Biodiversity Development Assessment Report

Small Area Streamlined Assessment for Tourist Accommodation at Thredbo Village

August 2022

Project Number: 21-917

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Final V.1.1	19/07/2022	Gillian Young (BDAR, Appendix A-E) Taylor Hume (Appendix F)	Beth Noel (BAAS19015)	Beth Noel (BAAS19015)
Final V1.1	26/08/2022	Gillian Young (Updated credit reports + submission of BAM C to decision maker)	Tammy Vesely	Gillian Young (BAAS17086)

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Accredited Assessor Declaration

I certify that this report has been prepared on the basis of the requirements of, and information provided under, the Biodiversity Assessment Method and s6.15 of the BC Act. It has been assessed in accordance with BAM 2020. A full list of staff qualifications and experience can be found in Appendix F of this report.

In preparing this assessment I have acted in accordance with the Accredited BAM Assessor Code of Conduct.

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest.

Signature: 

Name: Gillian Young

Date: 26/08/2022

BAM Assessor Accreditation No: BAAS17086

The associated development case (00032604/BAAS17086/22/00032605) within the BAM Calculator is finalised (on the 26/08/22), with the associated credit reports found in Appendix B and generated in Revision 2 of the calculator.

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Acronyms and abbreviations

ASL	Above sea level
AWS	Automatic weather station
BAM	Biodiversity Assessment Method 2020
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BDAR	Biodiversity Development Assessment Report
Biosecurity Act	*Biosecurity Act 2015* (NSW)
BOM	Australian Bureau of Meteorology
Cwth	Commonwealth
DCCEEW	Department of Climate Change, Energy, Environment and Water (formally DAWE)
DPIE	Department of Planning, Industry and Environment (NSW)
EEC	Endangered ecological community – as defined under relevant law applying to the proposal
EIA	Environmental impact assessment
EIS	Environmental impact statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwth)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
ESD	Ecologically Sustainable Development
FM Act	*Fisheries Management Act 1994* (NSW)
ha	hectares
Heritage Act	*Heritage Act 1977* (NSW)
SEPP	State Environmental Planning Policy (Precincts - Regional) 2021 (NSW)
KFH	Key Fish Habitat
km	kilometres
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
m	metres
MNES	Matters of National Environmental Significance under the EPBC Act (*c.f.*)
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NV Act	*Native Vegetation Act 2003* (NSW)
OEH	(Former) Office of Environment and Heritage (NSW) (now EES)

Executive summary

NGH Pty Ltd has been engaged by Le Hunte Properties Pty Ltd to complete a Biodiversity Development Assessment Report (BDAR) within and surrounding Lot 768 1119757 at 5 Diggings Terrace, Thredbo. A Development Application (DA) for the proposal must be submitted under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and accompanied by a BDAR. Kosciuszko Thredbo Pty Ltd are the head lessee of the resort and responsible for management of Lot 768 and surrounds.

The area proposed for development is covered by native vegetation, half of the area contains forest and the other half contains native groundcovers. The total area of native vegetation is 1.0 hectare. The surrounding area includes Thredbo village precinct and Kosciuszko National Park. There is no minimum lot size associated with the lot under the SEPP.

The entire site is likely to be cleared either fully or partially for buildings, hardstand and asset protection zones (bushfire hazard reduction) and this generates an offset obligation through ecosystem credits for the two vegetation zones. The ecosystem credits are:

- Vegetation Zone 1 **Trees-Shrubs-Groundcover**: PCT 639, Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion generates 13 ecosystems credits
- Vegetation Zone 2 **Groundcover**: PCT 639, Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion generates 3 ecosystems credits
- No species credits are generated from this assessment. Being a small areas BDAR, only candidate species that are listed as Serious and Irreversible (SAII) require assessment under the BAM. The two species assessed (Large Bent-wing Bat and Orange-bellied Parrot) were assessed and ruled out due to inappropriate habitat onsite.

An Assessment of Significance under the EPBC Act was completed for the Spot-tailed Quoll, Gang-gang Cockatoo, Koala and Broad-toothed Rat. The assessment of significance indicates that no EPBC listed species require referral and no offsets required.

To prevent impacts to flora and fauna, waterways and neighbouring native vegetation mitigation measures have been outlined in the development of the construction phase of the development.

1. Introduction

NGH Pty Ltd has been engaged by Le Hunte Properties Pty Ltd to complete a Biodiversity Development Assessment Report (BDAR) within and surrounding Lot 768 1119757 at 5 Diggings Terrace, Thredbo. A Development Application (DA) for the proposal must be submitted under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) accompanied by a BDAR.

1.1 Description of proposed development

It is proposed to build new tourist accommodation onsite within Lot 768. The surrounding area also includes National Park. There is no minimum lot size is associated with lot 768 under the SEPP. The size of the lot is approximately 0.5ha, therefore clearing 0.25ha triggers the BOS. The current proposal aims to clear up to1.0 hectare including asset protection zones outside of Lot 768 which exceeds the BOS threshold (0.25ha).

The clearing of native vegetation must comply with the NSW *Biodiversity Conservation Act 2016* (BC Act). This report aims to identify and document the main biodiversity values associated with the proposed development to allow the principles of avoidance, minimisation and mitigation to be considered as required under the BAM.

1.1.1 BAM terminology used in this report

From the information provided by the client, it is understood that the proposed development will involve clearing up to1.0 hectare for tourist accommodation including asset protection zones required under Planning for Bushfire Protection 2016.

