factors (REF) has been prepared to fulfil TfNSW's obligations under s.5.5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and s.5.7 in making decisions on the likely significance of any environmental impacts. This biodiversity assessment report (BAR) forms part of the REF prepared for the proposal and assesses the biodiversity impacts of the proposal to meet the requirements of the EP&A Act.

A field survey was undertaken within the study area over five days in 2020 (10 December 2020) to ground-truth the results of the background research and habitat assessment. The corridor field studies provide an inventory of terrestrial and aquatic flora and fauna (biodiversity) including a list of known and potential threatened communities, populations and species listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and / or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

### Existing Environment

The floristic composition, geological substrate and landscape position of native vegetation within the study area allowed for the identification of one plant community type (PCT) being PCT 1248 Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin Bioregion. This PCT occurs in two condition classes [i.e. moderate and poor] and does not form part of a listed threatened ecological community (TEC). The remainder of the study area were classified as highly disturbed roadside areas comprising mostly exotic grasses, herbs, shrubs and trees.

A background review and general surveys were conducted for threatened flora and fauna species listed under the BC Act and / or EPBC Act that were identified as having a potential of occurring within the study area. No threatened flora or fauna species were identified.

The study area does not comprise any areas classed as key fish habitat. No aquatic species nor critical habitat, as listed as threatened under the NSW *Fisheries Management Act 1994*, were identified.

### Potential Impact

The proposal footprint will result in the clearing of 0.34 ha of PCT 1248. The loss of vegetation will have a minor impact on the habitat of highly mobile threatened fauna species in the local including foraging habitat for species capable of utilizing roadside margins such as the Gang Gang Cockatoo (*Callocephalon fimbriatum*), Little Lorikeet (*Glossopsitta pusilla*), Scarlet Robin (*Petroica boodang*) and Varied Sittella (*Daphoenositta chrysoptera*).

### Impact Assessment

A test of significance was prepared in accordance with the BC Act (Section 7.3) and EPBC Act (Significant Impact Guidelines 1.1) for the identified impacts on affected threatened species and ecological communities. The assessment was based on the current proposal and has concluded that the proposal is not likely to have a significant impact on threatened biodiversity.

### Avoidance and mitigation

Avoidance measures were considered where possible to reduce impacts. The design utilised, where possible, areas of high disturbance in preference to native vegetation. Mitigation measures are proposed during the construction and operational phases to reduce the adverse impacts of the proposal. The Biodiversity Guidelines: Protecting and managing biodiversity of RTA projects (NSW Roads and Traffic Authority, 2011a) identify a range of mitigation techniques that will be applied to this proposal.

## Offsets

TfNSW is to provide biodiversity offsets for impacts that exceed the clearing thresholds described in the RMS Guideline for Biodiversity Offsets (2016). The native vegetation being cleared for the proposal does not exceed any of the clearing thresholds prescribed in the RMS Guideline for Biodiversity Offsets (2016). Therefore, biodiversity offsets and associated Biodiversity Offset Strategy (BOS) is not required for this proposal.

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## Glossary of terms for this template

### **Definitions**

Cumulative impact	The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Refer to Clause 228(2) of the EP&A Regulation 2000 for cumulative impact assessment requirements.
Direct impact	When the habitat of species and ecological communities and of individuals using the study area are directly affected by the proposal (OEH 2018)
Habitat	An area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community, including any biotic or abiotic component (OEH 2014).
Indirect impact	When proposal related activities affect species or ecological communities in a manner other than direct loss within the site (OEH 2018).
Matters of NES	A matter of national environmental significance (MNES) protected by a provision of Part 3 of the EPBC Act.
Mitchell landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000 (OEH 2014).
Mitigation	Action to reduce the severity of an impact. (OEH 2014).
Mitigation measure	Any measure that facilitates the safe movement of wildlife and/or prevents wildlife mortality.
Moderate / Good	A condition state used to describe native vegetation comprising elements of naturally occurring vegetation structure and floristics. Additional descriptors may be applied to further describe the condition state (e.g. poor (weedy) indicating compromised condition as a consequence of weed cover).
Population	All the individuals that interbreed within a given area.
Proposal area/ Proposal site	The area of land that is directly impacted on by a proposed Major Proposal that is assessed/ approved under the EP&A Act, including access roads, and areas used to store construction materials (OEH 2014).
Study area	The area directly affected by the development and any additional areas likely to be affected by the development, either directly or indirectly (OEH 2014).
Target species	A species that is the focus of a study or intended beneficiary of a conservation action or connectivity measure.

## **Abbreviations**

BAM-C	Biodiversity Assessment Method Calculator
BC Act	Biodiversity Conservation Act 2016
BOS	Biodiversity Offset Strategy
BVT	Biometric Vegetation Type
CEEC	Critically endangered ecological communities
CEMP	Construction Environmental Management Plan
DP&E	Department of Planning and Environment
DPI	Department of Primary Industries
EEC	Endangered ecological community
EIS	Environmental Impact Statement
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999 (Federal).
FBA	Framework for Biodiversity Assessment
FM Act	Fisheries Management Act 1994 (NSW)
GDE	Groundwater dependent ecosystems
IBRA	Interim Biogeographically Regionalisation of Australia
MNES	Matters of National Environmental Significance
OEH	Office of Environment and Heritage
PCT	Plant Community Type
REF	Review of Environmental Factors
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SIS	Species Impact Statement
TECs	Threatened Ecological Communities
TfNSW	Transport for New South Wales
TSC Act	Threatened Species Conservation Act 1995 (NSW).
TSPD	Threatened Species Profile Database
VIS	Vegetation information system



# 1 Introduction

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## 1.1 Proposal background

Transport for NSW (TfNSW) proposes to upgrade approximately 1.2 kilometres of the Great Western Highway at Medlow Bath between Railway Parade and approximately 330m south of Bellevue Crescent (the Proposal). This upgrade is part of the Great Western Highway Duplication project between Katoomba and Lithgow which aims to provide a safer and more efficient link between Central West NSW and the Sydney Motorway Network for freight, tourist and general traffic.

In addition to the road modifications, the Proposal will also improve active transport links and public transport accessibility.

The regional context of the proposal location is shown in **Figure 1.1**.

## 1.2 The proposal

Key features of the proposal would include:

- Construction of a four lane divided carriageway with consolidated access points at upgraded intersections including
  - Upgraded Bellevue Crescent intersection to include three way traffic signals for safe access/egress
  - Provision of a U-turn bay for traffic turning east bound to west bound at Bellevue Crescent
  - Right turn bay in east bound carriageway median for Hydro Majestic Hotel (no right turn egress)
  - Improvements on Railway Parade to formalise parking provisions, U-turns and commuter parking
- Construction of full depth highway pavement and associated local road, driveway, footpath, kerb and gutter reconstruction work within the proposal area
- Construction of a new pedestrian bridge that connects Railway Parade, Medlow Bath Station and new indented bus bays on both sides of the Highway in line with Transport Access Program requirements (See 3.1.1)
- Shared use (pedestrian/cyclist) path adjacent to westbound carriageway
- Retaining wall and traffic barrier construction adjacent to existing rail corridor
- Utility relocation and stormwater drainage upgrade as required over length of the project including water quality control measures in Railway Parade
- Provision of 6m raised landscaped median for trees protected with modified redirective kerb
- 

The proposal footprint, which is enclosed within the environmental study boundary, includes earthworks and vegetation clearing for operational and temporary ancillary facilities, is shown in **Figure 1.2**.

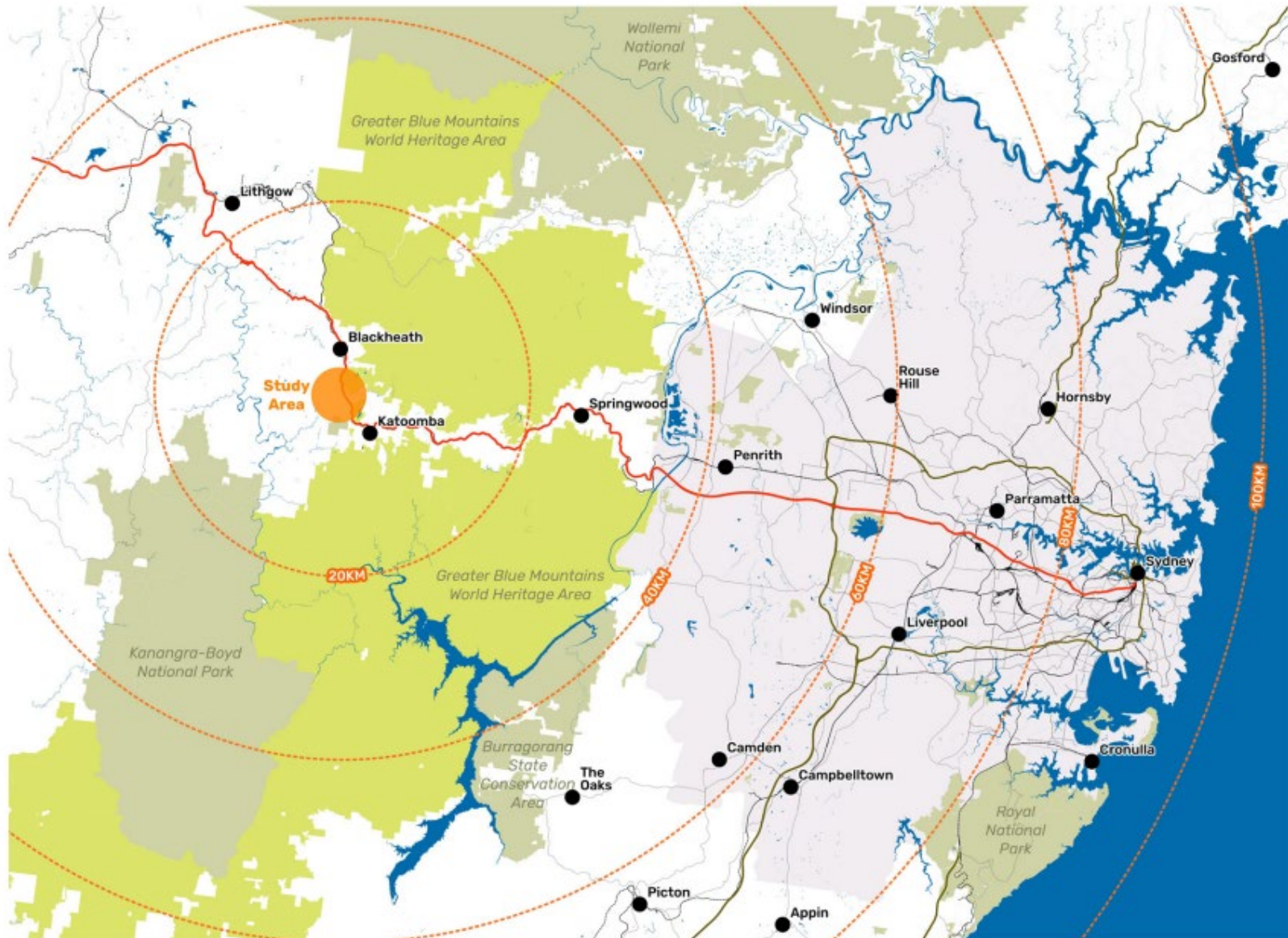
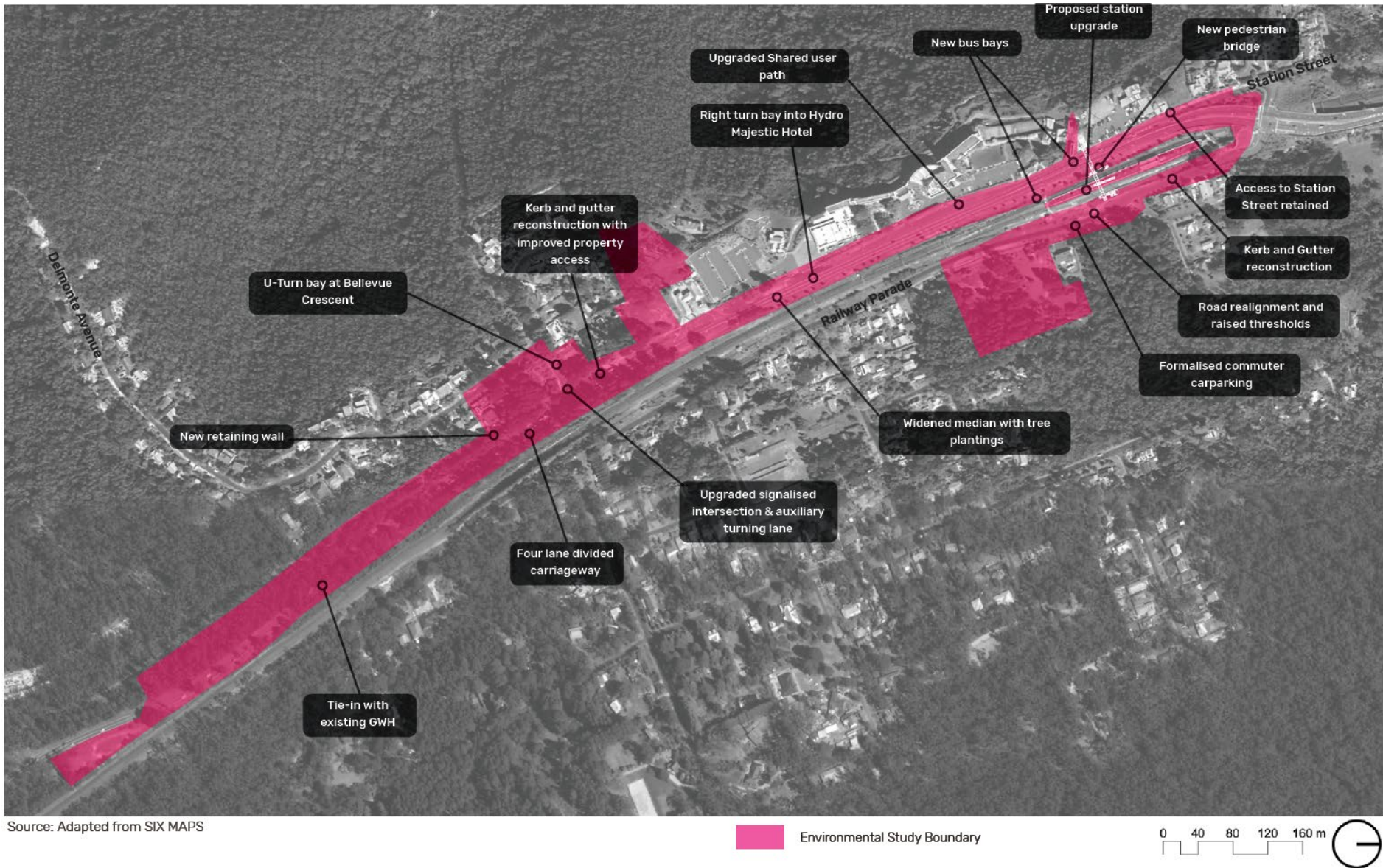


Figure 1.1: Proposal regional context



**Figure 1.2: The proposal**

### 1.3 Legislative context

A Review of Environmental Factors (REF) is prepared to satisfy TfNSW duties under s.5.5 of the EP&A Act to “examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity” and s.5.6 in making decisions on the likely significance of any environmental impacts. This biodiversity impact assessment forms part of the REF being prepared for the proposal, and assesses the biodiversity impacts of the proposal to meet the requirements of the EP&A Act.

Under s.5.5 of the EP&A Act, TfNSW must consider the effect of an activity on:

- Any wilderness area (within the meaning of the *Wilderness Act 1987*) in the locality
- Any joint management agreement entered into under the *Biodiversity Conservation Act 2016* (BC Act)
- Any conservation agreement entered into under Part 6 of the BC Act
- threatened species, populations and ecological communities, and their habitats and whether there is likely to be a significant effect
- A declared area of outstanding biodiversity value
- Any plan of management adopted under the *National Parks and Wildlife Act 1974* (NP&W Act) for the conservation area to which the agreement relates
- Any other protected fauna or protected native plants within the meaning of the NP&W Act.

Section 1.7 of the EP&A Act requires application of Part 7 of the BC Act and Part 7A of the *Fisheries Management Act 1994* for an activity subject to environmental impact assessment under Part 5 of the EP&A Act. Section 7.2 of the BC Act specifies the completion of a test in Section 7.3 of the BC Act for determining whether proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. Where a significant impact is likely to occur, the environmental impact statement under Part 5 of the EP&A Act is to include or be accompanied by a species impact statement (SIS) prepared in accordance with the Chief Executive Requirements or, if the proponent so elects, a biodiversity development assessment report.

In September 2015, a “strategic assessment” approval was granted by the Federal Minister in accordance with the EPBC Act. The approval applies to TfNSW activities being assessed under Part 5 (now Division 5.1) of the EP&A Act with respect to potential impacts on nationally listed threatened species, ecological communities and migratory species.

As a result, TfNSW proposals assessed via a REF:

- Must address and consider potential impacts on nationally listed threatened species, populations, ecological communities and migratory species, including application of the “avoid, minimise, mitigate and offset” hierarchy
- Do not require referral to the Federal Department of the Environment for these matters, even if the activity is likely to have a significant impact.

TfNSW must consider impacts to nationally listed threatened species, ecological communities and migratory species as part of the approval process under the strategic assessment. To assist with this, assessments are required in accordance with the *Matters of National Environmental Significance: Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999* (DoE 2013).

## 2 Methods

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### 2.1 Personnel

This report was written by Mark Aitkens (BSc) and reviewed by Hayden Beck (PhD) of RPS. Fieldwork was undertaken by Mark Aitkens.

### 2.2 Background research

Background research was undertaken to collect and review information on the presence or likelihood of occurrence of:

- Threatened and protected terrestrial and aquatic flora and fauna species and their habitat
- Threatened ecological communities
- Important habitat for migratory species
- Declared areas of outstanding biodiversity value.

Documents and spatial datasets reviewed to prepare this report include:

- Local vegetation mapping to identify plant community types (PCT) that may occur
- Current aerial photography
- Mitchell Landscapes (NPWS 2003)
- IBRA Region and subregion mapping (IBRA7)
- DPIE vegetation information system (VIS) database:  
<http://www.environment.nsw.gov.au/NSWVCA20PRapp/LoginPR.aspx> (accessed February 2021)
- NSW Vegetation Types Database:  
<http://www.environment.nsw.gov.au/projects/BiometricTool.htm> (accessed February 2021)
- The federal Bureau of Meteorology's Atlas of Groundwater Dependent Ecosystems (GDE):  
<http://www.bom.gov.au/water/groundwater/gde/map.shtml> (accessed December 2020)
- Department of Environment's directory of important wetlands:  
<http://www.environment.gov.au/cgi-bin/wetlands/search.pl?smode=DOIW> (accessed December 2020)
- Department of Planning's SEPP 14 wetlands spatial data:  
<http://www.planning.nsw.gov.au/spatial-data-download> (accessed December 2020)
- DPI's database for aquatic TECs: <http://www.dpi.nsw.gov.au/fisheries/species-protection/conservation/what-current> (accessed December 2020).