The following terms are used in this document:

- **Subject Land/Development Footprint** – The area of land that is directly impacted by the proposal including all of Lot 768 and a 35m buffer extending into part of Lot 876 DP1243112 utilised as a bushfire asset protection zone. Total impacts are assumed to allow fully flexibility in clearing/management and is the area where Stage 1 of the BAM has been applied. For definitions described under BAM 20, the subject land shares the same area as the development site and development footprint.
- **Buffer area** – All land within 1500m of the outside edge of the boundary of the development site.
- **Construction footprint** –building envelopes for tourist accommodation.

1.2 The Subject Land

1.2.1 Subject land boundary and location

The subject land boundary includes all of Lot 768 and also includes a 35 metre buffer surrounding the construction footprint where there is unmanaged land (south east and south west of the construction footprint). The subject land is located at 5 Diggins Terrace Thredbo Village. Kosciuszko Thredbo Pty Ltd are the head lessee of the resort and responsible for management of Lot 768 and surrounds. Refer for Figure 1-1 for a site map.

1.2.2 Subject land description

The subject land is covered with native vegetation. Approximately one third of the site consists of cleared areas devoid of woody vegetation with native and exotic groundcovers. The remaining two thirds of the subject land contains woody vegetation with native shrubs and groundcovers.

1.3 Source of Information Used in the Assessment

The following details sources of information used in the preparation of this report:

- Australia's IBRA bioregions and subregions (DAWE, 2020) http://environment.gov.au/land/nrs/science/ibra/australias-bioregions-maps
- Department of Environment and Climate Change NSW (DECC, 2002). Descriptions for NSW (Mitchell) Landscapes, Version 3
- NSW Biodiversity Assessment Method (BAM) calculator (DPIE, NSW Biodiversity Accredited Assessor System, n.d.) (www.environment.nsw.gov.au/bbccapp/ui/mynews.aspx)
- NSW DPIE's BioNet threatened biodiversity database (OEH, 2021). Accessed online via login at www.bionet.nsw.gov.au
- BioNet Vegetation Classification Database (DPIE, Bionet Veg Classification, 2021) Accessed online via login at: www.environment.nsw.gov.au/NSWVCA20PRapp/default.aspx
- DPIE VIS Mapping (DPIE, State Vegetation Mapping, 2019) Accessed online at http://www.environment.nsw.gov.au/research/VISmap.htm
- NSW Department of Planning Infrastructure and Environment BAM (DPIE, Biodiversity Assessment Method, 2020).
- NSW Government SEED Mapping (SEED, 2021)
- https://geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Public_Viewer&locale=en-AU
- NSW Biodiversity Values Map (DPIE, Biodiversity Values Mapping tool, 2021) www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap
- Aerial imagery of historical land use (Sourced from Google Earth and NSW Spatial Services Delivery)