Information sources reviewed for a 10 kilometre radius of the proposal (hereafter referred to as the 'locality') include:

- Notional output from the BAM Credit Calculator using PCTs identified in Section 3
- Fauna and flora records contained in the Biodiversity Conservation Division (BCD) BioNet wildlife atlas (BCD 2021a; accessed February 2021)
- Fauna and flora records contained in the Department of the Environment and Energy (DoEE) Protected Matters Search tool (DoEE 2019; accessed February 2021)
- Habitat descriptions as provided by the online Threatened Species Profile Database (TSPD) (BCD 2021b; accessed February 2021)
- NSW Department of Primary Industries (DPI) Fisheries Fish Records Viewer:  
<http://www.dpi.nsw.gov.au/fisheries/species-protection/records/viewer> (accessed December 2020).

### 2.3 Habitat assessment

The list of threatened species and ecological communities (threatened biodiversity) identified by database searches (i.e. Section 2.2) were subject to a habitat assessment. Five 'likelihood of occurrence' categories were applied to these threatened biodiversity, which had regard for:

- Habitat descriptions as provided in the TSPD (BCD 2021b) and whether habitat features or components associated with the species occur within the proposal area
- Geographic distribution of the species is known or predicted
- The recency of threatened species observations (i.e. recent being less than five years) and proximity to the proposal area (i.e. landscape factors such as patch size and connectivity)
- Habitat value and condition as determined through the site inspection
- The results of targeted surveys (where performed)
- The likely effect of existing key threatening process (KTPs).

Analysis started with a preliminary desktop evaluation prior to study area inspection to guide the evaluation of habitat values within the proposal area. Following the field survey, the preliminary analysis was revised and updated following the evaluation of findings, thereby focusing the assessment on species and ecological communities relevant to the proposal.

The five likelihood of occurrence categories applied, with decreasing likelihood of occurrence, were 'known', 'high', 'moderate', 'low' and 'none' as described in **Table 2.1**

**Table 2.1: Likelihood of occurrence criteria**

Likelihood	Criteria
Recorded	The species was observed in the study area during the current survey
High	It is highly likely that a species inhabits the study area and is dependent on identified suitable habitat (ie. for breeding or important life cycle periods such as winter flowering resources), has been recorded recently in the locality (10km) and is known or likely to maintain resident populations in the study area. Also includes species known or likely to visit the study area during regular seasonal movements or migration.
Moderate	Potential habitat is present in the study area. Species unlikely to maintain sedentary populations, however may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on habitat within the study area, or habitat is in a modified or degraded state. Includes cryptic flowering flora species that were not seasonally targeted by surveys and that have not been recorded.
Low	It is unlikely that the species inhabits the study area. It may be an occasional visitor (fauna) and is not dependent on available habitat (ie. for breeding or important life cycle periods such as winter flowering resources) or for plants the site is sufficiently disturbed such that plant propagules are not likely to be present in the soil seed bank . Specific habitat is not present in the study area or the species are a non-cryptic perennial flora species that were specifically targeted by surveys and not recorded.
None	Suitable habitat is absent from the study area.

## 2.4 Field survey

A field inspection of the proposal area was undertaken by an RPS ecologist on 10 December 2020. This field work aimed at ground-truthing the results of the background research and habitat assessment. The field investigation involved:

- Vegetation plots to confirm vegetation classification and description (Section 2.4.1)
- Mapping of hollow bearing trees
- Habitat assessment for threatened species with a moderate or greater likelihood of occurrence (e.g. scats, scratches, dens/nests, whitewash, pellets, chewed cones, specialised foraging habitat)
- Assessment of extent and quality of amphibian habitat
- Targeted searches for listed threatened flora a moderate or greater likelihood of occurrence.

Details of the vegetation survey, targeted surveys and survey effort is provided in Sections 2.4.1 to 2.4.5.

### 2.4.1 Vegetation surveys

Native vegetation occurring in the study area was firstly identified by formation, class and Plant Community Type (PCT), as well as any corresponding Threatened Ecological Community, using Rapid Data Points (RDPs). Collected data was reviewed to assign both PCT and TEC (where applicable) using DPIE's Vegetation Integrity System (VIS) Classification Database.

Floristic plots were applied to measure the vegetation integrity of PCTs within the study area. This method involves estimating the vegetation composition, structure and function using 20 x 50 m floristic plots, in accordance with State of NSW (2020). Vegetation condition scores were then calculated using the BAM Calculator (DPIE 2021b; accessed February 2021; Version 22; hereafter BAM-C). Replicate plots were undertaken in accordance with the area each vegetation zone (a relatively homogenous area of native vegetation that is the same PCT and broad condition type; hereafter 'zone'), in accordance with the minimum survey effort prescribed by BAM (**Table 2.2**). Actual survey effort is summarised in **Table 2.2** (see Section 3 for more detail regarding PCTs) with survey locations shown in

**Table 2.2: Minimum number of transects/plots required per zone area (State of NSW 2020)**

Vegetation zone area (ha)	Minimum number of transects/plots
<2	1 plot/transect
> 2–5	2 plots/transects
> 5–20	3 plots/transects
> 20–50	4 plots/transects
> 50–100	5 plots/transects
> 100–250	6 plots/transects
> 250-1000	7 plots/transects; more plots may be needed if the condition of the vegetation is variable across the zone
> 1000	8 plots/transects; more plots may be needed if the condition of the vegetation is variable across the zone

### 2.4.2 Targeted flora surveys

Targeted surveys were completed for threatened flora as predicted by PCT. These searches were performed in a manner consistent with the 'parallel transect' method described in the NSW Guide to Surveying Threatened Plants (OEH 2020). The survey months with maximum likelihood of detecting the PCT predicted threatened flora, as informed by the BioNet database (BCD 2021a), is indicated in **Table 2.3**. Threatened species surveys were undertaken on 10 December 2020.





**Table 2.3: Survey months with maximum likelihood of detecting PCT Predicted Threatened Flora**

Species	J	F	M	A	M	J	J	A	S	O	N	D
<i>Acacia baueri</i> subsp. <i>aspera</i>												
Bynoe's Wattle <i>Acacia bynoeana</i>												
Flockton Wattle <i>Acacia flocktoniae</i>												
<i>Acacia meiantha</i>												
Thick-leaf Star-hair <i>Astrotricha crassifolia</i>												
Small Pale Grass-lily <i>Caesia parviflora</i> var. <i>minor</i>												
<i>Darwinia peduncularis</i>												
<i>Epacris hamiltonii</i>												
Capertee Stringybark <i>Eucalyptus cannonii</i>												
<i>Eucalyptus copulans</i>												
Blue Mountains Cliff Eyebright <i>Euphrasia bowdeniae</i>												
Evans Grevillea <i>Grevillea evansiana</i>												
<i>Hygrocybe anomala</i> var. <i>ianthinomarginata</i>												
<i>Hygrocybe aurantipes</i>												
<i>Hygrocybe reesiaae</i>												
Fletcher's Drumsticks <i>Isopogon fletcheri</i>												
Cabbage Kunzea <i>Kunzea cabbagei</i>												
<i>Leionema lachnaeoides</i>												
Rylstone Bell <i>Leionema sympetalum</i>												
Woronora Beard-heath <i>Leucopogon exolasius</i>												
Needle Geebung <i>Persoonia acerosa</i>												
<i>Persoonia hindii</i>												
Hairy Geebung <i>Persoonia hirsuta</i>												
Clandulla Geebung <i>Persoonia marginata</i>												
Wollemi Mint-bush <i>Prostanthera cryptandroides</i> subsp. <i>cryptandroides</i>												
Smooth Bush-Pea <i>Pultenaea glabra</i>												
<i>Pultenaea</i> sp. <i>Olinda</i>												
<i>Velleia perfoliata</i>												
<i>Veronica blakelyi</i>												
<i>Xanthosia scopulicola</i>												
Velvet Zieria <i>Zieria murphyi</i>												

In the case that the survey was insufficient to assess presence or absence of a species with moderate or greater likelihood of occurrence (that is not in accordance with the guidelines), then the species was presumed to occur.

A hand-held Trimble differential global positioning system (DGPS), accurate to less than one metre, was used to record the location of survey methodologies along with notable results including the location of threatened flora.

### 2.4.3 Targeted fauna surveys

Targeted surveys were completed for threatened fauna species identified as having a 'moderate or greater chance of occurring'. The survey months with maximum likelihood of detecting the PCT predicted threatened fauna, as informed by the BioNet database (BCD

2021a), is indicated in **Table 2.4** for 'species' and 'species/ ecosystem' classed species only. The BioNet dataset does not provide a survey timing specification for 'ecosystem' species.

**Table 2.4: Survey months with maximum likelihood of detecting PCT Predicted Threatened Fauna**

Species	J	F	M	A	M	J	J	A	S	O	N	D
Booroolong Frog <i>Litoria booroolongensis</i>												
Littlejohn's Tree Frog <i>Litoria littlejohni</i>												
Giant Burrowing Frog <i>Heleioporus australiacus</i>												
Red-crowned Toadlet <i>Pseudophryne australis</i>												
Broad-headed Snake <i>Hoplocephalus bungaroides</i>												
Blue Mountains Water Skink <i>Eulamprus leuraensis</i>												
Gang-gang Cockatoo <i>Callocephalon fimbriatum</i>												
Dusky Woodswallow <i>Artamus cyanopterus cyanopterus</i> <sup>1</sup>												
Varied Sittella <i>Daphoenositta chrysoptera</i> <sup>1</sup>												
Scarlet Robin <i>Petroica boodang</i> <sup>1</sup>												
Flame Robin <i>Petroica phoenicea</i> <sup>1</sup>												
Little Lorikeet <i>Glossopsitta pusilla</i> <sup>1</sup>												
Little Eagle <i>Hieraetus morphnoides</i>												
Barking Owl <i>Ninox connivens</i>												
Powerful Owl <i>Ninox strenua</i>												
Masked Owl <i>Tyto novaehollandiae</i>												
Eastern Pygmy-possum <i>Cercartetus nanus</i>												
Squirrel Glider <i>Petaurus norfolcensis</i>												
Greater Glider <i>Petauroides volans</i>												
Koala <i>Phascolarctos cinereus</i>												
Spotted-tailed Quoll <i>Dasyurus maculatus maculatus</i> <sup>1</sup>												
New Holland Mouse <i>Pseudomys novaehollandiae</i> <sup>1</sup>												
Southern Brown Bandicoot (eastern) <i>Isodon obesulus obesulus</i>												
Grey-headed Flying-fox <i>Pteropus poliocephalus</i>												
Little Bent-winged Bat <i>Miniopterus australis</i>												
Large-eared Pied Bat <i>Chalinolobus dwyeri</i>												
Large Bent-winged Bat <i>Miniopterus schreibersii oceanensis</i>												
Purple Copper Butterfly <i>Paralucia spinifera</i>												
Giant Dragonfly <i>Petalura gigantea</i>												

<sup>1</sup> Note: Ecosystem species with no corresponding survey timing specification

Threatened species surveys were undertaken 10 December 2020. Surveys were undertaken were guided by methods described in the Threatened Biodiversity Survey and Assessment Guidelines for Developments and Activities – Working Draft (DEC 2004) and the following (where relevant):

- Amphibians – Threatened species survey and assessment guidelines: field survey methods for fauna – Amphibians (2009) available on the OEH website <http://www.environment.nsw.gov.au/resources/threatenedspecies/09213amphibians.pdf>
- Threatened frogs – Survey Guidelines for Australia's Threatened Frogs, Commonwealth of Australia (2011), available on the Department of the Environment website <http://www.environment.gov.au/system/files/resources/ff3eb752-482d-417f-8971-f93a84211518/files/survey-guidelines-frogs.pdf>

- Green and Golden Bell Frog – Environmental Impact Assessment Guidelines for the Green and Golden Bell Frog (*Litoria aurea*) (2003) available on the OEH website <http://www.environment.nsw.gov.au/resources/nature/GAndGbellfrogEia0703.pdf> see also Department of the Environment website [http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\\_id=1870#survey\\_guidelines](http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1870#survey_guidelines)
- Threatened bats – Survey Guidelines for Australia’s Threatened Bats, Commonwealth of Australia (2010) available on the Department of the Environment website <http://www.environment.gov.au/epbc/publications/threatened-bats.html>
- Threatened birds – Survey Guidelines for Australia’s Threatened Birds, Commonwealth of Australia (2010), available on the Department of the Environment website <http://www.environment.gov.au/system/files/resources/107052eb-2041-45b9-9296-b5f514493ae0/files/survey-guidelines-birds.pdf>

Opportunistic sightings and secondary indications (scratches, scats, diggings, tracks etc.) of resident fauna were also noted. Indicators of fauna occupancy noted were:

- Distinctive scats left by mammals
- Scratch marks made by various types of arboreal animals
- Nests made by various guilds of birds
- Feeding scars on Eucalyptus trees made by gliders
- Whitewash, regurgitation pellets and prey remains from owls
- Aural recognition of bird and frog calls
- Skeletal material of vertebrate fauna
- Searches for indirect evidence of fauna (such as scats, nests, burrows, hollows, tracks, and diggings).

A hand-held Trimble differential global positioning system (DGPS), accurate to less than one metre, was used to record the location of survey methodologies along with notable results including the location of threatened fauna.

These surveys were coincident with the flora survey as shown in **Figure 2.1** with a summary of the survey effort is provided in **Section 2.4.5**.

#### 2.4.4 Aquatic Surveys

Where required, a waterway habitat assessment was prepared to characterise drainages within the study area and included through following measures:

- The ecosystem type (eg wetlands, floodplains, streams, estuaries, lakes)
- Dimensions of waterway and depth of water
- Flow characteristics and hydrological features of aquatic habitat, including changes to drainage and filtration and flow regime
- Bed substrate (eg rocks, coral, gravel, sand, mud)
- Habitat features (eg pools, riffles, billabongs, reefs)
- Existing infrastructure and barriers to fish movement (natural or artificial)
- Width and species composition of riparian vegetation including the type of vegetation present (eg macrophytes, snags, seaweeds, seagrasses, mangroves, saltmarsh) and condition
- Water quality (i.e. a snapshot using basic water quality indicators at the time of sampling including dissolved oxygen, pH, turbidity, temperature and conductivity).

These measures were used to determine if the waterways are a Class 1 or 2 watercourse (DPI 2013). If a waterway is a class 1 or 2 watercourse and the proposal is identified as having the potential for a significant impact on a threatened aquatic species or crosses ‘critical habitat’ then a more detailed assessment is required as outlined in the Aquatic Ecology section of the Environmental Impact Assessment (DP&I 2003) guideline.

#### 2.4.5 Summary of survey effort

Survey timing, personnel, locations, time of day and weather are summarised in **Table 2.5**.

**Table 2.5: Survey details**

Date	Personnel	Survey completed	Weather
10 December 2020	<ul style="list-style-type: none"> <li>Mark Aitkens</li> </ul>	<ul style="list-style-type: none"> <li>Threatened plants</li> <li>Diurnal Bird survey</li> <li>Habitat assessments</li> </ul>	<ul style="list-style-type: none"> <li>Min Temp 10.7°C</li> <li>Max Temp 23.5°C</li> <li>Max wind 37km/hr ENE</li> <li>Rain 0mm</li> </ul>

Locations of flora and fauna surveys are shown on **Figure 2.1**.

**Table 2.6: Targeted species survey details**

Species	Minimum survey requirements	Survey completed
Threatened Plants	<ul style="list-style-type: none"> <li>Searches were performed in accordance with the 'parallel transect' method described in the NSW Guide to Surveying Threatened Plants (OEH 2016). The prescribed survey timing for threatened flora surveys as detailed in the BioNet database (BCD 2021a).</li> </ul>	<ul style="list-style-type: none"> <li>Transect searches through suitable habitat</li> </ul>
Owls	<ul style="list-style-type: none"> <li>Broadcast (playback) surveys and spotlighting would be undertaken in habitat suitable for nocturnal forest owls. Detection would be made by a sighting or call</li> <li>Call Playback over five visits on different nights (DEC 2004)</li> </ul>	<ul style="list-style-type: none"> <li>Habitat assessment to determine availability of suitable roosting habitat</li> </ul>
Diurnal birds	<ul style="list-style-type: none"> <li>Area searches of suitable habitat for diurnal threatened birds would be undertaken during period when birds are known to be most active (DEWHA 2010)</li> <li>Detection would be made by a sighting or call</li> <li>Point/ area bird census over three days (DEC 2004)</li> <li>Each survey would comprise a point-based, 20-minute count of 0.79 ha (50 m radius) circular plots</li> </ul>	<ul style="list-style-type: none"> <li>Area searches of suitable habitat for diurnal threatened birds undertaken during dusk</li> <li>Detections made by a sightings and calls</li> <li>Point/ area bird census at seven locations</li> </ul>
Koala	<ul style="list-style-type: none"> <li>Koala Spot Assessment Technique (SAT) methodology, as described by Phillips and Callaghan (2011), would be used to survey for signs of presence of Koala within the site</li> </ul>	<ul style="list-style-type: none"> <li>Habitat assessment to determine availability of suitable feed trees</li> </ul>
Microbats	<ul style="list-style-type: none"> <li>Microbat echolocation calls would be recorded using Anabat Detector units set to remotely record for the entire night (~6pm to 6am) over four nights (DEWHA 2010a)</li> </ul>	<ul style="list-style-type: none"> <li>Habitat assessment to determine availability of suitable roosting habitat</li> </ul>
Grey Headed Flying Fox	<ul style="list-style-type: none"> <li>Walking transects and watching for flying bats and listening for their distinctive calls (DEWHA 2010a)</li> </ul>	<ul style="list-style-type: none"> <li>Signs of flying fox camps were searched for, including droppings, smell and deceased individuals</li> </ul>

Note: Surveys planned according to the following guidelines: DEC (2004) Threatened Biodiversity Survey and Assessment Guidelines for Developments and Activities – Working Draft; DECC (2009) Threatened species survey and assessment guidelines: field survey methods for fauna; DEWHA (2010) Survey Guidelines for Australia's Threatened Bats, Commonwealth of Australia; Phillips and Callaghan (2011) The Spot Assessment Technique: a tool for determining localised levels of habitat.

## 2.5 Limitations

### 2.5.1 Survey for certain PCT predicted species

Where a threatened plant was surveyed for outside the prescribed survey period, vegetative material was collected and sent to the National Herbarium of New South Wales to confirm species identification (where required). In the case that a species of moderate or greater likelihood of occurrence could not be surveyed for in its optimal detection period, the species was assumed to be present for the purposes of assessment. None of the threatened plant species had a moderate or greater likelihood of occurrence.

Surveys were undertaken outside the prescribed survey timing for the tree-hollow dependent species Glossy Black-Cockatoo (*Calyptorhynchus lathami*), Powerful Owl (*Ninox strenua*) and Masked Owl (*Tyto novaehollandiae*). In these cases, a habitat assessment was undertaken to identify potential tree-hollow habitat within the habitat tree assessment.

The precautionary principle was applied in the assessment of impacts for species that were not surveyed in the months with maximum likelihood of detection by assuming that these species may utilise any suitable habitat within the Study area (e.g. tree-hollows).