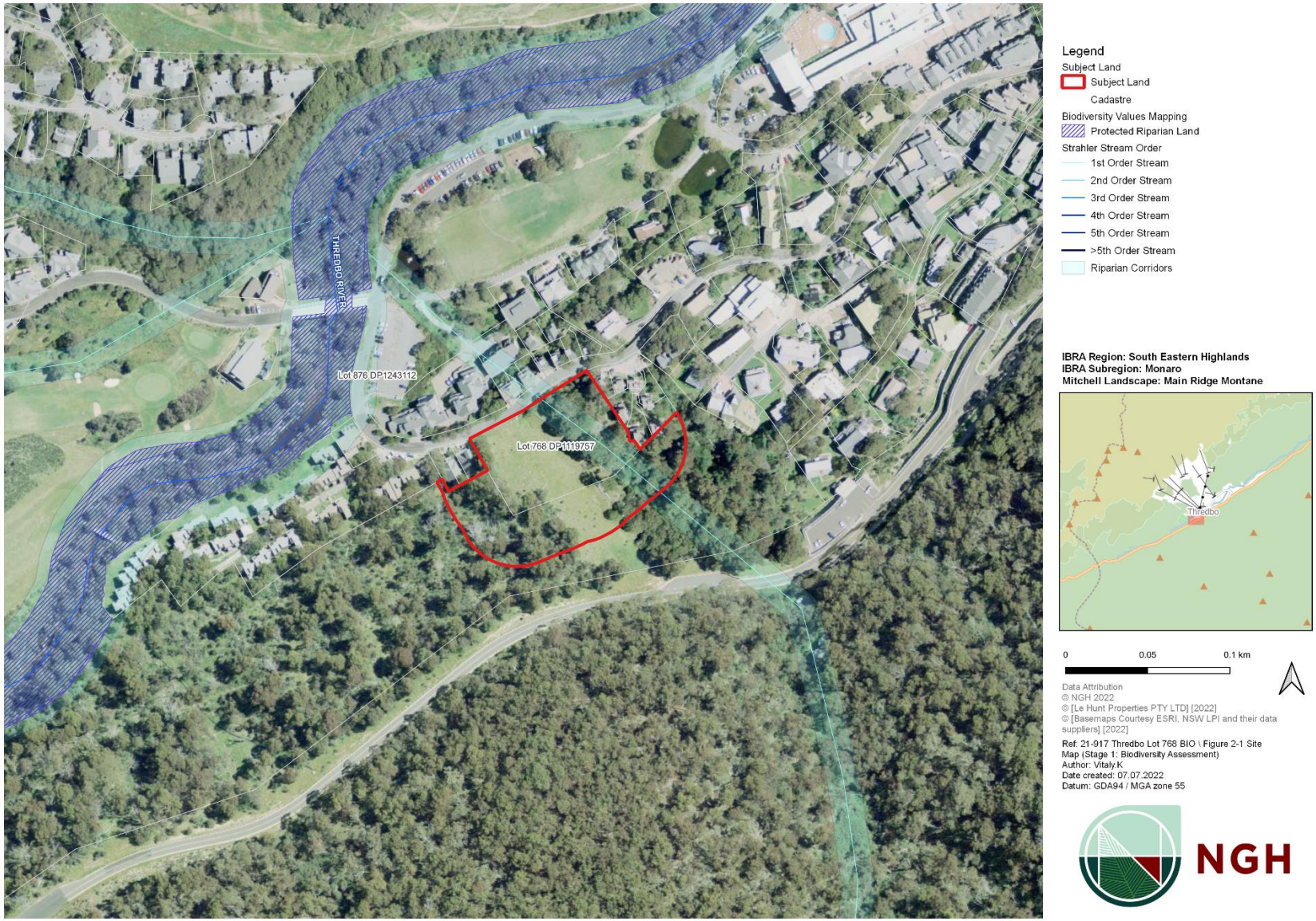

Figure 1-1 Site Map

2. Landscape

2.1 Subject land topography, hydrology, geology and soils

The subject land is located at an elevation of 1400m above sea level. The site consists of steep slopes >10 degrees and with an aspect to the south-east. There is a minor first order watercourse running through the eastern portion of the lot. The stream did not appear to run through the subject land and was only observed on the northern boundary where it flows under the road. Soils are sandy and derived from granite.

2.2 Percent Native Vegetation Cover in assessment area

There is 100% native vegetation cover inside the subject land. There is 95% native vegetation cover inside the 1500m buffer, including and surrounding the subject land. Grassy groundcover was also classified as native vegetation based on field observations of the general locality and included all the ski fields which are devoid of woody vegetation.

2.3 IBRA Bioregions and Subregions and Mitchell Landscape

The subject land is in the 'South Eastern Highlands' IBRA and 'Monaro' Subregion and within 'Main Range Montane' Mitchell Landscape. This was entered into the BAM Calculator for the proposal. These are shown on FIGURE XX.

2.4 Wetlands within or close to the site

No wetlands are located within or close to the subject land.

2.5 Connectivity of habitat

The subject land does not contain vegetation links that are essential for preserving connectivity of native habitat across the landscape. The vegetation proposed for clearing forms part of a much larger patch of native vegetation exceeding 1000ha. The subject land is somewhat fragmented from more extensive habitat by Thredbo Diggins road to the north, the Alpine Way to the south and existing tourist accommodation to the east and west.

2.6 Areas of Geological Significance and Soil Hazards

There are no karsts, caves or crevices or rocks inside the subject land. Soils are sandy and could be prone to erosion following any land clearing onsite

2.7 Areas of Outstanding Biodiversity Value

No areas of outstanding biodiversity value occur within the subject land. Thredbo River is mapped as having biodiversity value and is located 73m northwest of the boundary of the subject land.

2.8 Native Vegetation Extent

A 1500 metre buffer was applied around the subject land. This area covers 769 hectares. The native vegetation cover is 733 hectares. This equates to 95% native vegetation cover within the 1500m buffer area.

2.9 Areas not containing native vegetation

In relation to the 1500m buffer applied, the remaining 5% was considered not to contain native vegetation. This consisted of hard stand areas like buildings, roads, carparks and included waterbodies as can be seen on Figure 2-1 Native Vegetation Extent Map below.

3. Native Vegetation

3.1 Native Vegetation Extent

In relation to the subject land, the entire area (1 ha) contains native vegetation, as either trees or shrubs or groundcovers. Refer to Figure 3-1 Native Vegetation Extent Map below.