The December field survey was undertaken within the prescribed survey period for the Grey-headed Flying-fox (*Pteropus poliocephalus*; October to December). It was assumed that signs of a roost site would be obvious, including deceased individuals, smell and dropping, and hence sufficient evidence to identify a flying-fox camp site. Moreover, reference to a register of flying-fox camps (<http://sydneybats.org.au/flying-foxes/where-to-see-flying-foxes-in-sydney/>) was also referred to in order to confirm the presence/absence of a flying fox camp at the Study site.

### 3 Existing environment

The study area is in the Wollemi subregion of the Sydney Basin IBRA bioregion. The study area is mostly situated in the Blue Mountains Plateau Mitchell Soil landscape. The study area generally has a low relief with low undulating hills, with the landform elevation ranging from 1,150 to 1,160 m ASL.

The study area drains east into three creek catchments known as Adams, Young and Rocky Creeks and ultimately into the Grose Valley, which is more broadly a component of the Hawkesbury-Nepean Catchment. None of these streams transect the study area.

The study area typically comprises vegetation that is in a moderate to highly modified state, ranging from areas of bushland with edge effects apparent to fully cleared and managed roadside verges land and parklands. The best condition native vegetation is located along the western margin of the study area south of Bellevue Crescent, with higher condition vegetation and habitat occurring in this location.

Land zoning within the study area includes Roads and Rail Corridor (SP2), Special Activities (SP1) and Low Density Residential (R2). Land uses within the study area include:

- Rail line
- Roads
- Park land
- Accommodation
- Service centres
- Low density and residential.

#### 3.1 Plant community types

Native plant community types (PCTs) observed within the study area, as listed in **Table 3.1** and described thereafter, are shown in **Figure 3.1**.

**Table 3.1: Native Plant community types**

Plant community type (PCT)	Condition class	Threatened ecological community	Area (ha) in proposal area	Area (ha) in study area
PCT 1248 Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin Bioregion	Moderate	NA	0.34	1.87
	Poor		0.02	0.02
Total			0.36	1.89

Other forms of vegetation cover not consistent with a naturally occurring PCT that were observed on the study area and shown in **Figure 3.1** are listed below:

- 0.08 ha of native (landscaped)
- 1.06 ha of exotic (tree cover)
- 1.49 ha of exotic (groundcover).

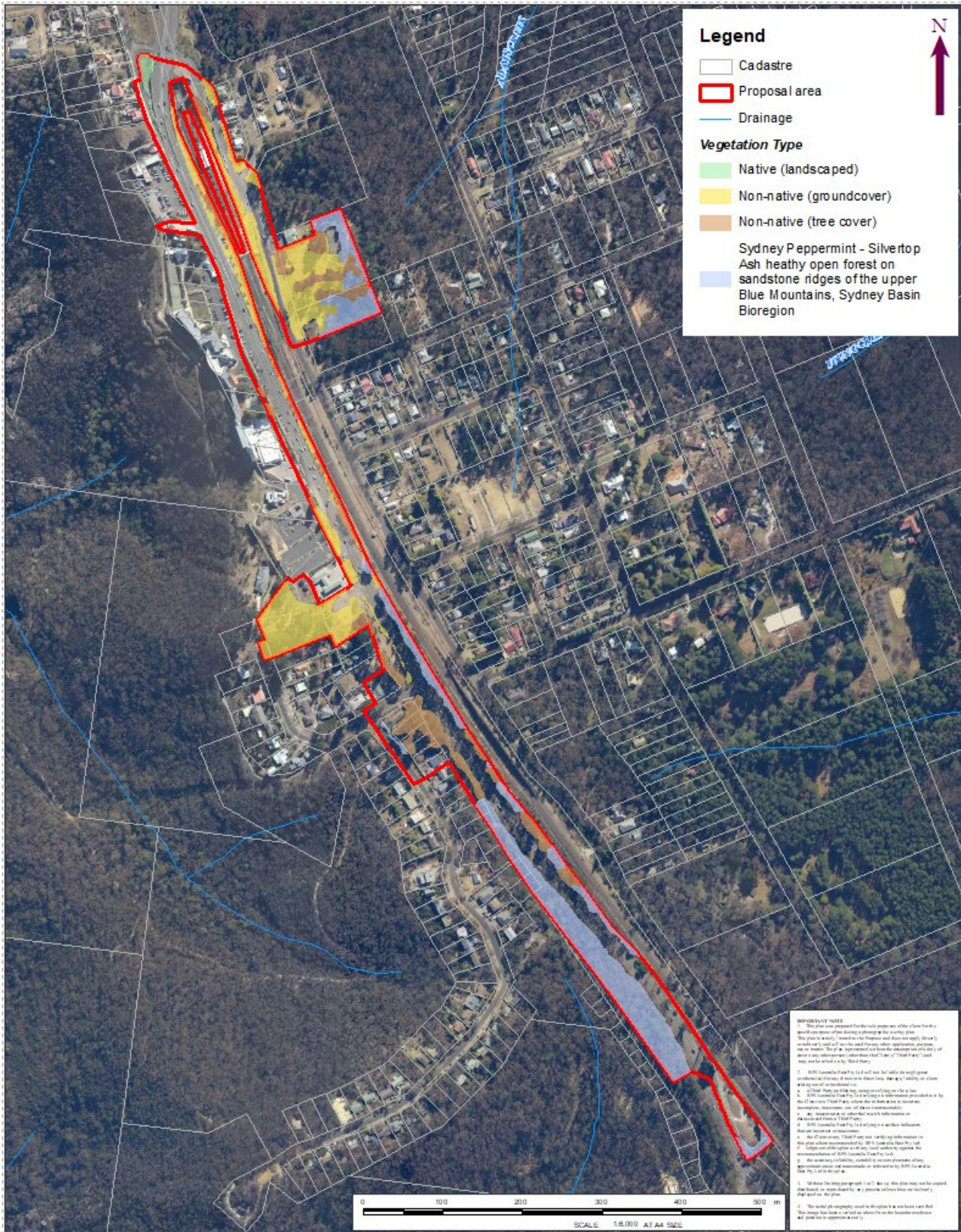


FIGURE 3.1: VEGETATION COVER

LOCATION:	MEDLOW BATH	DATA DATE:	20/02/2020
JOB NO.:	PR 144701-06	PROJECTION:	GDA2020 MGA Zone 58
PURPOSE:	ECOLOGY	DATA SOURCES:	RP's Client Land and Property 2020
Technician:	mark.atkins	Date:	20/05/2021

Figure 3.1: Vegetation cover

## Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin Bioregion

**Vegetation formation:** Dry Sclerophyll Forest (shrubby sub-formation)

**Vegetation class:** Sydney Montane Dry Sclerophyll Forests

**PCT:** 1248

**Common name:** Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin Bioregion

**Other mapping sources:**

**Conservation status:** N/A

**Estimate of percent cleared:** 20%

**Condition:** Moderate and Poor

**Extent in the study area:** 1.89 ha

**Table 3.2: Observed vegetation structure and typical species in PCT 1248**

Structure	Average height and height range (m)	Average cover and cover range	Typical species
Emergent Trees	25 - 30 m	10%	<i>Eucalyptus oreades</i>
Trees	20 m (10-25 m)	37.5% (30-45%)	<i>Eucalyptus radiata</i> , <i>Eucalyptus piperita</i> , <i>Eucalyptus blaxlandii</i>
Shrubs	1.5 m (1 – 5 m)	25% (10-50%)	<i>Hakea dactyloides</i> , <i>Leucopogon lanceolatus</i> , <i>Lomatia silaifolia</i> , <i>Persooni myrtilloides</i> and <i>Petrophile pulchella</i>
Ground covers	0.3 m (0.10 – 0.5 m)	30% (10-45%)	<i>Dianella caerulea</i> , <i>Dianella revoluta</i> , <i>Gonocarpus teucrioides</i> , <i>Goodenia bellidifolia</i> , <i>Joycea pallida</i> , <i>Lomandra filliformis</i> , <i>Lomandra glauca</i> , <i>Lomandra longifolia</i> , <i>Microlaena stipoides</i> , <i>Patersonia sericea</i> , <i>Phyllota squarrosa</i> , <i>Poa sieberiana</i> , <i>Poranthe microphylla</i>

### Description:

The moderate condition representations of this vegetation are described as dry sclerophyll forest characterised by several eucalypt species including the emergent Blue Mountains Ash (*Eucalyptus oreades*) (in the south of the study area) and Sydney Peppermint (*Eucalyptus piperita*), stringybark (*Eucalyptus blaxlandii*) and Narrow-leaved Peppermint (*Eucalyptus radiata*). 'Wildling' Radiata Pine (*Pinus radiata*) spasmodically occurs throughout. The multilayered midstory comprises shrubs dominated by Proteaceae (e.g. Geebung). Tussocky grasses (e.g. *Joycea pallida*) and graminoids such as lomandras, *Patersonia sericea* and *Dianella* spp. with herbs such as *Gonocarpus teucrioides*, *Goodenia bellidifolia* and *Poranthe microphylla*. Poor condition vegetation is lacking a tree canopy cover and midstorey as shown in Photograph 2. The modified vegetation is characterised by a much denser grass cover and fewer graminoids and herbs.





*Photograph 1: Sydney Peppermint - Silvertop Ash heathy open forest (moderate)*



*Photograph 2: Sydney Peppermint - Silvertop Ash heathy open forest (poor)*

## Native (landscaped)

Vegetation formation: N/A

Vegetation class: N/A

PCT: N/A

Common name: N/A

Other mapping sources: N/A

Conservation status: N/A

Estimate of percent cleared: N/A

Condition: poor

Extent in the study area: 0.08 ha

**Table 3.3: Observed vegetation structure and typical species for native (landscaped)**

Structure	Average height and height range (m)	Average cover and cover range	Typical species
Shrubs	1.5 m (1 – 2 m)	10%	
Ground covers	0.3 m (0.25 – 0.5 m)	80%	<i>Lomandra longifolia</i> , <i>Eragrostis curvula</i> *

**Description:** An area of prior road works has been landscaped with various native plant species. A mix of native and exotics were observed, with the assemblage not consistent with any naturally occurring PCTs. An example of this vegetation is shown in **Photograph 3**.



*Photograph 3: Native (landscaped)*

## Exotic (tree cover)

Vegetation formation: N/A

Vegetation class: N/A

PCT: N/A

Common name: N/A

Other mapping sources: N/A

Conservation status: N/A

Estimate of percent cleared: N/A

Condition: poor

Extent in the study area: 1.06 ha

**Table 3.4: Observed vegetation structure and typical species for exotic (tree cover)**

Structure	Average height and height range (m)	Average cover and cover range	Typical species
Trees	20 m (20-25 m)	50%	<i>Pinus radiata</i>
Shrubs	1.5 m (1 – 2 m)	10%	Cotoneaster
Ground covers	0.3 m (0.25 – 0.5 m)	10%	<i>Eragrostis curvula*</i> , <i>Holcus lanatus*</i>
Vines & climbers	0.5 m (0.25 – 0.75 m)	20%	<i>Lonicera japonica</i> , <i>Hedera helix</i>

**Description:** Roadside environments where historic plantings of Radiata Pine (*Pinus radiata\**) have persisted. A mix of native and exotics were observed in the understorey, with the assemblage not consistent with any naturally occurring PCTs. An example of this vegetation is shown in **Photograph 4**.



*Photograph 4: Exotic (tree cover)*

## Exotic (ground cover)

Vegetation formation: N/A

Vegetation class: N/A

PCT: N/A

Common name: N/A

Other mapping sources: N/A

Conservation status: N/A

Estimate of percent cleared: N/A

Condition: poor

Extent in the study area: 1.06 ha

**Table 3.5: Observed vegetation structure and typical species for exotic (groundcover)**

Structure	Average height and height range (m)	Average cover and cover range	Typical species
Trees	-	-	
Small trees	-	-	
Shrubs	-	-	
Ground covers	0.3 m (0.1 – 0.5 m)	80%	<i>Eragrostis curvula*</i> , <i>Holcus lanatus*</i>
Vines & climbers	-	-	

**Description:** Roadside environments where routine mechanical management practices prevail resulting in a well managed groundcover without a shrub or tree stratum. A mix of exotics grasses, graminoids and herbs were observed in the groundcover stratum, with the assemblage not consistent with any naturally occurring PCTs. An example of this vegetation is shown in **Photograph 5**.



*Photograph 5: Exotic (groundcover)*

## 3.2 Threatened ecological communities

No threatened ecological communities (TECs) were identified within the study area. The following State and Commonwealth listed TEC occurring outside and northeast of the study area:

- Temperate Highland Peat Swamp on Sandstone (THPSS) endangered ecological community (EEC).

The location of this TEC relative to the study area is shown **Figure 3.2**. This community provides unique habitat conditions for species such as the Blue Mountains Water Skink (*Eulamprus leuraensis*), Giant Dragonfly (*Petaleura gigantea*) and *Carex klaphecki*.

## 3.3 Groundwater dependent ecosystems

Groundwater Dependant Ecosystems (GDEs) are defined as (Serov et al. 2012):

‘Ecosystems which have their species composition and natural ecological processes wholly or partially determined by groundwater.’

Therefore, GDEs explicitly include any ecosystem that uses groundwater at any time or for any duration in order to maintain its composition and condition (Serov et al. 2012).

Kuginis et al. (2012) does not identify the study area to comprise vegetation identified as having high potential for groundwater dependency.

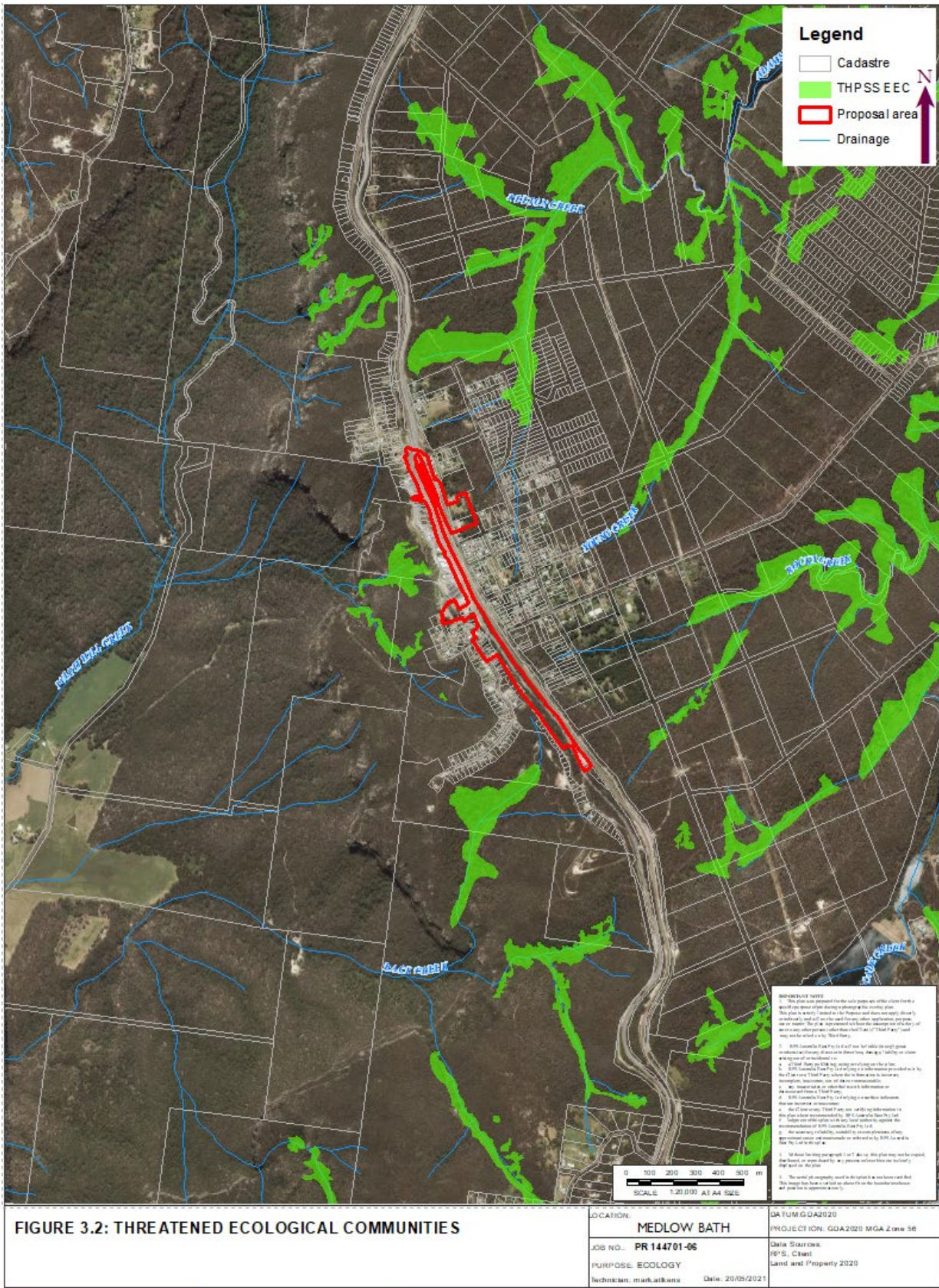


Figure 3.2: Threatened ecological communities

### 3.4 Threatened species and populations

**Table 3.6** lists the threatened species with a likelihood of occurrence of ‘moderate or greater’, as assessed in **Appendix B**.

**Table 3.6: State Listed Threatened species with ‘moderate’ or greater Likelihood of Occurrence**

Scientific name	Common Name	Status		Likelihood of occurrence
		BC Act	EPBC Act	
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog	V	V	Moderate
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	V	Moderate
<i>Pseudophryne australis</i>	Red-crowned Toadlet	V	-	Moderate
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V	-	Moderate
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	-	High
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	-	Moderate
<i>Petroica boodang</i>	Scarlet Robin	V	-	High
<i>Petroica phoenicea</i>	Flame Robin	V	-	Moderate
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	-	High
<i>Ninox connivens</i>	Barking Owl	V		Moderate
<i>Ninox strenua</i>	Powerful Owl	V	-	Moderate
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	-	High
<i>Dasyurus maculatus maculatus</i>	Spotted-tailed Quoll	V	E	Moderate
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot (eastern)	E	E	Moderate
<i>Phascolarctos cinereus</i>	Koala	V	V	Moderate
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	Moderate
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Moderate
<i>Miniopterus australis</i>	Little Bentwing-bat	V	-	Moderate
<i>Miniopterus schreibersii oceanensis</i>	Large Bent-winged Bat	V	-	Moderate
<i>Persoonia hirsuta</i>	Hairy Geebung	E	E	Moderate
<i>Persoonia marginata</i>		V		Moderate
<i>Zieria murphyi</i>		V		Moderate

None of the species listed in **Table 3.6** were observed during the field investigation.

#### 3.4.1 Aquatic environment

The study area contains no defined drainages that would classify as waterway habitat as described in Section 2.4.4.

### 3.5 Areas of outstanding biodiversity value

No areas of outstanding biodiversity value (AOBV) occur within or in the vicinity of the study area. AOBV would not be impacted by the proposal. AOBV have not been considered further in this assessment.