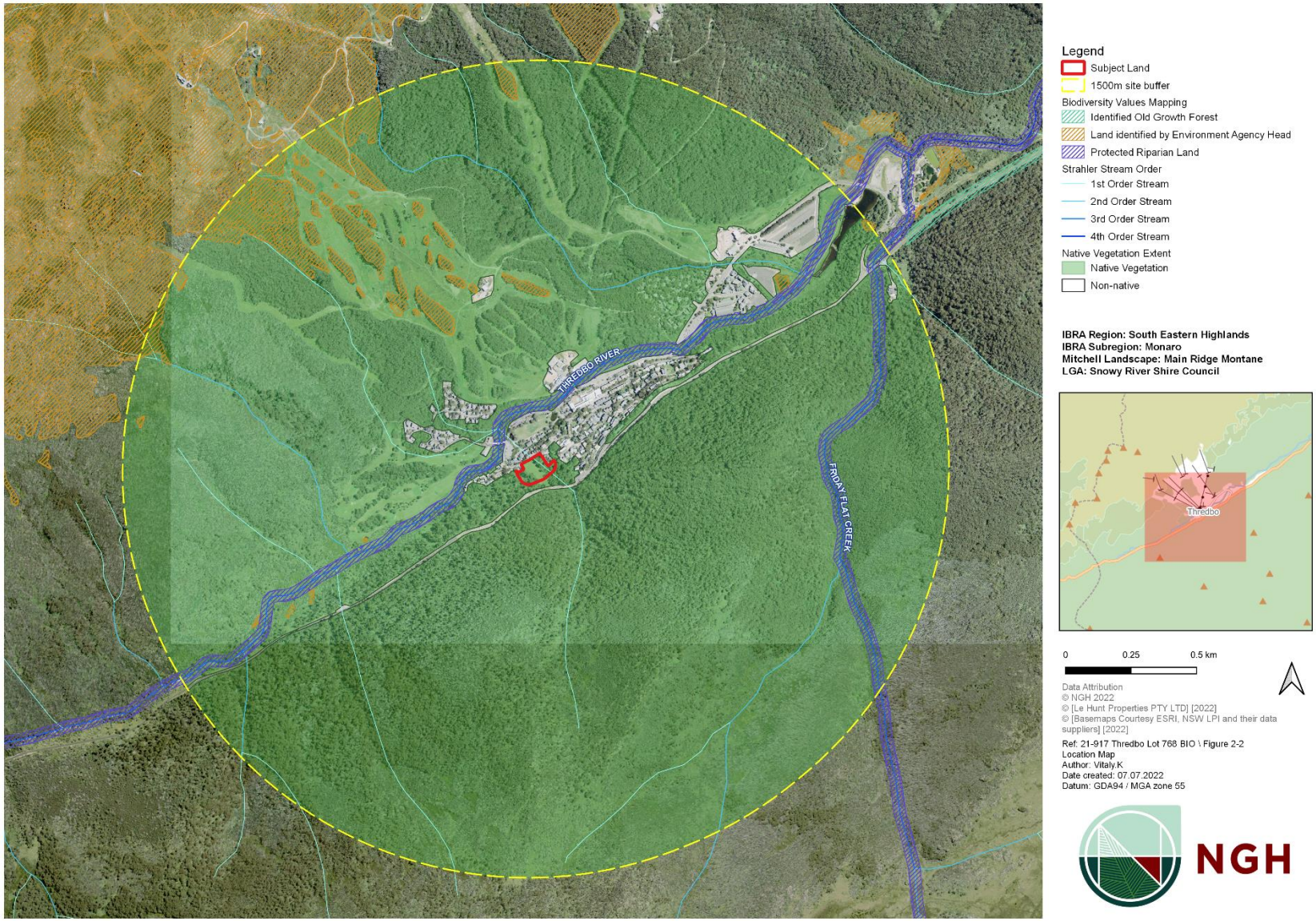

Figure 3-1 Location Map (Native Vegetation Extent for 1500m surrounding subject land)

3.2 Plant Community Types (PCTs)

3.2.1 Methods to Assess PCTs

Review of existing information

A search was undertaken of the OEH BioNet Vegetation Classification Tool (BioNet) database and the NSW SEED Mapping Portal to review existing vegetation mapping within the development site. SELLS vegetation mapping (South East Local Land Services Biometric vegetation map) (DPIE 2014) shows seven biometric vegetation types within 10 kilometres of the subject land. The vegetation communities are:

- MR501 *Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands and Australian Alps*
- SR 501 *Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands and Australian Alps*
- SR 502 *Alpine Ash - Mountain Gum moist shrubby tall open forest of montane areas, southern South Eastern Highlands and Australian Alps*
- SR 507 *Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps*
- SR 509 *Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps*
- SR638 *Snow Gum - Mountain Gum shrubby open forest of montane areas, South Eastern Highlands and Australian Alps*

SEED Mapping – Sharing and Enabling Environmental Data (2017).

There is one mapped biometric vegetation type inside the subject land which includes:

- SR638 *Snow Gum - Mountain Gum shrubby open forest of montane areas, South Eastern Highlands and Australian Alps*

This converts into Plant Community Type (PCT) 1196 Snow Gum - Mountain Gum shrubby open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion.

Field surveys and personnel

Field survey was conducted on the 23rd of March 2022 by an accredited BAM ecologist and an ecologist for approximately 4 hours.

Floristic surveys

Lot 768 was surveyed on foot which involved mapping vegetation zones and noting hollow bearing trees and habitat features. Vegetation integrity plots (BAM Plots 1 and 2) were completed during this visit representing woody and non-woody structures observed in the vegetation.

PCT's were identified from the native species present inside BAM plots, landscape characters and location of the subject land in relation to IBRA and subregion using the BioNet Vegetation Classification Database. The subject land was then stratified into areas of similar condition class to determine vegetation zones for each PCT.

3.2.2 Limitations

Areas comprising the subject land that are south of Lot 768 (proposed for asset protection zones) have not been ground truthed. The PCT is assumed to be the same as vegetation found inside Lot 768 and mapped according to presence or absence of trees using aerial photography. Hollow bearing trees have not been investigated in this area.

It was considered that a second site inspection was not warranted based on the 'small areas' streamlined nature of this clearing proposal under the BAM.

3.2.3 PCTs identified on the development site

One PCT was identified inside the subject land which was PCT 639 '*Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion*'. This PCT was divided into two zones. Zone (1) comprises native trees, native shrubs of varying density and native groundcovers and can been seen on aerial photography where trees are present. Zone (2) comprises a mix of native and exotic groundcovers and lacks tree cover.

Table 3-1 Description of PCT (639) in the development site

PCT name		
Vegetation formation	Wet Sclerophyll Forests (Grassy sub-formation)	
Vegetation class	Montane Wet Sclerophyll Forests	
Vegetation type	PCT ID	639
	Common Community Name	Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
Approximate extent within the development site	PCT 639 Zone 1: 0.67 ha Zone 2: 0.33 ha	
Species relied upon for PCT identification	Species name and stratum	Relative abundance
	Eucalyptus dalrympleana (Upper)	4 trees inside plot 2 and 2 saplings inside plot 1
	Eucalyptus stellulata (Upper)	4 trees inside plot 2 and 2 saplings inside plot 1
	Bossiaea foliosa (Mid)	10 shrubs inside plot 2 and 1 shrub inside plot 1
Justification of evidence used to identify the PCT	Resources used to determine PCT • IBRA region and IBRA sub-region. • SEED Vegetation Mapping inside the development site. • Upper, mid and lower stratum species collected in BAM plots (as illustrated above) • PCTs filtered from the Vegetation Classification System Tool when entering the species above.	

	PCTs 1196, 679 & 639 were short listed and further investigated: • PCT 1196 was investigated because it was mapped across the site as per the SELLS vegetation mapping (inside the subject land). It did not have a strong floristic association with vegetation surveyed inside the BAM plots. Also, landscape was not a slope or ridge where it was more mountainous/steep in character. • The Vegetation Classification tool derived PCT 679 with the species above entered. Although PCT 679 had good canopy and groundcover associations with the species above, it does not contain *Bossiaea foliosa* which was dominating the mid stratum inside the development site. Landscape was not a low lying frosty hollow along a drainage line (as described for this PCT). • The Vegetation Classification tool derived PCT 639 with the species above entered. This was considered the strongest match for upper and mid stratum species and was chosen because it had *Bossiaea foliosa* and presence of less dominant groundcovers as well as reasonable landscape match being mountainous areas.
TEC Status	No NSW or Commonwealth listed TEC is associated with PCT 639.
Estimate of percent cleared within NSW	PCT 639 is ranked as 5% cleared, using data contained in the BioNET Vegetation Classification for the PCT.
Photos	 Zone 1 Areas containing trees, shrubs and native groundcovers (PCT 639 TreesShrubsGC). Note: shrubs can be seen in background of this photo and are patchy across the zone.

Zone 2 Areas containing a mix of native and exotic groundcovers (PCT 639 GC).

Figure 3-2 Plant Community Types for the development site

3.3 Vegetation Integrity Assessment

3.3.1 Vegetation zones and survey effort

From the surveys completed on 22nd March 2022, it was determined there was one PCT on site. This was PCT *Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion*'.

Table 3-2 Vegetation zones at the development site

Zone ID (BAM C)	PCT ID	Condition	Zone area (ha)	BAM plots required	BAM plots completed	Patch size (ha)
1	**639**	TreesShrubsGC (High)	0.67	1	1 plot (BAM Plot 2)	101
2	**639**	GC (Low)	0.33	1	1 plot (BAM Plot 1)	101

Figure 3-3 Vegetation zones at the development site

3.3.2 Vegetation integrity assessment results

The results of the plot field data can be found in Appendix A, (A.1) and plot photos (A.2). The plot data from the vegetation integrity survey plots were entered into the BAM calculator. The results of the vegetation integrity assessment from the BAM calculator are provided in Table 3-3 below.

Table 3-3 Current vegetation integrity scores for each vegetation zone within the development site

Zone ID	PCT/Zone	Composition score	Structure score	Function score	Vegetation Integrity Score
1	639	76.4	46.1	39.7	51.9
2	639	63.9	21.3	15.3	27.5

3.3.3 Use of more appropriate local data

No local data or more appropriate data was used in this assessment.

4. Threatened Species

4.1 Research and methodology

The tables below illustrate entities investigated under the BAM. They are a combination of entities derived from the BAM calculator (for PCT 639) and from using known Bionet Atlas records found within 10km of the subject land where habitat is suitable.

For the purposes of this streamlined assessment, no candidate species were incidentally detected onsite during survey.

4.2 Ecosystem Credit Species

The following table details ecosystem credits generated by the BAM-C for this proposal.

Table 4-1 Ecosystem credit species predicted by the BAM-C

Name	Associated Vegetation Zone	NSW Listing Status	National Listing Status
Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)	639_TreesShrubsGC 639_GC	Vulnerable	Not Listed
Gang-gang Cockatoo (Foraging) (*Callocephalon fimbriatum*)	639_TreesShrubsGC 639_GC	Vulnerable	Endangered
Varied Sittella (*Daphoenositta chrysoptera*)	639_TreesShrubsGC 639_GC	Vulnerable	Not Listed
Spotted-tailed Quoll *(Dasyurus maculatus)*	639_TreesShrubsGC 639_GC	Vulnerable	Endangered
Eastern False Pipistrelle (*Falsistrellus tasmaniensis*)	639_TreesShrubsGC 639_GC	Vulnerable	Not Listed
Little Eagle (Foraging) (*Hieraaetus morphnoides*)	639_TreesShrubsGC 639_GC	Vulnerable	Not Listed
White-throated Needletail	639_TreesShrubsGC 639_GC	Vulnerable	Not Listed

Name	Associated Vegetation Zone	NSW Listing Status	National Listing Status
(*Hirundapus caudactutus*)			
Square-tailed Kite (Foraging) (*Lophoictinia isura*)	639_TreesShrubsGC 639_GC	Vulnerable	Not Listed
Large Bent-winged Bat (Foraging) *(Miniopterus orianae oceanensis)*	639_TreesShrubsGC 639_GC	Vulnerable	Not Listed
Barking Owl (Foraging) (*Ninox connivens*)	639_TreesShrubsGC 639_GC	Vulnerable	Not Listed
Powerful Owl (Foraging) *(Ninox strenua)*	639_TreesShrubsGC 639_GC	Vulnerable	Not Listed
Olive Whistler *(Pachycephala olivacea)*	639_TreesShrubsGC 639_GC	Vulnerable	Not Listed
Yellow-bellied Glider (*Petaurus australis*)	639_TreesShrubsGC	Vulnerable	Not Listed
Scarlet Robin (*Petroica boodang*)	639_TreesShrubsGC 639_GC	Vulnerable	Not Listed
Flame robin *(Petroica phoenicea)*	639_TreesShrubsGC 639_GC	Vulnerable	Not Listed
Koala (Foraging) *(Phascolarctos cinereus)*	639_TreesShrubsGC	Vulnerable	Not Listed

4.3 Candidate Species at risk of SAII

The area expected to be disturbed by clearing/construction or asset protection for bushfire is up to 1ha inside the subject land and as such the Streamlined Assessment Tool in BAM C was utilised (Part 4 Development – small area) and this generates a simplified list of candidate species requiring further assessment. Under small area assessments, only species listed as 'Serious and

irreversible – SAII' require further investigation where they are confirmed to have suitable habitat inside the development site.