### 3.6 Wildlife connectivity corridors

The well vegetated upper Blue Mountains provides for relatively unconstrained wildlife connectivity in within the local area with local barriers to movement being limited to the developed parts of Medlow Bath and the Great Western Highway/ rail line corridors. These barriers are considered minor and of no regional consequence.

### 3.7 Matters of National Environmental Significance

**Table 3.7** lists the Commonwealth listed threatened and migratory species with a likelihood of occurrence of 'moderate or greater', as assessed in **Appendix B**.

**Table 3.7: Commonwealth listed Threatened and Migratory species with 'moderate' or greater Likelihood of Occurrence**

Scientific name	Common Name	Status		Likelihood of occurrence
		BC Act	EPBC Act	
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog	V	V	Moderate
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	V	Moderate
<i>Apus pacificus</i>	Fork-tailed Swift	-	M	Moderate
<i>Hirundapus caudacutus</i>	White-throated Needletail	-	M	Moderate
<i>Dasyurus maculatus maculatus</i>	Spotted-tailed Quoll	V	E	Moderate
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	-	V	Moderate
<i>Isodon obesulus obesulus</i>	Southern Brown Bandicoot (eastern)	E	E	Moderate
<i>Petauroides volans</i>	Greater Glider	-	V	Moderate
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	Moderate
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Moderate

None of the species listed in **Table 3.7** were observed during the field investigation. No EPBC listed wetlands of importance or threatened ecological communities were identified within the study area. As shown in Figure 3.2, one Commonwealth listed TEC is located 250-500m downstream of the Study area.



## 4 Impact assessment

### 4.1 Construction impacts

#### 4.1.1 Removal of native vegetation

The proposal is estimated to result in the clearing of 0.36 hectares of native vegetation consistent with a PCT classification. An additional 0.08 hectares of native (landscaped) vegetation will also be removed. A summary of the native vegetation loss by PCT classification is shown in **Table 4.1**.

**Table 4.1: Impacts on native vegetation**

Plant community type (PCT)	Status		Percent cleared <sup>1</sup>	Proposal area <sup>2</sup> (hectares)
	BC Act	EPBC Act		
1248 Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin Bioregion (moderate)	-	-	20	0.34
1248 Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin Bioregion (poor)	-	-	20	0.02
<b>Total</b>				<b>0.36</b>

1- Based on the VIS classification database.

2- Area to be cleared based on ground-truthed vegetation mapping within the study area.

#### 4.1.2 Removal of threatened ecological communities

No TECs are to be removed by the proposal.

#### 4.1.3 Removal of threatened fauna habitat

The potential habitat of threatened fauna species with a moderate or greater likelihood of occurrence to be removed by the proposal as outlined in **Table 4.2**.

**Table 4.2: Impacts on threatened fauna and potential habitat**

Threatened species	Ecosystem or species credit species	Status		Likelihood of occurrence	Potential Habitat to be impacted (ha)
		BC Act	EPBC Act		
Littlejohn's Tree Frog	Species	V	V	Moderate	0.36
Giant Burrowing Frog	Species	V	V	Moderate	0.36
Red-crowned Toadlet	Species	V	-	Moderate	0.36
Fork-tailed Swift	Ecosystem	-	M	Moderate	0.36
White-throated Needletail	Ecosystem	-	M	Moderate	0.36
Dusky Woodswallow	Ecosystem	V	-	Moderate	0.36
Gang-gang Cockatoo	Species	V	-	High	0.36
Varied Sittella	Ecosystem	V	-	Moderate	0.36
Scarlet Robin	Ecosystem	V	-	High	0.36
Flame Robin	Ecosystem	V	-	Moderate	0.36
Little Lorikeet	Species	V	-	High	0.36
Barking Owl	Species	V	-	Moderate	0.36
Powerful Owl	Ecosystem	V	-	Moderate	0.36
Eastern Pygmy-possum	Species	V	-	High	0.36
Spotted-tailed Quoll	Ecosystem	V	E	Moderate	0.36
New Holland Mouse	Ecosystem	-	V	Moderate	0.36

Threatened species	Ecosystem or species credit species	Status		Likelihood of occurrence	Potential Habitat to be impacted (ha)
		BC Act	EPBC Act		
Southern Brown Bandicoot (eastern)	Ecosystem	E	-	Moderate	0.36
Koala	Species	V	V	Moderate	0.36
Greater Glider	Ecosystem	-	V	Moderate	0.36
Grey-headed Flying-fox	Ecosystem	V	V	Moderate	0.36
Large-eared Pied Bat	Species	V	V	Moderate	0.36
Little Bentwing-bat	Ecosystem/ Species	V		Moderate	
Large Bent-winged Bat	Ecosystem/ Species	V		Moderate	

#### 4.1.4 Removal of threatened flora

The potential habitat of threatened flora species with a moderate or greater likelihood of occurrence to be removed by the proposal as outlined in **Table 4.2**.

**Table 4.3: Impacts on threatened flora and potential habitat**

Threatened species	Ecosystem or species credit species	Status		Likelihood of occurrence	Potential Habitat to be impacted (ha)
		BC Act	EPBC Act		
Hairy Geebung	Species	E	E	Moderate	0.36
<i>Persoonia marginata</i>	Species	V	V	Moderate	0.36
<i>Zieria murphyi</i>	Species	V	V	Moderate	0.36

#### 4.1.5 Removal of migratory species

The potential habitat of migratory species with a moderate or greater likelihood of occurrence to be removed by the proposal as outlined in **Table 4.4**.

**Table 4.4: Impacts on migratory species and potential habitat**

Threatened species	Ecosystem or species credit species	Status		Likelihood of occurrence	Potential Habitat to be impacted (ha)
		BC Act	EPBC Act		
Fork-tailed Swift	-	-	M	Moderate	0.36
White-throated Needle-tail	-	-	M	Moderate	0.36

#### 4.1.6 Aquatic impacts

Impacts to waterways and aquatic habitats may include:

- Temporary displacement of fauna
- Loss of riparian and aquatic habitat, including removal or relocation of snags
- Changes to flooding regimes, hydrology, turbidity and sedimentation
- Changed hydrology including excessive flow velocities, modified depths of waterways, increase water turbulence, in stream structures, realignment of creeks, alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands, and channelization, piping, concrete lining or scour protection of waterways
- Changes in shading regime and temperature.

No direct impact on aquatic habitat is expected. Changes to water quality and quantity may emerge in Adams Creek following redirection of overland flows into that drainage. Provided these flows are appropriately mitigated and managed measures it is considered that downstream impacts will be minor and inconsequential.

### 4.1.7 Injury and mortality

Fauna injury or death has the greatest potential to occur during construction when vegetation clearing would occur. The extent of this impact would be proportionate to the extent of vegetation that is cleared. Less mobile species (e.g. ground dwelling reptiles), or those that are nocturnal and nest or roost in trees during the day (e.g. arboreal mammals and microchiropteran bat species), may find it difficult to rapidly move away from the clearing when disturbed. The study area is known to contain several arboreal species such as birds that may be injured or killed during vegetation removal. Reptiles and frogs may also be injured or killed during construction as habitat is cleared.

Mitigation measures designed to reduce an injury and mortality of fauna are provided in **Section 5**.

## 4.2 Indirect/operational impacts

### 4.2.1 Wildlife connectivity and habitat fragmentation

Potential impacts to wildlife connectivity may occur where roads affect the movement of plants and animals between habitats. Wildlife connectivity issues include blocking fish passage, preventing migration of a species, decreasing the opportunity for dispersal or increasing roadkill. The proposal has been identified as having the following impacts on wildlife connectivity and habitat fragmentation:

- Loss of overhanging/ adjacent tree canopy and widening of existing tree canopy gaps.
- Barrier effects due to construction of new road and road widening.
- Edge effects.
- Genetic isolation.
- Life cycle requirements of species potentially impacted by the proposal.
- Changes to culverts and bridges resulting in wildlife connectivity impacts.
- The scale, frequency, intensity and duration of potential wildlife connectivity impacts including direct and indirect impacts and the difference between construction (temporary) and operational (long-term) impacts.
- Cumulative impacts on corridors and movement.

The proposal is mostly restricted to the existing urban parts of Medlow Bath and consequently will have no discernible impact on wildlife connectivity within the local area. Additional contributions to habitat fragmentation are minor and inconsequential. No adverse impacts on wildlife populations, key habitat resources, genetic interchange, and population viability for some species is expected.

### 4.2.2 Edge effects on adjacent native vegetation and habitat

The development of linear infrastructure is known to cause disturbance in terms of reducing habitat quality in adjacent areas. This is due to the greater potential for edge effects and habitat fragmentation and barrier effects due to the high perimeter to area ratio of linear developments. Edge effects typically take the form of weed invasion, increased light levels, increased wind speeds, and greater temperature fluctuations.

The proposal would be built in an area that is currently subject to a high level of edge effects from agricultural activity, the existing roadways and other development. The vegetation patches within the study area affected by high weed invasion and other edge effects along existing edges, typically extending 5-7 metres from the existing road formation and other clearings. There are likely to be additional edge effects resulting from the proposal as the new edges would typically be in areas only currently experiencing low to moderate weed invasion and other edge effects.

### 4.2.3 Invasion and spread of weeds

Proliferation of weed and pest species is an indirect impact (i.e. not a direct result of proposal activities). The most likely causes of weed dispersal and importation associated with the proposal include earthworks, movement of soil, and attachment of seed (and other propagules) to vehicles and machinery during all phases. The study area contains significant weed growth, in all areas, particularly on agricultural land and along minor roads and tracks. As such, the spread and proliferation of weeds must be managed during construction.

Mitigation measures designed to limit the spread and germination of weeds are provided in **Section 5**.

### 4.2.4 Invasion and spread of pests

Proposal activities have the potential to disperse pest species out of the proposal area across the surrounding landscape. Machinery entering the site are to be cleaned to remove plant propagules so as to limit the likelihood of importation into the Study area. The magnitude of this impact is likely to be low and mitigation measures are likely to be effective.

### 4.2.5 Invasion and spread of pathogens and disease

Several pathogens known from NSW have potential to impact on biodiversity as a result their movement and infection during construction. Of these, three are listed as a key threatening process under either the EPBC Act and/or BC Act including:

- Dieback caused by Phytophthora (Root Rot; EPBC Act and BC Act)
- Infection of frogs by amphibian chytrid fungus causing the disease chytridiomycosis (EPBC Act and BC Act)
- Introduction and establishment of exotic Rust Fungi of the order Pucciniales on plants of the family Myrtaceae (BC Act).

While these pathogens were not observed or tested for in the study area the potential for pathogens to occur should be treated as a risk during construction. The most likely causes of pathogen dispersal and importation associated with the proposal include earthworks, movement of soil, and attachment of plant matter to vehicles and machinery during all proposal phases (construction and operation). Pathogens would be managed within the proposal site according to the Biodiversity Guidelines: Protecting and managing biodiversity on TfNSW projects (NSW Roads and Traffic Authority, 2011b) (see **Section 5**).

### 4.2.6 Changes to hydrology

The proposal will involve the redirection of waters into Adams Creek thereby increasing water quantity and possible changes to water quality along this drainage. The proposal is likely to cause changes to affect the volume and peak runoff rates into waterways from the upstream catchments. Mott MacDonald (2021) made the following recommendations to minimise these impacts:

- Provide all runoff discharge locations with level spreaders for limits on the scour potential of runoff entering the existing watercourses
- Runoff discharge locations are proposed to have attenuation basins for mitigation of the discharge peak flows to no greater than under the existing conditions. Bioretention is proposed to be integrated into the basin floor to provide stormwater quality filtration and treatment.

Minor and inconsequential impacts on THPSS EEC located 250-500 m downstream of the proposal are predicted because of these works. No changes in ecosystem functionality and composition are expected.

### 4.2.7 Noise, light and vibration

The existing levels of noise and vibration from the existing Medlow Bath and other roads by vehicles are substantial, with the proposal unlikely to significantly increase noise and vibration

during operation of the road that would result in any increased impacts to biodiversity within the study area. There is however potential for impacts to fauna from noise and vibration during construction, which may result in fauna temporarily avoiding habitats adjacent to the construction. The magnitude of this impact would be low and mitigation measures are not deemed necessary.

Lighting would be used at night to enable work to be completed that may result in impacts to nocturnal fauna. Nocturnal species such as possums and microbats may avoid the habitat in the study area during construction as temporary 'daylight' conditions would be created by the mobile lighting system. This impact is considered temporary and would not have long lasting effects on the biodiversity of the study area. The magnitude of this impact would be low and mitigation measures are not deemed necessary. It has been assumed for the purposes of this assessment that permanent lighting would be installed in areas that are not currently lit.

#### 4.2.8 Groundwater dependent ecosystems

The proposal is not likely to have any direct impacts on groundwater dependant ecosystems. However, alteration to the hydrology of Adams Creek through the direction of increased flows into the watercourse may have an impact on THPSS EEC, which is a groundwater dependant ecosystem. Impacts to this TEC are likely to be minor and inconsequential as outlined in Section 4.2.6.

### 4.3 Cumulative impacts

The potential biodiversity impacts of the proposal must be considered as a consequence of the construction and operation of the proposal within the existing environment. The proposal would not act alone in causing impacts to biodiversity. The incremental effects of multiple sources of impact (past, present and future) are referred to as cumulative impacts and provide an opportunity to consider the proposal within a strategic context.

### 4.4 Assessments of significance

#### 4.4.1 Biodiversity Conservation Act 2016

The proposal has been assessed under Division 5.1 of the EP&A Act. Section 7.3 of the BC Act outlines the 'test of significance' that is to be undertaken to assess the likelihood of significant impact upon threatened species or ecological communities listed under the BC Act. The test of significance was conducted for threatened species that have been identified in **Table 3.5**.

These tests of significance have been undertaken in accordance with the guidelines provided in the Threatened Species Test of Significance Guidelines (OEH, 2018) which outlines a set of guidelines to help applicants/ proponents of a development or activity with interpreting and applying the factors of assessment.

The conclusions of the tests of significance assessments are summarised in **Table 4.5**. Full details of assessment of significance under the BC Act are presented in **Appendix C**.

**Table 4.5: Summary findings of the BC Act test of significance**

Threatened species, or communities	Test of Significance question <sup>1</sup>								Likely significant impact?
	a	b(i)	b(ii)	c(i) <sup>2</sup>	c(ii)	c(iii)	d	e	
Littlejohn's Tree Frog	N	X	X	0.32	N	L	N	N	No
Giant Burrowing Frog	N	X	X	0.32	N	L	N	N	No
Red-crowned Toadlet	N	X	X	0.32	N	L	N	N	No
Dusky Woodswallow	N	X	X	0.32	N	L	N	N	No

Threatened species, or communities	Test of Significance question <sup>1</sup>								Likely significant impact?
	a	b(i)	b(ii)	c(i) <sup>2</sup>	c(ii)	c(iii)	d	e	
Gang-gang Cockatoo	N	X	X	0.32	N	L	N	N	No
Varied Sittella	N	X	X	0.32	N	L	N	N	No
Scarlet Robin	N	X	X	0.32	N	L	N	N	No
Flame Robin	N	X	X	0.32	N	L	N	N	No
Little Lorikeet	N	X	X	0.32	N	L	N	N	No
Barking Owl	N	X	X	0.32	N	L	N	N	No
Powerful Owl	N	X	X	0.32	N	L	N	N	No
Eastern Pygmy-possum	N	X	X	0.32	N	L	N	N	No
Spotted-tailed Quoll	N	X	X	0.32	N	L	N	N	No
Southern Brown Bandicoot (eastern)	N	X	X	0.32	N	L	N	N	No
Koala	N	X	X	0.32	N	L	N	N	No
Grey-headed Flying-fox	N	X	X	0.32	N	L	N	N	No
Large-eared Pied Bat	N	X	X	0.32	N	L	N	N	No
Little Bentwing-bat	N	X	X	0.32	N	L	N	N	No
Large Bent-winged Bat	N	X	X	0.32	N	L	N	N	No
Hairy Geebung	N	X	X	0.32	N	L	N	N	No
<i>Persoonia marginata</i>	N	X	X	0.32	N	L	N	N	No
<i>Zieria murphyi</i>	N	X	X	0.32	N	L	N	N	No

Notes: Y= Yes (negative impact), N= No (no or positive impact), X= not applicable, L= Low, M= Moderate, H= High.

1. Test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats (Section 7.3 of the BC Act).
  - 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, or
    - (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.
2. Hectares (ha)

#### 4.4.2 Environment Protection and Biodiversity Conservation Act 1999

For threatened biodiversity listed under the EPBC Act, significance assessments have been completed in accordance with the EPBC Act Policy *Statement 1.1 Significant Impact Guidelines* (Department of Environment, 2013). Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment that is affected, and upon the intensity, duration, magnitude and geographic extent of the impacts

(Department of Environment, 2013). Importantly, for a 'significant impact' to be 'likely', it is not necessary for a significant impact to have a greater than 50 per cent chance of happening; it is sufficient if a significant impact on the environment is a real or not remote chance or possibility (Department of Environment, 2013). This advice has been considered while undertaking the assessments.

Full details of assessment of significance under the EPBC Act are presented in **Appendix C**. The conclusions of the assessment are provided in **Table 4.6**.

**Table 4.6: Summary findings of the EPBC Act significance assessments**

Threatened species	Significance Assessment Question <sup>1</sup>									Important Population? <sup>2</sup>	Likely significant impact?
	a	b	c	d	e	f	g	h	i		
Littlejohn's Tree Frog	N	N	N	N	N	N	N	N	N	No	No
Giant Burrowing Frog	N	N	N	N	N	N	N	N	N	No	No
Fork-tailed Swift	N	N	N	N	N	N	N	N	N	No	No
White-throated Needletail	N	N	N	N	N	N	N	N	N	No	No
Spotted-tailed Quoll	N	N	N	N	N	N	N	N	N	No	No
New Holland Mouse	N	N	N	N	N	N	N	N	N	No	No
Koala	N	N	N	N	N	N	N	N	N	No	No
Southern Brown Bandicoot (eastern)	N	N	N	N	N	N	N	N	N	No	No
Greater Glider	N	N	N	N	N	N	N	N	N	No	No
Grey-headed Flying-fox	N	N	N	N	N	N	N	N	N	No	No
Large-eared Pied Bat	N	N	N	N	N	N	N	N	N	No	No

1. Significance Assessment questions vary for endangered and vulnerable species as described below:

Endangered Species

- a. Lead to a long-term decrease in the size of a population
- b. Reduce the area of occupancy of the species
- c. Fragment an existing population into two or more populations
- d. Adversely affect habitat critical to the survival of a species
- e. Disrupt the breeding cycle of a population
- f. Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
- g. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species habitat
- h. Introduce disease that may cause the species to decline
- i. Interfere with the recovery of the species

Vulnerable Species

- a. Lead to a long-term decrease in the size of an important population
- b. Reduce the area of occupancy of an important population
- c. Fragment an existing important population into two or more populations
- d. Adversely affect habitat critical to the survival of the species
- e. Disrupt the breeding cycle of an important population
- f. Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
- g. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species habitat
- h. Introduce disease that may cause the species to decline
- i. Interferes substantially with the recovery of the species

Threatened Ecological Community

- a. Reduce the extent of an ecological community
- b. Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines
- c. Adversely affect habitat critical to the survival of an ecological community
- d. Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns
- e. Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular

- burning or flora or fauna harvesting
- f. Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:
  - a. Assisting invasive species, that are harmful to the listed ecological community, to become established, or
  - b. Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or
- g. Interfere with the recovery of an ecological community.

2. A 'population of a species' as determined by the *Environment Protection and Biodiversity Conservation Act 1999* is an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:

- a. A geographically distinct regional population, or collection of local populations, or a population, or collection of local populations, that occurs within a particular bioregion.

Important Population as determined by the *Environment Protection and Biodiversity Conservation Act 1999*, is one that for a vulnerable species:

- a. Is likely to be key source populations either for breeding or dispersal
- b. Is likely to be necessary for maintaining genetic diversity
- c. Is at or near the limit of the species range.

## 4.5 Impact summary

Potential impacts to biodiversity values are summarised in **Table 4.7**.





Impact	Biodiversity values	Nature of impact	Extent of impact	Duration	Does the proposal constitute or exacerbate a key threatening process?
Groundwater dependent ecosystems	THPSS EEC	Indirect - operational		Permanent	<ul style="list-style-type: none"> <li>Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands</li> </ul>
Changes to hydrology	THPSS EEC	indirect		Permanent	<ul style="list-style-type: none"> <li>Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands</li> </ul>
Noise, light and vibration	None of note	Indirect		Permanent	N/A

## 5 Avoid, minimise and mitigate impacts

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In managing biodiversity, TfNSW aims to achieve a balanced outcome, taking account of environmental considerations together with economic and community objectives. This includes a balanced approach to examining the particular environmental consequences of an activity, recognising that achieving an optimal outcome often requires compromise and decisions regarding environmental values. A key part of TfNSW's management of biodiversity for this proposal is the application of the 'avoid, minimise, mitigate and offset' hierarchy as follows:

1. Avoid and minimise impacts as the highest priority
2. Mitigate impacts where avoidance is not feasible or practicable in the particular circumstance
3. Offset where residual, significant unavoidable impacts would occur.

### 5.1 Avoidance and minimisation

Avoiding environmental impacts as the first step is consistent with the application of the precautionary principle. TfNSW's first priority is to avoid impacts to the environment. This can be achieved by early consideration of environmental issues from identification of constraints at proposal inception through to options analysis and selection of a preferred option, design investigation and assessment of the preferred option, detailed design, and implementation of on-ground safeguards during construction and operation and maintenance of the activity.

The primary method to avoid impacts is to locate activities away from areas of known or potential high biodiversity value and it is evident that the road alignment and bridge design has been located to avoid impacts to native vegetation. In identifying suitable work sites, the first preference is to locate existing cleared and disturbed areas that have good access, are not within immediate proximity to waterways, and that support good site management practices (for example, management of material stockpiles). Proposal compound sites have been proposed in highly disturbed areas to avoid impacts to biodiversity.

### 5.2 Mitigation measures

Once all practicable steps to avoid or minimise impacts have been implemented at the detailed design phase, mitigation measures would be implemented to lessen the potential ecological impacts of the proposal. Mitigation measures are to be undertaken during the construction and operational phases. The TfNSW guidelines and procedures identify a range of mitigation techniques to be applied, including managing the vegetation clearing process, reestablishment of native vegetation at the end of a project, weed management, provision of supplementary fauna habitat (such as nest boxes for appropriate species), and installation of erosion and sediment controls as appropriate.

The following mitigation measures as outlined in the Biodiversity Guidelines: Protecting and managing biodiversity of RTA projects (NSW Roads and Traffic Authority, 2011a) are recommended for implementation (see **Table 5.1**). The NSW DPI (Fisheries) document Policy and Guidelines for fish habitat conservation and management (2013 update) (NSW Department of Primary Industries, 2013) has also been used.

**Table 5.1: Mitigation measures**

Impact	Mitigation measures	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
Removal of native vegetation	Native vegetation removal will be minimised through detailed design.	Detailed design	Effective	No
	Pre-clearing surveys will be undertaken in accordance with <i>Guide 1: Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	Prior to construction	Effective	
	Vegetation removal will be undertaken in accordance with <i>Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	During construction	Effective	
	Native vegetation will be re-established in accordance with <i>Guide 3: Re-establishment of native vegetation of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	Post construction	Effective	
	The unexpected species find procedure is to be followed under <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011) if threatened ecological communities, not assessed in the biodiversity assessment, are identified in the proposal site.	During construction	Proven	
Removal of threatened species habitat and habitat features	Habitat removal will be minimised through detailed design.	Detailed design	Effective	No
	Habitat removal will be undertaken in accordance with <i>Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	During construction	Effective	
	Habitat will be replaced or re-instated in accordance with <i>Guide 5: Re-use of woody debris and bushrock</i> and <i>Guide 8: Nest boxes of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	During construction	Proven	
	The unexpected species find procedure is to be followed under <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011) if threatened fauna, not assessed in the biodiversity assessment, are identified in the proposal site.	During construction	Proven	
Removal of threatened plants	Pre-clearing surveys will be undertaken in accordance with <i>Guide 1: Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	During construction	Proven	No
	The unexpected species find procedure is to be followed under <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011) if	During construction	Proven	

Impact	Mitigation measures	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
	threatened flora species, not assessed in the biodiversity assessment, are identified in the proposal site.			
Aquatic impacts	Aquatic habitat will be protected in accordance with <i>Guide 10: Aquatic habitats and riparian zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011) and Section 3.3.2 <i>Standard precautions and mitigation measures of the Policy and guidelines for fish habitat conservation and management Update 2013</i> (DPI (Fisheries NSW) 2013).	During construction	Effective	Unlikely
Groundwater dependent ecosystems	Interruptions to water flows associated with groundwater dependent ecosystems will be minimised through detailed design.	Detailed design	Effective	Unlikely
Changes to hydrology	Changes to existing surface water flows will be minimised through detailed design.	Detailed design	Effective	Unlikely
Fragmentation of identified habitat corridors	Connectivity measures will be implemented in accordance with the <i>Wildlife Connectivity Guidelines for Road Projects</i> (RTA 2011).	Detailed design, during construction and post construction	Effective	No
Edge effects on adjacent native vegetation and habitat	Exclusion zones will be set up at the limit of clearing in accordance with <i>Guide 2: Exclusion zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	During construction	Effective	Unlikely
Injury and mortality of fauna	Fauna will be managed in accordance with <i>Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	During construction	Effective	Unlikely
Invasion and spread of weeds	Weed species will be managed in accordance with <i>Guide 6: Weed management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	During construction	Effective	Unlikely
Invasion and spread of pests	Pest species will be managed within the proposal site.	During construction	Effective	Unlikely
Invasion and spread of pathogens and disease	Pathogens will be managed in accordance with <i>Guide 2: Exclusion zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	During construction	Effective	Unlikely
Noise, light and vibration	Shading and artificial light impacts will be minimised through detailed design.	Detailed design	Effective	Unlikely

## **6 Offset strategy**

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### **6.1 Quantification of impacts**

Efforts made to avoid, minimise and mitigate potential ecological impacts from the proposal indicate that the proposal is not likely to have residual impacts of consequence. Unacceptable impacts on MNES would not occur and the EPBC Act environmental offsets policy does not apply.

### **6.2 Biodiversity Offset strategy**

The proposal is not likely to have a significant impact on threatened species, ecological communities and their habitats. Residual impacts are to be minimised and mitigated. A Biodiversity Offset Strategy (BOS) is not required for this proposal.

## 7 Conclusion

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### Vegetation

One PCT (PCT 1248) was identified in the study area based on floristic composition, geological substrate, and landscape position. This PCT occurs in a moderate and poor condition state. The remainder of the study area were classified as highly disturbed areas of exotic grassland and tree cover.

### Potential Impact

Based on the current design, the estimated clearing of native vegetation for the proposal as a whole is about 0.36 hectares. The loss of vegetation and habitat will not have a direct impact on threatened species, ecological communities and their habitats in the local area.

An assessment of significance was prepared in accordance with the BC Act (Section 7.3) and EPBC Act (Significant Impact Guidelines 1.1) for the identified impacts on affected threatened species and ecological communities. The assessment was based on the current proposal and has concluded that the proposal is not likely to have a significant impact on threatened biodiversity.

### Avoidance and mitigation

As there will be residual impacts to biodiversity, mitigation measures would need to be implemented during the construction and operational phases to further lessen the potential ecological impacts of the proposal. The Biodiversity Guidelines: Protecting and managing biodiversity of RTA projects (NSW Roads and Traffic Authority, 2011a) identify a range of mitigation techniques that will be applied to this proposal.

### Offsets

The proposal is not likely to have a significant impact on threatened species, ecological communities and their habitats. Residual impacts are to be minimised and mitigated. A Biodiversity Offset Strategy (BOS) is not required for this proposal.

## 8 References

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# Appendix A – Species recorded

## Recorded flora

Family	Scientific Name	Common name	Status	
			BC Act	EPBC Act
Apiaceae	<i>Centella asiatica</i>	Swamp Pennywort	-	-
Apiaceae	<i>Hydrocotyle laxiflora</i>	Stinking Pennywort	-	-
Apiaceae	<i>Hydrocotyle peduncularis</i>	Pennywort	-	-
Apiaceae	<i>Platysace linearifolia</i>	Narrow-leaved Platysace	-	-
Apiaceae	<i>Xanthosia pilosa</i>	Woolly Xanthosia	-	-
Asteraceae	<i>Cassinia aculeata</i>	Dolly Bush	-	-
Asteraceae	<i>Chrysocephalum apiculatum</i>	Common Everlasting	-	-
Asteraceae	<i>Coronidium scorpioides</i>	Button Everlasting	-	-
Asteraceae	<i>Hypochaeris radicata*</i>	Flatweed	-	-
Asteraceae	<i>Ozothamnus diosmifolius</i>	Ball Everlasting	-	-
Asteraceae	<i>Senecio spp.*</i>	Groundsel, Fireweed	-	-
Asteraceae	<i>Solenogyne bellioides</i>	-	-	-
Campanulaceae	<i>Wahlenbergia stricta subsp. stricta</i>	Austral Bluebell	-	-
Clusiaceae	<i>Hypericum gramineum</i>	Small St Johns Wort	-	-
Cyperaceae	<i>Caustis flexuosa</i>	Curly Wig	-	-
Cyperaceae	<i>Gahnia aspera</i>	Saw Sedge	-	-
Cyperaceae	<i>Gahnia filifolia</i>		-	-
Cyperaceae	<i>Lepidosperma laterale</i>	Variable Sword-sedge	-	-
Dennstaedtiaceae	<i>Pteridium esculentum</i>	Bracken	-	-
Dilleniaceae	<i>Hibbertia obtusifolia</i>	Grey Guinea Flower	-	-
Epacridaceae	<i>Astroloma humifusum</i>	Native Cranberry	-	-
Epacridaceae	<i>Brachyloma daphnoides</i>	Daphne Heath	-	-
Epacridaceae	<i>Leucopogon lanceolatus</i>	Lance-leaf Beard-heath	-	-
Epacridaceae	<i>Monotoca scoparia</i>	Prickly Broom-heath	-	-
Euphorbiaceae	<i>Amperea xiphioclada</i>		-	-
Euphorbiaceae	<i>Poranthera microphylla</i>	Small Poranthera	-	-
Fabaceae (Faboideae)	<i>Gompholobium uncinatum</i>	Red Wedge Pea	-	-
Fabaceae (Faboideae)	<i>Pultenaea canescens</i>		-	-
Fabaceae (Faboideae)	<i>Daviesia latifolia</i>	-	-	-
Fabaceae (Faboideae)	<i>Gompholobium grandiflorum</i>	Golden Glory Pea	-	-
Fabaceae (Faboideae)	<i>Gompholobium minus</i>	Dwarf Wedge-pea	-	-
Fabaceae (Faboideae)	<i>Hovea linearis</i>	-	-	-
Fabaceae (Faboideae)	<i>Mirbelia platylobioides</i>	-	-	-
Fabaceae (Faboideae)	<i>Mirbelia rubiifolia</i>	Heathy Mirbelia	-	-
Fabaceae (Faboideae)	<i>Phyllota squarrosa</i>	Dense Phyllota	-	-
Goodeniaceae	<i>Dampiera stricta</i>	Blue Dampiera	-	-
Goodeniaceae	<i>Goodenia bellidifolia</i>	Daisy-leaved Goodenia	-	-
Haloragaceae	<i>Gonocarpus tetragynus</i>	Poverty Raspwort	-	-
Haloragaceae	<i>Gonocarpus teucroides</i>	Raspwort	-	-
Iridaceae	<i>Patersonia glabrata</i>	Leafy Purple-flag	-	-
Iridaceae	<i>Patersonia longifolia</i>	Dwarf Purple Flag	-	-
Iridaceae	<i>Patersonia sericea</i>	Wild Iris	-	-
Lindsaeaceae	<i>Lindsaea linearis</i>	Screw Fern	-	-
Loganiaceae	<i>Mitrasacme polymorpha</i>	Mitrewort	-	-
Lomandraceae	<i>Lomandra filiformis</i>	Wattle Matt-rush	-	-
Lomandraceae	<i>Lomandra glauca</i>	Pale Mat-rush	-	-
Lomandraceae	<i>Lomandra longifolia</i>	Spiky-headed Mat-rush	-	-
Lomandraceae	<i>Lomandra multiflora subsp. multiflora</i>	Many-flowered Mat-rush	-	-
Myrtaceae	<i>Eucalyptus blaxlandii</i>	Blaxland's Stringybark	-	-
Myrtaceae	<i>Eucalyptus dalrympleana</i>	Mountain Gum	-	-
Myrtaceae	<i>Eucalyptus mannifera</i>	Brittle Gum	-	-

Family	Scientific Name	Common name	Status	
			BC Act	EPBC Act
Myrtaceae	<i>Eucalyptus oreades</i>	Blue Mountains Ash	-	-
Myrtaceae	<i>Eucalyptus radiata</i>	Narrow-leaved Peppermint	-	-
Myrtaceae	<i>Eucalyptus sieberi</i>	Silvertop Ash	-	-
Myrtaceae	<i>Kunzea ericoides</i>	Burgan	-	-
Myrtaceae	<i>Leptospermum polygalifolium</i>	Tantoon	-	-
Myrtaceae	<i>Leptospermum trinervium</i>	Slender Tea-tree	-	-
Orchidaceae	<i>Gastrodia sesamoides</i>	Potato Orchid	-	-
Oxalidaceae	<i>Oxalis perrenans</i>	Yellow-flowered Wood Sorrel	-	-
Phormiaceae	<i>Dianella caerulea</i>	Blue Flax-lily	-	-
Phormiaceae	<i>Dianella revoluta</i>	Blueberry Lily	-	-
Pittosporaceae	<i>Billardiera scandens</i>	Hairy Appleberry	-	-
Plantaginaceae	<i>Plantago spp.</i>	Plantain	-	-
Plantaginaceae	<i>Veronica spp.*</i>		-	-
Poaceae	<i>Austrodanthonia racemosa</i>	Wallaby Grass	-	-
Poaceae	<i>Austrostipa pubescens</i>	Tall Speargrass	-	-
Poaceae	<i>Cynodon dactylon</i>	Common Couch	-	-
Poaceae	<i>Echinopogon spp.</i>	A Hedgehog Grass	-	-
Poaceae	<i>Entolasia stricta</i>	Wiry Panic	-	-
Poaceae	<i>Microlaena stipoides</i>	Weeping Grass	-	-
Poaceae	<i>Poa seiberiana</i>	Tussock Grass	-	-
Poaceae	<i>Poa spp.*</i>		-	-
Poaceae	<i>Rytidosperma setaceum</i>		-	-
Proteaceae	<i>Banksia spinulosa</i>	Hairpin Banksia	-	-
Proteaceae	<i>Hakea dactyloides</i>	Broad-leaved Hakea	-	-
Proteaceae	<i>Isopogon anemonifolius</i>	Flat-leaved Drumsticks	-	-
Proteaceae	<i>Lomatia silaifolia</i>	Crinkle Bush	-	-
Proteaceae	<i>Petrophile pulchella</i>	Conesticks	-	-
Restionaceae	<i>Lepyrodia scariosa</i>	Scale Rush	-	-
Rubiaceae	<i>Pomax umbellata</i>	Pomax	-	-
Scrophulariaceae	<i>Veronica plebeia</i>	Creeping Speedwell	-	-
Stylidiaceae	<i>Stylidium graminifolium</i>	Grass Trigger Plant	-	-
Thymelaeaceae	<i>Pimelea linifolia</i>	Slender Rice Flower	-	-
Violaceae	<i>Hybanthus monopetalus</i>	Slender Violet	-	-
Violaceae	<i>Viola betonicifolia</i>	Native Violet	-	-
Violaceae	<i>Viola hederacea</i>	Ivy-leaved Violet	-	-
Xanthorrhoeaceae	<i>Xanthorrhoea spp.</i>		-	-

Note: HTW = High Threat Weed; WoNS = Weed of National Significance

## Recorded fauna

Taxa/Fauna group	Scientific Name	Common name	Status	
			BC Act	EPBC Act
Bird	<i>Acridotheres tristis</i>	Indian Myna	-	-
Bird	<i>Rhipidura leucophrys</i>	Willie Wagtail	-	-
Bird	<i>Gymnorhina tibicen</i>	Magpie	-	-
Bird	<i>Malurus cyaneus</i>	Superb Fairywren	-	-
Bird	<i>Spilopelia chinensis</i>	Spotted Dove	-	-
Bird	<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill	-	-
Bird	<i>Trichoglossus moluccanus</i>	Rainbow Lorikeet	-	-
Bird	<i>Corvus coronoides</i>	Australian Raven	-	-
Bird	<i>Grallina cyanoleuca</i>	Magpie Lark	-	-
Bird	<i>Strepera graculina</i>	Pied Currawong	-	-
Bird	<i>Cacatua galerita</i>	Sulphur crested Cockatoo	-	-
Bird	<i>Rhipidura albiscapa</i>	Grey Fantail	-	-
Bird	<i>Smicronis brevirostris</i>	Weebill	-	-
Bird	<i>Hirundo neoxena</i>	Welcome Swallow	-	-
Bird	<i>Elanus axillaris</i>	Black-shouldered Kite	-	-
Bird	<i>Sturnus vulgaris</i>	Starling	-	-
Bird	<i>Dacelo novaeguineae</i>	Kookaburra	-	-
Bird	<i>Cracticus torquatus</i>	Grey Butcherbird	-	-
Bird	<i>Eopsaltria australis</i>	Eastern Yellow Robin	-	-
Snail	<i>Helix aspersa</i>	Common Garden Snail	-	-