Only one SAII species was generated by the BAM C which was the Large Bent-winged Bat and is a dual credit species. Foraging habitat is covered off in the generation of ecosystem credits for this species. The presence of key breeding habitat (such as caves, tunnels, mines or other roosting structures) would trigger the need to conduct targeted survey to confirm presence or absence of the species. The development site does not contain any key breeding habitat features and therefore can be ruled out from requiring further assessment. Species credits will not be required for this species.

In addition to BAM C candidate species listed, existing BioNet atlas records (listed as 'SAII) were investigated within 1km of the development site to ensure a comprehensive assessment under the BAM. There was one record of the Orange-bellied Parrot (SAII listed). This species was investigated and it was concluded to be only one vagrant record and not normally distributed around Thredbo or surrounds (one record only 400m away from subject land) and not associated with the vegetation class or type found onsite. It was therefore excluded from further assessment under the BAM.

In conclusion, no targeted survey for any SAII listed candidate species is required for this project. Refer to Table 4-2 for the list of species assessed.

Table 4-2 Candidate species identified at risk of SAII and included/excluded from assessment

Species Credit Species (Streamlined Assessment)	Habitat components and geographic restrictions	Sensitivity to gain class	NSW Listing Status	National listing status	Habitat Components and abundance on site	Included or Excluded	Reason for Inclusion or exclusion
Large Bent-winged Bat (Breeding) (*Miniopteros orianae oceanensis*)	Caves, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records with microhabitat	Very High Sensitivity to Potential Gain	Vulnerable	Not Listed	No caves, tunnels culverts	Excluded	No breeding habitat components on site
Orange-bellied Parrot *(Neophema chrysogaster)* [added to BAM C because of one Bionet Atlas record found 400m SW of Subject Land]	Inhabits sheltered coastal habitats including bays, lagoons, estuaries, coastal dunes and saltmarshes.	Vulnerable	Not Listed	No caves, tunnels culverts	Unsuitable habitat inside Development site.	Excluded	Vagrant record from Bionet No suitable habitat

5. Prescribed Biodiversity Impacts

5.1.1 Occurrences of karst, caves, crevices and cliffs, rocks and other geological features

No occurrences of karst, caves, crevices, and cliffs were present on site.

5.1.2 Occurrences of human-made structures and non-native vegetation

There are no human made structures inside the subject land (that will be impacted). There are buildings abutting onto the subject land to the east and west. All vegetation is native.

5.1.3 Occurrences of habitat connectivity

The native vegetation inside the subject land forms part of a much larger remnant of native vegetation >100ha in area. Removal of native vegetation inside the subject land will not impact on any habitat corridors for threatened species.

5.1.4 Water bodies, water quality and hydrological processes

There is a first order watercourse running along the eastern boundary of the subject land according to the Strahler stream order watercourses on GIS. There is a minor first order watercourse running through the eastern portion of the lot. The stream did not appear to run through the subject land and was only observed on the northern boundary where it flows under the road.

5.1.5 Vehicle strike

The proposed development being a tourist accommodation building will contribute to an increase the volume of traffic using the Thredbo Village and Diggings Road. However, the speed limits on roads are already limited to 40km/hr meaning the likelihood of wildlife fatalities will be very small.

5.1.6 Conclusion to prescribed impacts

No prescribed impacts have been directly linked to this type of development. Some mitigation measures are provided in chapter 8.1 to avoid any potential impacts.

6. Avoid and Minimise Impacts

6.1 Avoiding and Minimising Impacts on Biodiversity Values

The subject land is currently vacant land sited between existing tourist accommodation buildings and is partially cleared of trees and shrubs (refer to Figure 1-1 for aerial photo showing existing Thredbo township infrastructure). The size of the lot 768 is 0.5ha where the construction footprint will be located. It is assumed all native vegetation will be removed.

The remaining 0.5ha (assessed as the development footprint) consists of native vegetation which will need to be managed for asset protection zones (APZs) to comply with bushfire regulations. Although APZs do not involve total clearing and some trees and isolated shrubs can remain, it was decided that full impacts should be assumed inside the proposed APZ to allow full flexibility in managing the land for bushfire hazard reduction measures. Allowing full impacts ensures that any activities necessary for protection of life and property can be managed without further approval required under the BOS. With the nature of development proposed, planning for bushfire protection principles must take precedence within areas surrounding habitable dwellings, if this development is approved under the EP& A Act.

6.1.1 Site selection – consideration of alternatives

Due to the subject land being located inside the National Park Reserve, there are limited alternative locations to accommodate this type of development. Most of the Thredbo village is already constructed with tourist accommodation limiting blocks which can be proposed for new buildings. Considering that the site is surrounded by National Park, confining new tourist development to the Thredbo village grounds is considered the option with least impacts on biodiversity and is confined to areas which have been previously disturbed by clearing.

This is consistent with the NSW Snowy Mountains Special Activation Precinct Master Plan, July 2022, which specifically identifies the site for new tourist accommodation on the basis that it is key disturbed site.

6.1.2 Proposal planning phase – detailed design

It was decided that full impacts should be assumed inside the proposed APZ to allow full flexibility in managing the land for bushfire hazard reduction measures including removal of Hollow bearing trees (HBTs). With this understanding, efforts will be made to preserve patches of trees and shrubs where possible to do so. Hollow-bearing trees will be given priority for retention and integrated into any landscaping designs for the development. HBTs 1, 2, 3 & 5 (Figure 3-3), where tree root stability can be assured after applying Australian Standard 4970 (Protection of trees on development sites). There are two advantages;

1. It retains the most important habitat features onsite which can still be utilized by hollow-dependant fauna (as well as offset under the BOS in case removal is required);
2. Provides aesthetic character to the development and keeping in theme with native trees existing inside the Thredbo village Head Lease Boundary.