## Appendix B – Habitat assessment table

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Records (BCS 2021)	Likelihood of Occurrence
<i>Litoria booroolongensis</i> (Booroolong Frog)	E	E	The Booroolong Frog is found along permanent western flowing streams of the Great Dividing Range through most of NSW and down into northern Victoria. Streams range from small slow-flowing creeks to large rivers and the adults are found on or near cobble banks and other rock structures within stream margins and shelter under rocks or amongst vegetation near the ground on the stream edge. The species occurs along streams in both forested areas and open pasture, but has been affected by the presence of the introduced willow tree. Booroolong Frogs sometimes basks in the sun on exposed rocks near flowing water during summer.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Litoria littlejohni</i> (Littlejohn's Tree Frog)	V	V	Occurs in wet and dry sclerophyll forests and heathland associated with sandstone outcrops between 280 and 1000 m on the eastern slopes of the Great Dividing Range from the Central Coast down into Victoria. Individuals have been collected from a wide range of water bodies that includes semi-permanent dams, permanent ponds, temporary pools and permanent streams, with calling occurring from fringing vegetation or on the banks. Individuals have been observed sheltering under rocks on high exposed ridges during summer and within deep leaf litter adjacent to the breeding site. Calling occurs in all months of the year, often in association with heavy rains. The tadpoles are distinctive, being large and very dark in colouration.	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Not recently observed in the locality (NSW BioNet records).
<i>Heleioporus australiacus</i> (Giant Burrowing Frog)	V	V	The Giant Burrowing Frog has been recorded breeding in a range of water bodies associated with more sandy environments of the coast and adjacent ranges from the Sydney Basin south the eastern Victoria. It breeds in hanging swamps, perennial non-flooding creeks and occasionally permanent pools, but permanent water must be present to allow its large tadpoles time to reach metamorphosis.	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Records (BCS 2021)	Likelihood of Occurrence
					existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Not recently observed in the locality (NSW BioNet records).
<i>Mixophyes balbus</i> (Stuttering Frog)	E	V	Associated with streams in dry sclerophyll and wet sclerophyll forests and rainforests of more upland areas of the Great Dividing Range of NSW and down into Victoria. Breeding occurs along forest streams with permanent water where eggs are deposited within nests excavated in riffle zones by the females and the tadpoles swim free into the stream when large enough to do so. Outside of breeding, individuals range widely across the forest floor and can be found hundreds of metres from water	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Pseudophryne australis</i> (Red-crowned Toadlet)	V	-	Occurs on wetter ridge tops and upper slopes of sandstone formations on which the predominant vegetation is dry open forests and heaths. This species typically breeds within small ephemeral creeks that feed into larger semi-perennial streams. After rain these creeks are characterised by a series of shallow pools lined by dense grasses, ferns and low shrubs and usually contain leaf litter for shelter. Eggs are terrestrial and laid under litter, vegetation or rocks where the tadpoles inside will reach a relatively late stage of development before waiting for flooding waters before hatching will occur.	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Not recently observed in the locality (NSW BioNet records).
<i>Hoplocephalus bungaroides</i> (Broad-headed Snake)	E	V	Occurs almost exclusively in association with communities occurring on Triassic sandstone within the Sydney Basin. Typically found among exposed sandstone outcrops with vegetation types ranging from woodland to heath. Within these habitats they spend most of the year sheltering in and under rock crevices and exfoliating rock. However, some individuals will migrate to tree hollows to find shelter during hotter parts of summer.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Records (BCS 2021)	Likelihood of Occurrence
					active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).
<i>Aprasia parapulchella</i> (Pink-tailed Legless Lizard)	V	V	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by kangaroo grass. Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Eulamprus leuraensis</i> (Water skink)	E	E	The species is restricted to isolated and naturally fragmented habitats of permanent sedge and hanging swamps (these develop at moderate to high altitudes on sloping rock faces composed of Narrabeen sandstone which are subject to a constant supply of water), in open forest and open scrub or heath.	1	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)	V	M	Inhabits coastal and near coastal areas, building large stick nests, and feeding mostly on marine and estuarine fish and aquatic fauna.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Hieraetus morphnoides</i> (Little Eagle)	V	-	Most abundant in lightly timbered areas with open areas nearby. Often recorded foraging in grasslands, crops, treeless dune fields, and recently	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Records (BCS 2021)	Likelihood of Occurrence
			logged areas. May nest in farmland, woodland and forest in tall trees.		disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).
<i>Pandion cristatus</i> (Osprey)	V	-	Ospreys are found right around the Australian coast line, except for Victoria and Tasmania. They are common around the northern coast, especially on rocky shorelines, islands and reefs. The species is uncommon to rare or absent from closely settled parts of south-eastern Australia. Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Apus pacificus</i> (Fork-tailed Swift)	-	M	The Fork-tailed Swift is almost exclusively aerial, flying from less than one metre to at least 300 metres above ground and probably much higher.	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Not recently observed in the locality (NSW BioNet records).
<i>Hirundapus caudacutus</i> (White-throated Needletail)	-	M	An aerial species found in feeding concentrations over cities, hilltops and timbered ranges.	2	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Records (BCS 2021)	Likelihood of Occurrence
					grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Species recently observed in the locality (NSW BioNet records).
<i>Ardea alba</i> (Great Egret)	-	M	Great Egrets prefer shallow water, particularly when flowing, but may be seen on any watered area, including damp grasslands.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Ardea ibis</i> (Cattle Egret)	-	M	The Cattle Egret is found in grasslands, woodlands and wetlands, and is not common in arid areas. It also uses pastures and croplands, especially where drainage is poor.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Botaurus poiciloptilus</i> (Australasian Bittern)	E	E	The Australasian Bittern is widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes and spikerushes.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated



Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Records (BCS 2021)	Likelihood of Occurrence
					with habitat occupancy involving important lifecycle processes.
<i>Artamus cyanopterus cyanopterus</i> (Dusky Woodswallow)	V	-	The Dusky Woodswallow is widespread in eastern, southern and southwestern Australia. In New South Wales it is widespread from coast to inland, including the western slopes of the Great Dividing Range and farther west. It is sparsely scattered in, or largely absent from, much of the Upper Western region. The Dusky Woodswallow is 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. At sites where Dusky Woodswallows are recorded the understorey is typically open with sparse eucalypt saplings, acacias and other shrubs, including heath. The ground cover may consist of grasses, sedges or open ground, often with coarse woody debris (Higgins and Peter 2002). Birds are also often observed in farm land, usually at the edges of forest or woodland or in roadside remnants or wind breaks with dead timber.	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Not recently observed in the locality (NSW BioNet records).
<i>Callocephalon fimbriatum</i> (Gang-gang Cockatoo)	V	-	In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Also occur in subalpine snow gum woodland and occasionally in temperate or regenerating forest. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. It requires tree hollows in which to breed.	13	High. Habitat values within the investigation area are generally consistent with descriptions provided in the BCD TSPD. Habitat is likely to be located within the known 'extent of occurrence' and 'area of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are unlikely to adversely influence the capacity of the species to occupy the habitat. Pre-existing and active KTPs are unlikely to be substantially influencing species incidence and/ or habitat occupancy. Species recently observed in the locality (NSW BioNet records).
<i>Calyptorhynchus lathamii</i> (Glossy Black-Cockatoo)	V	-	Inhabits forest with low nutrients, characteristically with key <i>Allocasuarina</i> spp. Tends to prefer drier forest types with a middle stratum of <i>Allocasuarina</i> below <i>Eucalyptus</i> or <i>Angophora</i> . Often confined to remnant patches in hills and gullies. Breed in	1	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Records (BCS 2021)	Likelihood of Occurrence
			hollows stumps or limbs, either living or dead. Endangered population in the Riverina.		may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species recently observed in the locality (NSW BioNet records).
<i>Climacteris picumnus victoriae</i> (Brown Treecreeper (eastern subspecies))	V	-	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 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; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	1	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species recently observed in the locality (NSW BioNet records).
<i>Monarcha melanopsis</i> (Black-faced Monarch)	-	M	Found along the coast of eastern Australia, becoming less common further south. Inhabits rainforests, eucalypt woodlands, coastal scrub and damp gullies. It may be found in more open woodland when migrating.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Myiagra cyanoleuca</i> (Satin Flycatcher)	-	M	The Satin Flycatcher is found along the east coast of Australia from far northern Queensland to Tasmania, including south-eastern South Australia.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a

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			Found in tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests.		disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).
<i>Rhipidura rufifrons</i> (Rufous Fantail)	-	M	Found along the east coast of Australia from far northern Queensland to Tasmania, including south-eastern South Australia. Inhabits tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Falco hypoleucos</i> (Grey Falcon)	E	-	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Anthochaera phrygia</i> (Regent Honeyeater)	CE	E,M	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. The distribution of the species has contracted dramatically in the last 30 years to between north-	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but

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			eastern Victoria and south-eastern Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests.		may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).
<i>Grantiella picta</i> (Painted Honeyeater)	V	-	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits boree, brigalow and box-gum woodlands and box-ironbark forests.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).
<i>Merops ornatus</i> (Rainbow Bee-eater)	-	M	Found throughout mainland Australia most often in open forests, woodlands and shrublands, and cleared areas, usually near water. It will be found on farmland with remnant vegetation and in orchards and vineyards. It will use disturbed sites such as quarries, cuttings and mines to build its nesting tunnels.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Motacilla flava</i> (Yellow Wagtail)	-	MAR, MIG	Often seen near water. Listen for high-pitched, piercing call note. Common breeder on Arctic tundra from Alaska to Russia; found in grassy and	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area

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			waterside habitats in Southeast Asian wintering grounds and in migration.		is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Daphoenositta chrysoptera</i> (Varied Sittella)	V	-	Inhabits wide variety of dry eucalypt forests and woodlands, usually with either shrubby under storey or grassy ground cover or both, in all climatic zones of Australia. Usually in areas with rough-barked trees, such as stringybarks or ironbarks, but also in paperbarks or mature Eucalypts with hollows.	2	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Species recently observed in the locality (NSW BioNet records).
<i>Petroica boodang</i> (Scarlet Robin)	V	-	The Scarlet Robin is found from SE Queensland to SE South Australia and also in Tasmania and SW Western Australia. In NSW, it occurs from the coast to the inland slopes. The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs.	3	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Species recently observed in the locality (NSW BioNet records).
<i>Petroica phoenicea</i> (Flame Robin)	V	-	Flame Robins are found in a broad coastal band from southern Queensland to just west of the South Australian border. The species is also found in Tasmania. The preferred habitat in summer includes eucalyptus forests and woodland, whilst in winter prefers open woodlands and farmlands. It is considered migratory. The Flame Robin breeds from about August to January.	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality

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					may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Not recently observed in the locality (NSW BioNet records).
<i>Glossopsitta pusilla</i> (Little Lorikeet)	V	-	Distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range in NSW, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri. Mostly occur in dry, open eucalypt forests and woodlands. They feed primarily on nectar and pollen in the tree canopy. Nest hollows are located at heights of between 2 m and 15 m, mostly in living, smooth-barked eucalypts. Most breeding records come from the western slopes.	3	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Species recently observed in the locality (NSW BioNet records).
<i>Lathamus discolor</i> (Swift Parrot)	E	CE	The Swift Parrot occurs in woodlands and forests of NSW from May to August, where it feeds on eucalypt nectar, pollen and associated insects . The Swift Parrot is dependent on flowering resources across a wide range of habitats in its wintering grounds in NSW . This species is migratory, breeding in Tasmania and also nomadic, moving about in response to changing food availability.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Neophema pulchella</i> (Turquoise Parrot)	V	-	The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Nests in tree hollows, logs or posts, from August to December. It lays four or five white, rounded eggs on a nest of decayed wood dust.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use

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					of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).
<i>Rostratula australis</i> (Australian Painted Snipe)	E	E, M	In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes and Hexham Swamp. Most common in the Murray-Darling Basin. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Actitis hypoleucos</i> (Common Sandpiper)	-	M, MAR	Utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Calidris acuminata</i> (Sharp-tailed Sandpiper)	-	M	Freshwater or saltwater wetlands- the muddy edges of lagoons, swamps, lakes, dams, soaks, sewage dams or temporary floodwaters.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Calidris ferruginea</i> (Curlew Sandpiper)	E	-	The Curlew Sandpiper is distributed around most of the coastline of Australia. It occurs along the entire coast of NSW, particularly in the Hunter Estuary,	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are

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			and sometimes in freshwater wetlands in the Murray-Darling Basin. It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes the inland		absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Calidris melanotos</i> (Pectoral Sandpiper)	-	M	Tends to live and feed over shallow coastal waters-the estuaries, lagoons and channels around river and harbour entrances and along the shallows close in shore.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Gallinago hardwickii</i> (Latham's Snipe)	-	M	Latham's Snipe is a non-breeding migrant to the south east of Australia including Tasmania, passing through the north and New Guinea on passage. Latham's Snipe breed in Japan and on the east Asian mainland. seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. They are found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Numenius madagascariensis</i> (Eastern Curlew)	-	CE	The Eastern curlew spends its breeding season in northeastern Asia, including Siberia to Kamchatka, and Mongolia. Its breeding habitat is composed of marshy and swampy wetlands and lakeshores. Most individuals winter in coastal Australia, with a few heading to South Korea, Thailand, Philippines and New Zealand, where they stay at estuaries, beaches, and salt marshes. It uses its long, decurved bill to probe for invertebrates in the mud. It	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence



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			may feed in solitary but it generally congregates in large flocks to migrate or roost. Its call is a sharp, clear whistle, cuuue-reee, often repeated.		linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Tringa nebularia</i> (Common Greenshank)	-	M	Habitat is diverse, both inland and coastal. Found inland on both permanent and temporary wetland-billabongs, swamps, lakes, floodplains, sewage, farms and saltwater ponds. On the coast, it uses sheltered estuaries and bays with extensive mudflats, mangrove swamps, muddy shallows of harbours and lagoons and occasionally rocky tidal edges.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Ninox connivens</i> (Barking Owl)	V	-	Generally found in open forests, woodlands, swamp woodlands and dense scrub. Can also be found in the foothills and timber along watercourses in otherwise open country.	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Not recently observed in the locality (NSW BioNet records).
<i>Ninox strenua</i> (Powerful Owl)	V	-	Occupies wet and dry eucalypt forests and rainforests. Can occupy both un-logged and lightly logged forests as well as undisturbed forests where it usually roosts on the limbs of dense trees in gully areas. It is most commonly recorded within red turpentine in tall open forests and black she-oak within open forests. Large mature trees with hollows at least 0.5 m deep are required for nesting. Tree hollows are particularly important for the Powerful Owl because a large proportion of the diet is made up of hollow-dependent arboreal marsupials. Nest trees for this species are usually emergent with a diameter at breast height of at least 100 cm.	1	High. Habitat values within the investigation area are generally consistent with descriptions provided in the BCD TSPD. Habitat is likely to be located within the known 'extent of occurrence' and 'area of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are unlikely to adversely influence the capacity of the species to occupy the habitat. Pre-existing and active KTPs are unlikely to be substantially influencing species incidence and/ or habitat occupancy. Species recently observed in the locality (NSW BioNet records).

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<i>Tyto novaehollandiae</i> (Masked Owl)	V	-	Inhabits a diverse range of wooded habitat that provide tall or dense mature trees with hollows suitable for nesting and roosting. Mostly recorded in open forest and woodlands adjacent to cleared lands. Nest in hollows, in trunks and in near vertical spouts or large trees, usually living but sometimes dead. Nest hollows are usually located within dense forests or woodlands. Masked owls prey upon hollow-dependent arboreal marsupials, but terrestrial mammals make up the largest proportion of the diet.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).
<i>Tyto tenebricosa</i> (Sooty Owl)	V	-	Often found in tall old-growth forests, including temperate and subtropical rainforests. In NSW mostly found on escarpments with a mean altitude less than 500 metres. Nests and roosts in hollows of tall emergent trees, mainly eucalypts often located in gullies. Nests have been located in trees 125 to 161 centimetres in diameter.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).
<i>Cercartetus nanus</i> (Eastern Pygmy-possum)	V	-	Inhabits rainforest through to sclerophyll forest and tree heath. Banksias and myrtaceous shrubs and trees are a favoured food source. Will often nest in tree hollows, but can also construct its own nest. Because of its small size it is able to utilise a range of hollow sizes including very small hollows. Individuals will use a number of different hollows and an individual has been recorded using up to 9 nest sites within a 0.5ha area over a 5 month period.	1	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative

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					influence on species incidence and/ or habitat occupancy. Species recently observed in the locality (NSW BioNet records).
<i>Dasyurus maculatus maculatus</i> (Spotted-tailed Quoll)	V	E	Spotted-tailed Quoll are found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Queensland. Only in Tasmania is it still considered common. Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	4	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Species recently observed in the locality (NSW BioNet records).
<i>Petrogale penicillata</i> (Brush-tailed Rock-wallaby)	E	V	Found in rocky areas in a wide variety of habitats including rainforest gullies, wet and dry sclerophyll forest, open woodland and rocky outcrops in semi-arid country. Commonly sites have a northerly aspect with numerous ledges, caves and crevices.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).
<i>Micronomus norfolkensis</i> (Eastern Freetail-bat)	V	-	Most records are from dry eucalypt forests and woodlands to the east of the Great Dividing Range. Appears to roost in trees, but little is known of this species' habits.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated

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					with habitat occupancy involving important lifecycle processes.
<i>Pseudomys novaehollandiae</i> (New Holland Mouse)	-	V	The New Holland Mouse currently has a disjunct, fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Across the species' range the New Holland Mouse is known to inhabit open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes.	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Not recently observed in the locality (NSW BioNet records).
<i>Isodon obesulus obesulus</i> (Southern Brown Bandicoot (eastern))	E	E	Prefers sandy soils with scrubby vegetation and-or areas with low ground cover that are burn from time to time. A mosaic of post fire vegetation is important for this species.	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Not recently observed in the locality (NSW BioNet records).
<i>Petaurus australis</i> (Yellow-bellied Glider)	V	-	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria.	1	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species recently observed in the locality (NSW BioNet records).

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<i>Petaurus norfolcensis</i> (Squirrel Glider)	V	-	Generally occurs in dry sclerophyll forests and woodlands but is absent from dense coastal ranges in the southern part of its range . Requires abundant hollow bearing trees and a mix of eucalypts, banksias and acacias . There is only limited information available on den tree use by Squirrel gliders, but it has been observed using both living and dead trees as well as hollow stumps. Within a suitable vegetation community at least one species should flower heavily in winter and one species of eucalypt should be smooth barked. Endangered population in the Wagga Wagga LGA.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).
<i>Phascolarctos cinereus</i> (Koala)	V	V	Inhabits eucalypt forests and woodlands. The suitability of these forests for habitation depends on the size and species of trees present, soil nutrients, climate and rainfall .	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Not recently observed in the locality (NSW BioNet records).
<i>Petauroides volans</i> (Greater Glider)	-	V	The Greater Glider occurs in eucalypt forests and woodlands. Utilise tree hollows	3	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Species recently observed in the locality (NSW BioNet records).

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<i>Pteropus poliocephalus</i> (Grey-headed Flying- fox)	V	V	This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Bats commute daily to foraging areas, usually within 15 km of the day roost although some individuals may travel up to 70 km.	24	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Species recently observed in the locality (NSW BioNet records).
<i>Chalinolobus dwyeri</i> (Large-eared Pied Bat)	V	V	Located in a variety of drier habitats, including the dry sclerophyll forests and woodlands to the east and west of the Great Dividing Range. Can also be found on the edges of rainforests and in wet sclerophyll forests. This species roosts in caves and mines in groups of between 3 and 37 individuals.	1	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Species recently observed in the locality (NSW BioNet records).
<i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle)	V	-	Inhabit sclerophyll forests, preferring wet habitats where trees are more than 20 m high. Two observations have been made of roosts in stem holes of living eucalypts. There is debate about whether or not this species moves to lower altitudes during winter, or whether they remain sedentary but enter torpor. This species also appears to be highly mobile and records showing movements of up to 12 km between roosting and foraging sites.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).

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<i>Miniopterus australis</i> (Little Bentwing-bat)	V	-	Coastal north-eastern NSW and eastern Queensland. Little Bent-wing Bat is an insectivorous bat that roost in caves, in old mines, in tunnels, under bridges, or in similar structures. They breed in large aggregations in a small number of known caves and may travel 100s km from feeding home ranges to breeding sites. Little Bent-wing Bat has a preference for moist eucalypt forest, rainforest or dense coastal banksia scrub where it forages below the canopy for insects.	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Not recently observed in the locality (NSW BioNet records).
<i>Miniopterus orianae oceanensis</i> (Large Bent-winged Bat)	V	-	Eastern Bent-wing Bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young.	3	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Species recently observed in the locality (NSW BioNet records).
<i>Scoteanax rueppellii</i> (Greater Broad-nosed Bat)	V	-	Prefer moist gullies in mature coastal forests and rainforests, between the Great Dividing Range and the coast. They are only found at low altitudes below 500 m. In dense environments they utilise natural and human-made opening in the forest for flight paths. Creeks and small rivers are favoured foraging habitat. This species roosts in hollow tree trunks and branches.	1	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species recently observed in the locality (NSW BioNet records).

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<i>Macquaria australasica</i> (Macquarie Perch)	E (FM Act)	E	Macquarie perch are found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury and Shoalhaven. Macquarie perch are found in both river and lake habitats, especially the upper reaches of rivers and their tributaries	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Prototroctes maraena</i> (Australian Grayling)	-	V	Historically, this species occurred in coastal streams from the Grose River Valley, southwards through NSW, Vic. and Tas. It also occasionally occurred high upstream in the Snowy R. A single juvenile specimen was collected from Lake Macquarie in 1974. This species spends only part of its lifecycle in freshwater. The Tambo River population inhabits a clear, gravel-bottomed stream with alternating pools and riffles, and granite outcrops. It has also been associated with clear, gravel-bottomed habitats in the Mitchell & Wonnangatta Rivers but was present in a muddy-bottomed, heavily silted habitat in the Tarwin R.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Paralucia spinifera</i> (Bathurst Copper Butterfly)	E	V	The Copper Butterfly is only found in the Central Tablelands of NSW. Its habitat is restricted to elevations above 900 m where it feeds exclusively on a form of blackthorn. The butterfly's life cycle relies on a 'mutualistic' relationship with the ant <i>Anonychomyrma itinerans</i> , and on the presence of blackthorn ( <i>Bursaria spinosa</i> subsp. <i>lasiophylla</i> ).	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Petalura gigantea</i> (Giant Dragonfly)	E	-	The Giant Dragonfly is found along the east coast of NSW from the Victorian border to northern NSW. It is not found west of the Great Dividing Range. There are known occurrences in the Blue Mountains and Southern Highlands, in the Clarence River	1	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of



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			catchment, and on a few coastal swamps from north of Coffs Harbour to Nadgee in the south. Live in permanent swamps and bogs with some free water and open vegetation. Adults emerge from late October and are short-lived, surviving for one summer after emergence.		occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Caesia parviflora</i> var. <i>minor</i> (Small Pale Grass-lily)	E	-	Found in damp places in open forest on sandstone.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species not recently observed in the locality (NSW BioNet records).
<i>Xanthosia scopulicola</i>	V	-	Known only from scattered locations between Kings Tableland (Wentworth Falls) and Boars Head rock (west of Katoomba) in the Blue Mountains. Grows in cracks and crevices of sandstone cliff faces or on rocky outcrops above the cliffs.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Astrotricha crassifolia</i>	V	V	Occurs near Patonga (Gosford LGA), and in Royal NP and on the Woronora Plateau (Sutherland and Campbelltown LGAs). There is also a record from near Glen Davis (Lithgow LGA). Also in Victoria. Occurs in dry sclerophyll woodland on sandstone.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN

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					2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Cynanchum elegans</i> (White-flowered Wax Plant)	E	E	Recorded from rainforest gullies scrub and scree slopes from the Gloucester district to the Wollongong area and inland to Mt Dangar.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Xerochrysum palustre</i> (Swamp Everlasting)	-	V	Grows in swamps and bogs which are often dominated by heaths. Also grows at the edges of bog margins on peaty soils with a cover of shrubs or grasses. Sometimes grows in bogs with Sphagnum. Re-sprouts after fires.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Acrophyllum australe</i>	V	V	Restricted distribution, occurring from Faulconbridge to Lawson, South of Bilpin and near Kings Tableland, in the Blue Mountains area. Grows in sheltered gullies beneath waterfalls and drip zones of rock overhangs and cliff faces, usually with a south-east to south-west aspect. Typically found in areas where there is a more or less constant supply of water. Usually grows in shale interbeds at the base of small cliffs, in crevices on the sandstone rock face or on talus slopes. The rock overhangs are of Hawkesbury or Narrabeen Sandstone. Associated species commonly include <i>Callicoma serratifolia</i> , <i>Dracophyllum secundum</i> , <i>Todea</i>	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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			barbata, <i>Allania endlicheri</i> and <i>Blechnum ambiguum</i> . Found adjacent to open forest of <i>Eucalyptus piperita</i> and <i>Angophora costata</i> and closed forest of <i>Doryphora sassafras</i> and <i>Ceratopetalum apetalum</i> . Frequently growing on very thick layers of moss.		
<i>Carex klaphakei</i>	E	-	Found in only three locations, from the Blue Mountains (at Blackheath and Mt Werong) to the Southern Highlands (at Penrose). Grows with other native sedges and rushes in swamps on sandstone at altitudes of greater than 600 metres.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Lepidosperma evansianum</i>	V	-	The species is currently known from 3 locations (at Blackheath and Wentworth Falls), where it occurs in a very restricted habitat (cliff faces). It is recorded to be rare to occasional to common at these locations. It is difficult to assess the number of individuals at each location because of the rhizomatous habit of the species	8	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Epacris hamiltonii</i>	E	E	Occurs in the Blue Mountains, west of Sydney. Found at 72 sites within three creek catchments. The creeks occur in an altitude range of 810-940 metres a.s.l. and are all located on the northern side of the escarpment and flow into the Grose Valley. All known sites occur within a radius of approximately 5 km. Has a very specific habitat, being found on or adjacent to Narrabeen sandstone cliffs alongside perennial creeks, often below plateau hanging swamps. The soil generally has a spongy-peat-like consistency, with a very high moisture content. Sites are found at the sheltered	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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			base of cliffs adjacent to wet gully or swamp vegetation, usually where a perennial or virtually perennial source of water, such as cliff seepages, is present.		
<i>Leucopogon exolasius</i> (Woronora Beard-heath)	V	V	Grows in woodland on sandstone. Restricted to the Woronora and Grose Rivers and Stokes Creek, Royal National Park.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Acacia baueri</i> subsp. <i>aspera</i>	V	-	Occurs in low, damp heathlands, often on exposed rocky outcrops over a wide range of climatic and topographical conditions. Appears to prefer open conditions; rarely observed where there is any shrub or tree canopy development; and many of the observations of this species have been made following fire, suggesting the species prefers early successional habitats. Restricted to the Sydney region, occurring on the Kings Tableland in the central Blue Mountains and with sporadic occurrences on the Woronora Plateau in the Royal National Park, Mt. Keira district and at Wedderburn. May also occur on the escarpment-Woronora Plateau in the Flat Rock Junction and Stanwell Tops area of the Illawarra.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Acacia bynoeana</i> (Bynoe's Wattle)	E	V	Grows mainly in heath and dry sclerophyll forest in sandy soils. Mainly south of Dora Creek-Morrisset area to Berrima and the Illawarra region, west to the Blue Mountains, also recorded from near Kurri Kurri in the Hunter Valley and from Morton National Park.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low

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					and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species not recently observed in the locality (NSW BioNet records).
<i>Acacia flocktoniae</i> (Flockton Wattle)	V	V	Grows in dry sclerophyll forest on sandstone.	298	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species recently observed in the locality (NSW BioNet records).
<i>Acacia meiantha</i>	E	E	The Clarence population occurs in open eucalypt forest in association with <i>E. dives</i> and <i>E. sieberi</i> and in an adjacent area of mostly shrubs where the tree overstorey was cleared for powerlines; it is found on sandy soil over sandstone at approx. 1000 m elevation.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species not recently observed in the locality (NSW BioNet records).
<i>Pultenaea glabra</i>	V	V	Grows in swamp margins, hillslopes, gullies and creekbanks and occurs within dry sclerophyll forest and tall damp heath on sandstone. Restricted to the higher Blue Mountains.	1	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be

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					located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species recently observed in the locality (NSW BioNet records).
<i>Pultenaea</i> sp. Olinda	E	-	Has been found only in a very limited area of pagoda rock formation east of Rylstone.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Velleia perfoliata</i>	V	V	The species is only known from the Hawkesbury District and Upper Hunter Valley in the Central Coast botanical subdivision of NSW. <i>Velleia perfoliata</i> grows in heath on shallow sandy soil over Sandstone. It is currently known to exist in 9 populations. Five of these populations are reserved whilst a further population is partly reserved. Four of the reserved sites are situated adjacent to fire trails.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species not recently observed in the locality (NSW BioNet records).
<i>Haloragis exalata</i> subsp. <i>exalata</i> (Square Raspwort)	V	V	Occurs in 4 widely scattered localities in eastern NSW. It is disjunctly distributed in the central coast, south coast and north-western slopes botanical	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are

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			subdivisions of NSW. The species appears to require protected and shaded damp situations in riparian habitats.		absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Haloragodendron lucasii</i>	E	E	Occurs on Hawkesbury Sandstone in moist sandy loam soil. The species prefers sheltered aspects and inhabits gentle slopes below cliff lines near creeks in low open woodland or open forest. Its distribution is correlated with high soil moisture and phosphorus levels.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species not recently observed in the locality (NSW BioNet records).
<i>Prostanthera cryptandroides</i> subsp. <i>cryptandroides</i>	V	-	At Glen Davis, occurs in open forest dominated by <i>Eucalyptus fibrosa</i> . Other eucalypt species may be present as sub-dominants. In the Denman-Gungah and Widden-Baerami Valley areas, occurs on rocky ridgelines on Narrabeen Group Sandstones in association with a range of communities.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species not recently observed in the locality (NSW BioNet records).

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<i>Callistemon megalongensis</i>	CE	CE	Occurs in shrubby swamp habitat and swampy woodland. Associated species include <i>Callistemon citrinus</i> , <i>Leptospermum morrisonii</i> , <i>L. juniperinum</i> , <i>L. polygalifolium</i> , <i>L. obovatum</i> , <i>Empodisma minus</i> and <i>Grevillea asplenifolia</i> with occasional emergent <i>Melaleuca linearifolia</i> and <i>Eucalyptus camphora</i>	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Callistemon purpurascens</i>	CE	CE	Occurs in swampy, mostly riparian shrubland, swamp woodland and swamp forest with emergent <i>Melaleuca linariifolia</i> , <i>M. styphelioides</i> and <i>Eucalyptus camphora</i> . <i>Leptospermum</i> species are often dominant in the midstory. Ground stratum is variable depending on moisture levels, light levels and disturbance history and can include aquatic and semi aquatic species along with significant numbers of <i>Spiranthes</i> and <i>Drosera</i> at some sites. Only known from the swampy riparian zone of two unnamed tributaries of Megalong Creek below the Blue Mountains Plateau.	27	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Darwinia peduncularis</i>	V	-	Occurs as local disjunct populations in coastal NSW with a couple of isolated populations in the Blue Mountains. It has been recorded from Brooklyn, Berowra, Galston Gorge, Hornsby, Bargo River, Glen Davis, Mount Boonbourwa and Kings Tableland. Usually grows on or near rocky outcrops on sandy, well drained, low nutrient soil over sandstone.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species not recently observed in the locality (NSW BioNet records).
<i>Eucalyptus cannonii</i>	V	-	Restricted to an area of about 100 by 60 km in the central tablelands of NSW. The western border is	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat



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			approximately marked by a line between Bathurst and Mudgee, while the eastern locations occur approximately on a line between Lithgow and the town of Bylong. Within this area the species is often locally frequent. Recorded from Tablelands Grassy woodland Complex communities and Talus Slope woodland, and in Winburndale Nature Reserve within woodland dominated by Eucalyptus macrorhyncha and Eucalyptus gonicalyx.		surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Eucalyptus copulans</i>	E	E	Only one individual tree is currently known, on Council Reserve along Jamison Creek at Wentworth Falls in the Blue Mountains, NSW. A second tree nearby may also be <i>E. copulans</i> although it has not been formally identified as such. A larger population is thought to have occurred historically in the locality.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Eucalyptus macarthurii</i>	V	-	A moderately restricted distribution, recorded from the Moss Vale District to Kanangra Boyd National Park. In the Southern Highlands it occurs mainly on private land, often as isolated individuals in, or on the edges, of paddocks. Isolated stands occur in the north west part of the range on the Boyd Plateau. The only known record in the conservation estate is within Kanangra Boyd National Park. Occurs on grassy woodland on relatively fertile soils on broad cold flats.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Eucalyptus pulverulenta</i> (Silver-leaved Mountain Gum)	V	V	Found in two quite separate areas, the Lithgow to Bathurst area and the Monaro (Bredbo to Bombala). Grows in shallow soils as an understorey plant in open forest, typically dominated by brittle gum, red stringybark, broad-leaved peppermint, silvertop ash and apple box.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected,

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					would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Kunzea cambagei</i>	V	V	Occurs in wet heath and woodland on coarse sandy soil on sandstone and quartzite.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Rhodamnia rubescens</i> (Scrub Turpentine)	CE	-	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. This species is characterised as highly to extremely susceptible to infection by Myrtle Rust. Myrtle Rust affects all plant parts.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Cryptostylis hunteriana</i> (Leafless Tongue-orchid)	V	V	Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. The larger populations typically occur in woodland dominated by Scribbly Gum ( <i>Eucalyptus sclerophylla</i> ), Silvertop Ash ( <i>E. sieberi</i> ), Red Bloodwood ( <i>Corymbia gummifera</i> ) and Black Sheoak ( <i>Allocasuarina littoralis</i> ); appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid ( <i>C. subulata</i> ) and the Tartan Tongue Orchid ( <i>C. erecta</i> ).	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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<i>Prasophyllum fuscum</i> (Tawny Leek-orchid)	CE	V	Prasophyllum fuscum is endemic to New South Wales where it is currently known only from the upper catchment of the Georges River, south-west of Sydney. The only recent collection of the species is from a roadside in the Wilton district. The species is very similar to Prasophyllum uroglossum but occurs further north and differs by having a much shorter midlobe on the labellum and by having the callus extending well onto the midlobe. Prasophyllum pallens, which has also been confused with Prasophyllum fuscum, is known only from the Blue Mountains and can be distinguished by having paler-coloured flowers with a musty smell.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Rhizanthella slateri</i>	V	E	Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species not recently observed in the locality (NSW BioNet records).
<i>Thelymitra kangaloonica</i> (Kangaloon Sun Orchid)	CE	CE	Thelymitra sp. Kangaloon is only known to occur on the southern tablelands of NSW in the Moss Vale - Kangaloon - Fitzroy Falls area at 550-700 m above sea level. It is known to occur at three swamps that are above the Kangaloon Aquifer. It is found in swamps in sedgeland over grey silty grey loam soils	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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<i>Pherosphaera fitzgeraldii</i>	E	E	The Dwarf Mountain Pine occurs within the spray zone, drip lines or seepage areas of waterfalls on steep sandstone cliffs, ledges or below overhangs. Sites are at altitudes of 680–1000 m above sea level with south-easterly to south-westerly aspects, and have variable levels of shading (from no shading to significant shading from adjacent rainforest or overhangs).	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Grevillea evansiana</i> (Evans Grevillea)	V	V	Grows in dry sclerophyll forest or woodland, occasionally in swampy heath, in sandy soils, usually over Hawkesbury sandstone.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Isopogon fletcheri</i>	V	V	Grows in dry sclerophyll forest and heath on sandstone; confined to sheltered moist positions on the escarpment in the Blackheath district of the Blue Mtns, rare.	7	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species recently observed in the locality (NSW BioNet records).
<i>Persoonia acerosa</i>	V	V	Occurs in dry sclerophyll forest, scrubby low-woodland and heath on low fertility soils. Recorded	4	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however,

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			only on the central coast and in the Blue Mountains, from Mt Tomah in the north to as far south as Hill Top where it is now believed to be extinct. Mainly in the Katoomba, Wentworth Falls, Springwood area.		species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species recently observed in the locality (NSW BioNet records).
<i>Persoonia hindii</i>	E	-	Occurs in dry sclerophyll forests and woodlands on sandy soils. Stoloniferous (has underground horizontal stems) and is thought to be clonal. Hence, each location may comprise only one to a few individuals.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Persoonia hirsuta</i> (Hairy Geebung)	E	E	Distributed from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west. A large area of occurrence, but occurs in small populations, increasing the species's fragmentation in the landscape. Found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone. Usually present as isolated individuals or very small populations. Probably killed by fire (as other <i>Persoonia</i> spp. are) but will regenerate from seed.	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Species not recently observed in the locality (NSW BioNet records).
<i>Persoonia marginata</i>	V	V	Grows in dry sclerophyll forest and woodland communities on sandstone. Appears to respond well to disturbance, with greater densities found along	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Records (BCS 2021)	Likelihood of Occurrence
			the edges of tracks and in areas disturbed by forestry activities.		investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Species not recently observed in the locality (NSW BioNet records).
<i>Pomaderris cotoneaster</i>	E	E	Cotoneaster Pomaderris has been recorded in a range of habitats in predominantly forested country. The habitats include forest with deep, friable soil, amongst rock beside a creek, on rocky forested slopes and in steep gullies between sandstone cliffs.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Boronia deanei</i>	V	V	Scattered populations occur between the far south-east of NSW and the Blue Mountains (including the upper Kangaroo River near Carrington Falls, the Endrick River near Nerriga and Nalbaugh Plateau), mainly in conservation reserves. Grows in wet heath, often at the margins of open forest adjoining swamps or along streams.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Leionema lachnaeoides</i>	E	E	Habitat vegetation is montane heath and commonly includes <i>Eucalyptus stricta</i> , <i>Allocasuarina nana</i> , <i>Dillwynia retorta</i> , <i>Epacris microphylla</i> and <i>Caustis flexuosa</i> . Populations occur on exposed sandstone cliff tops and terraces, at 960 - 1000m altitude and with aspects from south-east to south-west.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected,