Detailed landscaping will be carried out following completion of the development. Following tree removal, any replacement of trees within landscaping plans will ensure that endemic species are used, keeping in line with the PCT found onsite. Further details regarding landscaping is provided in Ch 8)

Figure 6-1 Final project layout

6.1.3 Site constraints

As the development site is inside Kosciusko National Park, any development must comply with the management plan for this National Park. In a planning context, the site is constrained to Thredbo Village township which is already well established with infrastructure including tourist accommodation buildings, tourist shops and alpine recreation related infrastructure.

In a landscape context, the site steeply descends to the north-west. Soils consist of erosive granite sands and bedrock which could be prone to erosion and scouring if erosion and sediment control is not managed in accordance with best management procedures (i.e., Landcom Bluebook). A construction management plan and erosion and sediment control plan will be required prior to any clearing onsite (including removal of groundcovers).

7. Assessment of Impacts

7.1 Direct Impacts

The construction and operational phases of the proposal have the potential to impact biodiversity values at the site on threatened entities that cannot be avoided. This would occur through direct impacts, such as habitat clearance and ongoing maintenance of infrastructure for bushfire hazard reduction and landscaping. These are summarised in Table 7-1 Potential impacts to biodiversity during the construction and operational phases of the development below.

Table 7-1 Potential impacts to biodiversity during the construction and operational phases of the development

Nature of impact	Extent (ha)	Frequency	Duration and timing	TEC, threatened species and habitats likely to be affected	Consequences
Direct impacts					
Permanent habitat removal to build ecotourist accommodation	0.5ha (half of the development footprint) includes; * 0.25ha of PCT 639 TreesShrubsGC * 0.24ha of PCT 639 GC	One off clearing event	Construction	Removal of native vegetation across the block removes potential breeding and foraging habitat for threatened entities	Loss of habitat for fauna Loss of native flora Possible injury/death of fauna Disturbance and removal of litter, logs, tree stumps, hollow bearing trees
Habitat removal for Bushfire Asset Protection	0.5ha (remaining half of the development footprint) includes; * 0.42ha of PCT 639 TreesShrubsGC * 0.09ha of PCT 639 GC	Multiple times to maintain area as an APZ.	Post construction, every 5-10 years	Removal of native vegetation that may provide potential breeding and foraging habitat for threatened entities	Loss of habitat for fauna Loss of native flora Possible injury/death of fauna Disturbance and removal of litter, logs, tree stumps, hollow bearing trees

Nature of impact	Extent (ha)	Frequency	Duration and timing	TEC, threatened species and habitats likely to be affected	Consequences
Displacement of local resident fauna	Unknown	Multiple	Pre-construction, construction, operation	Disturbance to foraging areas surrounding development for fauna	Displacement of foraging resources Loss of habitat and native fauna Displacement of native fauna causing death or injury elsewhere
Injury or death to fauna during construction	Unknown	Multiple	Construction, operation	Accidental injury or death from construction and ongoing site maintenance	Direct loss of native fauna Decline in local fauna populations
Changes to drainage from hardstand areas	Unknown	One-off, Construction	One-off, permanent change	Changes to subsurface drainage which may alter aquatic habitat resources (minor)	Impacts on aquatic flora and fauna species relying on current watercourse inside subject land

7.1.1 Changes in vegetation integrity scores

Vegetation integrity scores will go to zero for both vegetation zones assuming total impacts inside the development footprint. The current and future expected vegetation integrity scores are illustrated in Table 7-2 below.

Table 7-2 Current and future vegetation integrity scores for each vegetation zone within the development site

Zone ID	PCT/Zone	EEC or threatened Sp Habitat	Area (ha)	Area impacted (ha)	Current vegetation integrity score	Future vegetation integrity score
1	639 TreesShrubGC	No	0.67	0.67	51.9	0
2	639 GC	No	0.33	0.33	27.5	0

7.1.2 Loss of species credit species habitat or individuals

No assessment has been undertaken in this regard because all candidate species have been ruled out from further assessment. Refer to chapter 4.3 for justification of species excluded from further assessment.

7.1.3 Loss of hollow-bearing trees

There are five HBTs inside the subject land which could be impacted directly from construction onsite and it is assumed they will be removed. A table listing HBTs and additional information is found in Appendix C. It's possible that more HBTs are present outside of Lot 768 within the asset protection zone perimeter of the building envelope as HBTs were not mapped in this area during field survey. As such, pre-clearance surveys will be required as part of the mitigation measures prior to any construction onsite.

7.2 Indirect Impacts

Indirect impacts of the proposal include soil and water contamination, creation of barriers to fauna movement or the generation of excessive dust, light or noise onsite. Table 7-3 details the type, frequency, intensity, duration and consequence of the direct and indirect impacts of the proposal.