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Records (BCS 2021)	Likelihood of Occurrence
					would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Leionema sympetalum</i> (Rylstone Bell)	V	V	Restricted to exposed rocky sandstone formations known as pagodas. The species occurs in dry sclerophyll forest and probably also occurs in open or closed heathland communities.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Zieria covenyi</i>	E	E	Occurs in open sclerophyll forest dominated by <i>Eucalyptus sieberi</i> . The species occurs on gentle east and south-facing slopes and on ridges in shallow sandy soil. Has been recorded from only one location, Narrow Neck Peninsula within Blue Mountains National Park, south-west of Katoomba in the Central Blue Mountains.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Zieria involuocrata</i>	E	V	Has a disjunct distribution in the Baulkham Hills, Hawkesbury, Hornsby and Blue Mountains LGAs. Recent records for the species come from 22 populations in the catchments of the Macdonald, Colo and Hawkesbury Rivers. Occurs on Hawkesbury sandstone, Narrabeen Group sandstone and on Quaternary alluvium. Found in sheltered forests on mid- to lower slopes and valleys, in or adjacent to gullies which support sheltered forest, although some populations extend up-slope into drier vegetation.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Records (BCS 2021)	Likelihood of Occurrence
<i>Zieria murphyi</i>	V	V	The species grows in open, dry sclerophyll forest, on sandy soils on sandstone and in sheltered sites, often just below clifflines	0	Moderate. Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy. Species not recently observed in the locality (NSW BioNet records).
<i>Thesium australe</i> (Austral Toadflax)	V	V	Grows in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. It is also found in Tasmania and Queensland and in eastern Asia. Occurs in grassland or grassy woodland. Grows on kangaroo grass tussocks but has also been recorded within the exotic coolatai grass.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Euphrasia arguta</i>	CE	CE	Occur in eucalypt forest with a mixed grass and shrub understorey within Nundle State forest. Sites have either been logged in the last few decades, or appear to have regrown from past clearing.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Euphrasia bowdeniae</i>	V	V	This species is known to occur at 750 m asl but is likely to occur up to 1000-1100 m asl. It is found on vertical sandstone cliffs, in very shallow soil on rocky ledges, or trailing over steep exposed rocks.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of



Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Records (BCS 2021)	Likelihood of Occurrence
					occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Veronica blakelyi</i>	V	-	Restricted to the western Blue Mountains, near Clarence, near Mt Horrible, on Nullo Mountain and in the Coricudgy Range. Occurs at fewer than 20 locations, none of which is in a conservation reserve. Occurs in eucalypt forest, often in moist areas.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species not recently observed in the locality (NSW BioNet records).
<i>Hygrocybe anomala</i> var. <i>ianthinomarginata</i>	V	-	Occurs in gallery warm temperate forests dominated by lilly pilly, grey myrtle, cheese tree and sweet pittosporum. Associated with alluvial sandy soils of the Hawkesbury Soil Landscapes with naturally low fertility and erodible. Occur as individuals or in groups, terrestrial rarely on wood and only if extremely rotten; substrates include soil, humus, or moss.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Hygrocybe aurantipes</i>	V	-	Occurs in gallery warm temperate forests dominated by lilly pilly, grey myrtle, cheese tree and sweet pittosporum. Associated with alluvial sandy soils of the Hawkesbury Soil Landscapes with naturally low fertility and erodible. Occur as individuals or in groups, terrestrial rarely on wood and only if	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Records (BCS 2021)	Likelihood of Occurrence
			extremely rotten; substrates include soil, humus, or moss.		2017)). Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Hygrocybe reesiaie</i>	V	-	Occurs in gallery warm temperate forests dominated by lilly pilly, grey myrtle, cheese tree and sweet pittosporum. Associated with alluvial sandy soils of the Hawkesbury Soil Landscapes with naturally low fertility and erodible. Occur as individuals or in groups, terrestrial rarely on wood and only if extremely rotten; substrates include soil, humus, or moss.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

# Appendix C – Assessments

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## Test of Significance: *Litoria littlejohni* (Littlejohn's Tree Frog)

### **(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**

The proposal will reduce the extent of potential habitat for the *Litoria littlejohni* (Littlejohn's Tree Frog). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

### **(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

#### **(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**

The Proposal will not fragment or isolate the habitat of this species.

#### **(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

### **(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## **CONCLUSION**

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Litoria littlejohni* (Littlejohn's Tree Frog) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Litoria littlejohni* (Littlejohn's Tree Frog).

### **Test of Significance: *Heleioporus australiacus* (Giant Burrowing Frog)**

**(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**

The proposal will reduce the extent of potential habitat for the *Heleioporus australiacus* (Giant Burrowing Frog). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

### **CONCLUSION**

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Heleioporus australiacus* (Giant Burrowing Frog) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Heleioporus australiacus* (Giant Burrowing Frog).

### Test of Significance: *Pseudophryne australis* (Red-crowned Toadlet)

**(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**

The proposal will reduce the extent of potential habitat for the *Pseudophryne australis* (Red-crowned Toadlet). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

### CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Pseudophryne australis* (Red-crowned Toadlet) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Pseudophryne australis* (Red-crowned Toadlet).

### **Test of Significance: *Artamus cyanopterus cyanopterus* (Dusky Woodswallow)**

**(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**

The proposal will reduce the extent of potential habitat for the *Artamus cyanopterus cyanopterus* (Dusky Woodswallow). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

### **CONCLUSION**

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Artamus cyanopterus cyanopterus* (Dusky Woodswallow) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Artamus cyanopterus cyanopterus* (Dusky Woodswallow).

## Test of Significance: *Callocephalon fimbriatum* (Gang-gang Cockatoo)

**(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**

The proposal will reduce the extent of potential habitat for the *Callocephalon fimbriatum* (Gang-gang Cockatoo). 'Loss' includes the removal of 0.34 ha of habitat that is likely to be occupied and/ or relied on by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Callocephalon fimbriatum* (Gang-gang Cockatoo) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Callocephalon fimbriatum* (Gang-gang Cockatoo).



## Test of Significance: *Daphoenositta chrysoptera* (Varied Sittella)

**(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**

The proposal will reduce the extent of potential habitat for the *Daphoenositta chrysoptera* (Varied Sittella). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Daphoenositta chrysoptera* (Varied Sittella) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Daphoenositta chrysoptera* (Varied Sittella).

## Test of Significance: *Petroica boodang* (Scarlet Robin)

**(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**

The proposal will reduce the extent of potential habitat for the *Petroica boodang* (Scarlet Robin). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Petroica boodang* (Scarlet Robin) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Petroica boodang* (Scarlet Robin).

## Test of Significance: *Petroica phoenicea* (Flame Robin)

**(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**

The proposal will reduce the extent of potential habitat for the *Petroica phoenicea* (Flame Robin). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Petroica phoenicea* (Flame Robin) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Petroica phoenicea* (Flame Robin).

### Test of Significance: *Glossopsitta pusilla* (Little Lorikeet)

**(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**

The proposal will reduce the extent of potential habitat for the *Glossopsitta pusilla* (Little Lorikeet). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

### CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Glossopsitta pusilla* (Little Lorikeet) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Glossopsitta pusilla* (Little Lorikeet).

## Test of Significance: *Ninox connivens* (Barking Owl)

**(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**

The proposal will reduce the extent of potential habitat for the *Ninox connivens* (Barking Owl). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Ninox connivens* (Barking Owl) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Ninox connivens* (Barking Owl).

## Test of Significance: *Ninox strenua* (Powerful Owl)

**(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**

The proposal will reduce the extent of potential habitat for the *Ninox strenua* (Powerful Owl). 'Loss' includes the removal of 0.34 ha of habitat that is likely to be occupied and/ or relied on by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Ninox strenua* (Powerful Owl) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Ninox strenua* (Powerful Owl).

## Test of Significance: *Cercartetus nanus* (Eastern Pygmy-possum)

**(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**

The proposal will reduce the extent of potential habitat for the *Cercartetus nanus* (Eastern Pygmy-possum). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Cercartetus nanus* (Eastern Pygmy-possum) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Cercartetus nanus* (Eastern Pygmy-possum).

### Test of Significance: *Dasyurus maculatus maculatus* (Spotted-tailed Quoll)

**(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**

The proposal will reduce the extent of potential habitat for the *Dasyurus maculatus maculatus* (Spotted-tailed Quoll). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

### CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Dasyurus maculatus maculatus* (Spotted-tailed Quoll) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Dasyurus maculatus maculatus* (Spotted-tailed Quoll).



## Test of Significance: *Isoodon obesulus obesulus* (Southern Brown Bandicoot (eastern))

**(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**

The proposal will reduce the extent of potential habitat for the *Isoodon obesulus obesulus* (Southern Brown Bandicoot (eastern)). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Isoodon obesulus obesulus* (Southern Brown Bandicoot (eastern)) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Isoodon obesulus obesulus* (Southern Brown Bandicoot (eastern)).

## Test of Significance: *Phascolarctos cinereus* (Koala)

**(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**

The proposal will reduce the extent of potential habitat for the *Phascolarctos cinereus* (Koala). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Phascolarctos cinereus* (Koala) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Phascolarctos cinereus* (Koala).

## Test of Significance: *Pteropus poliocephalus* (Grey-headed Flying-fox)

**(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**

The proposal will reduce the extent of potential habitat for the *Pteropus poliocephalus* (Grey-headed Flying-fox). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Pteropus poliocephalus* (Grey-headed Flying-fox) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Pteropus poliocephalus* (Grey-headed Flying-fox).

## Test of Significance: *Chalinolobus dwyeri* (Large-eared Pied Bat)

**(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**

The proposal will reduce the extent of potential habitat for the *Chalinolobus dwyeri* (Large-eared Pied Bat). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Chalinolobus dwyeri* (Large-eared Pied Bat) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Chalinolobus dwyeri* (Large-eared Pied Bat).

## Test of Significance: *Miniopterus australis* (Little Bentwing-bat)

**(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**

The proposal will reduce the extent of potential habitat for the *Miniopterus australis* (Little Bentwing-bat). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Miniopterus australis* (Little Bentwing-bat) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Miniopterus australis* (Little Bentwing-bat).

## Test of Significance: *Miniopterus orianae oceanensis* (Large Bent-winged Bat)

**(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**

The proposal will reduce the extent of potential habitat for the *Miniopterus orianae oceanensis* (Large Bent-winged Bat). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Miniopterus orianae oceanensis* (Large Bent-winged Bat) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Miniopterus orianae oceanensis* (Large Bent-winged Bat).

## Test of Significance: *Persoonia hirsuta* (Hairy Geebung)

**(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**

The proposal will reduce the extent of potential habitat for the *Persoonia hirsuta* (Hairy Geebung). 'Loss' includes the removal of 0.34 ha of habitat that may be occupied and/ or utilised by the species for part of its lifecycle within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

**(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

**(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**

The Proposal will not fragment or isolate the habitat of this species.

**(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

**(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## CONCLUSION

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Persoonia hirsuta* (Hairy Geebung) within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Persoonia hirsuta* (Hairy Geebung).

## Test of Significance: *Persoonia marginata*

### **(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**

The proposal will reduce the extent of potential habitat for the *Persoonia marginata*. 'Loss' includes the removal of 0.34 ha of habitat that may be utilised infrequently by the species as part of its lifecycle. within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

### **(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

#### **(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**

The Proposal will not fragment or isolate the habitat of this species.

#### **(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

### **(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## **CONCLUSION**

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Persoonia marginata* within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Persoonia marginata*.



## Test of Significance: *Zieria murphyi*

### **(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**

The proposal will reduce the extent of potential habitat for the *Zieria murphyi*. 'Loss' includes the removal of 0.34 ha of habitat that may be utilised infrequently by the species as part of its lifecycle. within a landscape context that is in a near pre-European state (i.e. <20% cleared). Impact avoidance were not deemed necessary to manage direct and/ or indirect impacts on the species. While it is possible that the Proposal may have an adverse impact on the life cycle of the species, it is considered that this impact is negligible and inconsequential and therefore not of an extent and/ or intensity that is likely to place a local viable population of the species 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**

Assessment not applicable to this 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**

Assessment not applicable to this species.

### **(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**

The Proposal will result in a reduction of the species habitat extent by an estimated < 0.01% relative to similar habitat within the region (PCT 1248). This is a negligible impact on the extent of this species habitat.

#### **(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**

The Proposal will not fragment or isolate the habitat of this species.

#### **(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,**

The species has potential to occupy habitat identified within the Proposal area, although it has not been detected within this area. The habitat area to be impacted is not important for genetic flow, life cycle function or persistence within the locality. On this basis it is considered that the importance of the habitat to be removed is low.

### **(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),**

The Proposal is not 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.**

The act of clearing native vegetation is an action that forms part of the proposal and is a key threatening process (i.e. 'Clearing of native vegetation'). The proposal will increase the impact of this key threatening process by incrementally reducing native vegetation cover within an already highly over cleared landscape (NPWS 2002).

## **CONCLUSION**

The proposal is not likely to substantially reduce the extent nor connectivity of habitat important for *Zieria murphyi* within the local area. Impact avoidance and/ or ameliorative measures were not deemed necessary to manage direct and/ or indirect impacts on the species. The lifecycle of the species is not likely to be adversely impacted to an extent that would threaten a viable local population of the species. On this basis, it is considered that the Proposal is not likely to have a significant impact on *Zieria murphyi*.

## Commonwealth Assessments – Vulnerable species

The proposal is likely to have an impact on the habitat of the following species:

- Koala
- Grey-headed Flying-fox
- Spotted-tailed Quoll
- New Holland Mouse
- Greater Glider
- *Persoonia marginata*
- *Zieria murphyi*

Assessments against the criteria of vulnerable species is provided as follows.

### Lead to a long-term decrease in the size of an important population of a species

The proposal will not result in a reduction of occupied threatened species habitat and/ or an extent of habitat that would influence the size of an important population. It is considered that the Proposal is not likely to lead to a long-term decrease in the size of an important population of a vulnerable listed threatened species.

### Reduce the area of occupancy of the species

The proposal is likely to result in a negligible reduction in the area of unoccupied threatened species habitat identified as having the potential to occur within the Proposal area. The Proposal will not reduce the area of occupancy of a vulnerable listed threatened species.

### Fragment an existing population into two or more populations

The proposal will increase the distance separating potential habitat of a threatened species, although the nett change in separation will not increase the existing fragmentation effect on potential habitat. It is considered that the proposal will not separate any populations into two or more populations.

### Adversely affect habitat critical to the survival of an important population

The proposal will have no impact on habitat important to the species. The Proposal is unlikely to affect habitat critical to the survival of the species.

### Disrupt the breeding cycle of a population

The proposal will not disrupt the breeding cycle of an important population of a vulnerable listed threatened species.

### Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The proposal is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that a listed vulnerable species is likely to decline.

### Result in invasive species that are harmful to vulnerable species becoming established in the vulnerable species' habitat

The proposal is not expected to result in additional invasive species that are harmful to a threatened species.

### Introduce disease that may cause the species to decline

The proposal is not expected to introduce a disease harmful to a threatened species.

**Interfere with the recovery of the species**

The proposal is not expected to interfere with the recovery of a threatened species.

**CONCLUSION**

The proposal is not likely to substantially reduce the extent or fragment any populations of a threatened species. Habitat critical to the survival of a threatened species would not be adversely affected by proposal. The proposal will not interfere with the recovery of a threatened species. On this basis, it is considered that the proposal is not likely to have a significant impact on a Commonwealth listed threatened species.

## Commonwealth Assessments – Endangered and Critically Endangered species

The proposal is likely to have an impact on the habitat of the following species:

- Southern Brown Bandicoot
- *Persoonia hirsuta*

Assessments against the criteria of endangered and critically endangered species is provided as follows.

### Lead to a long-term decrease in the size of a population

The proposal will not result in a reduction of habitat for a threatened species and/ or an extent of habitat that would influence the size of a population. It is considered that the Proposal is not likely to lead to a long-term decrease in the size of a population of an endangered or critically endangered species.

### Reduce the area of occupancy of the species

The proposal is likely to result in a negligible reduction in the area of occupancy for the assessed threatened species.

### Fragment an existing population into two or more populations

The proposal will increase the distance separating potential habitat of a threatened species, although the nett change in separation will not increase the existing fragmentation effect on potential habitat. It is considered that the proposal will not separate any populations into two or more populations.

### Adversely affect habitat critical to the survival of the species

The proposal will have no impact on habitat important to the species. The Proposal is unlikely to affect habitat critical to the survival of the species.

### Disrupt the breeding cycle of a population

The proposal will not disrupt the breeding cycle of a population.

### Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The proposal is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that a listed vulnerable species is likely to decline.

### Result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat

The proposal is not expected to result in additional invasive species that are harmful to a threatened species.

### Introduce disease that may cause the species to decline

The proposal is not expected to introduce a disease harmful to a threatened species.

### Interfere with the recovery of the species

The proposal is not expected to interfere with the recovery of a threatened species.

## Commonwealth Assessments – Endangered and Critically Endangered species

### CONCLUSION

The proposal is not likely to substantially reduce the extent or fragment any populations of a threatened species. Habitat critical to the survival of a threatened species would not be adversely affected by proposal. The proposal will not interfere with the recovery of a threatened species. On this basis, it is considered that the proposal is not likely to have a significant impact on a Commonwealth listed threatened species.

## Commonwealth Assessments – Threatened Ecological Community

The proposal is likely to have an impact on the habitat of the following threatened ecological community:

- Temperate Highland Peat Swamp on Sandstone EEC

Assessments against the criteria of threatened ecological communities is provided as follows.

### **reduce the extent of an ecological community**

The proposal will not reduce the extent of Temperate Highland Peat Swamp on Sandstone EEC

### **fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines**

The proposal will not the fragmentation of Temperate Highland Peat Swamp on Sandstone EEC.

### **adversely affect habitat critical to the survival of an ecological community**

The proposal is not likely to affect habitat critical to the survival of Temperate Highland Peat Swamp on Sandstone EEC.

### **modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns**

The proposal will not modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for the survival of Temperate Highland Peat Swamp on Sandstone EEC including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.

### **cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting**

The proposal will not substantially change in the species composition of an occurrence of Temperate Highland Peat Swamp on Sandstone EEC, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.

### **cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to**

**assisting invasive species, that are harmful to the listed ecological community, to become established, or**

The proposal is not expected to introduce an invasive species harmful to Temperate Highland Peat Swamp on Sandstone EEC.

### **causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or**

The proposal is not expected to cause regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into Temperate Highland Peat Swamp on Sandstone EEC that will kill or inhibit the growth of species in the ecological community.

## Commonwealth Assessments – Threatened Ecological Community

### Interfere with the recovery of the ecological community

The proposal is likely to interfere with the recovery of Temperate Highland Peat Swamp on Sandstone EEC as the proposal is removing remnant vegetation within a highly over cleared landscape.

### CONCLUSION

The proposal is not likely to reduce the extent and fragment Temperate Highland Peat Swamp on Sandstone EEC. Habitat critical to the survival of a threatened species would not be adversely affected by proposal. However, the proposal may interfere with the recovery of Temperate Highland Peat Swamp on Sandstone EEC as the removal of habitat is within a highly over cleared landscape; although the area of habitat to be removed is in a compromised condition with removal not likely to adversely impact specific diversity or genetic flow in the local area. On this basis, it is considered that the proposal is not likely to a significant impact on Temperate Highland Peat Swamp on Sandstone EEC.