Table 7-3 Potential indirect impacts to biodiversity during the construction and operational phases

Nature of impact	Extent	Frequency	Duration Timing	TEC, threatened species and habitats likely to be affected	Consequence for bioregional persistence
Indirect impacts (those listed below are included in the BAM)					
Inadvertent impacts on adjacent habitat or vegetation	Unknown	Unknown	Construction Short time span	Foraging habitat for ecosystem credit species listed in table 4-1	- Degradation of foraging habitat over time - Disturbance to stags, fallen timber and - Increased edge effects
Reduced viability of adjacent habitat due to edge effects	Unknown	Constant	Operating development In perpetuity of development	No threatened species affected as assessed in BAM C	NA
Reduced viability of adjacent habitat due to noise, dust, heat or light spill	Unknown	Rare	Construction Short time span	No threatened species affected as assessed in BAM C	- Nature of impact is consistent with existing tourist accommodation existing next to subject site and siting of the development is not considered to cause further degradation on adjoining habitat.
Transport of weeds and pathogens from the site to adjacent vegetation	Unknown	Irregular	Construction and operation of development In perpetuity of development	Habitat for ecosystem credit species listed in table 4-1	- Degradation of foraging habitat over time - Disturbance to stags, fallen timber and - Increased edge effects
Increased risk of starvation,	Unknown	Rare	Construction and operation of development	Foraging habitat for ecosystem credit species listed in table 4-1	- Degradation of foraging habitat over time - Disturbance to stags, fallen timber and - Increased edge effects

exposure and loss of shade or shelter			In perpetuity of development		
Loss of breeding habitat	Unknown	Unknown	Construction	Breeding habitat for ecosystem credit species that rely on hollows listed in table 4-1	- Loss of potential fallen logs and HBTs for hollow dependant fauna - Loss of shrubs and midstory proving nesting opportunities for various fauna - Loss of groundcovers near aquatic areas
Earthworks and mobilisation of sediments	Unknown	Regular	Construction and operation of development During high rainfall events	No threatened species identified as assessed in BAM C	- NA
Increase in pest animal populations **(Pest animals could include an increase in rats, foxes, cats, rabbits)**	Unknown	Regular	Operation of the development Regular	Rats and rabbits could compete for food and refuge/breeding habitat with threatened species listed in table 4-1 Fox attacks on some species listed in table 4-1	- Competition for food within suitable foraging habitat for entities listed in table 4-1 - Increase in fatalities on threatened species listed in table 4-1 from fox and cat attacks
Rubbish dumping	Unknown	Regular	Operation of the development In perpetuity	Ecosystem credit species listed in table 4-1	- Degradation of habitat and may attract more pest predators leading to further loss of threatened species.

7.3 Prescribed Impacts

No prescribed impacts are associated with this development. No further assessment required.

7.4 Impacts to Biodiversity Values that are Uncertain

There are no biodiversity values that are uncertain for this proposed development.

7.5 Impacts to Matters of National Environmental Significance

An EPBC Act habitat evaluation (Appendix F) was undertaken for species predicted to occur within the broader study locality (10 km radius).

7.5.1 Threatened Ecological Communities

The protected matters search tool revealed three Threatened ecological communities (TECs) with potential to exist inside the study area. There were;

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Natural Temperate Grassland of the South Eastern Highlands
- Alpine Sphagnum Bogs and Associated Fens

Following the site inspection, it was concluded that none of these TECs exist inside the subject land and will not be impacted by the proposed development.

7.5.2 Threatened Species

The Protected Matters Search Tool (Appendix D) revealed 15 threatened flora and 29 fauna species have potential to occur inside the subject land. As such, a habitat evaluation was conducted for each individual flora and fauna species to determine whether suitable habitat and known records of species exist, to warrant further investigation through an assessment of significant impact. The habitat evaluation table can be found in Appendix E.

Of the 29 species broadly assessed, four required detailed assessment under an EPBC Act assessment of significant impact (Appendix F). Results of the assessments is provided below.

Gang-gang Cockatoo

The assessment concluded that there is unlikely to be a significant impact on Gang Gang cockatoos due to the minor scale of impacts and the large area of adjoining habitat preserved in the national park. Referral to the Commonwealth is not recommended.

Spotted-tail Quoll

The assessment concluded that there is unlikely to be a significant impact on Spotted-tailed Quolls due to the minor scale of impacts on foraging habitat only and the large area of adjoining habitat preserved in the national park. Referral to the Commonwealth is not recommended.

Koala

Koala was classified as 'endangered' back in February 2022 so has increased in its conservation status. The EPBC Act Referral Guidelines for the Koala (DoE 2014) documents the 'Koala habitat assessment tool' which can be used to assess impact on habitat critical to the survival of the Koala. This tool was utilised as it applies to the proposal (refer to table below the Habitat Evaluation – Appendix E). Impact areas that score five or more using this tool contain habitat critical to the survival of the Koala. The assessment resulted in a score of 7 and, as such, an 'assessment of significant impact' carried out under EPBC Act. Due to the small impact area of potential Koala habitat, the proposal is not expected to adversely affect habitat critical to the species as the subject land forms part of a much larger patch of native vegetation and suitable koala habitat exceeding 1000ha. No referral is recommended.

Broad-toothed Rat

The assessment concluded that there is unlikely to be a significant impact on the Broad-toothed Rat due to the minor scale of impacts and the large area of adjoining habitat preserved in the national park. Referral to the Commonwealth is not required.

7.5.3 Migratory Species

All the migratory species have a low likelihood of being impacted by the development based on the migratory species results in the MNES search. The EPBC habitat assessment is shown in Appendix F

7.6 Assumptions and Predictions

Areas comprising the subject land outside of Lot 768 and proposed for asset protection zones have not been ground truthed. The PCT is assumed to be the same as vegetation found inside Lot 768 and mapped according to presence or absence of trees using aerial photography. Hollow bearing trees have not been investigated in this area. The calculation of HBTs, in particular, size and number of hollows, was made from ground level. It is possible that some hollows are present that were not visible from ground level, which may result in underestimates of the number of hollows (Gibbons and Lindenmayer 2000). A map of hollow bearing trees inside the subject land can be seen on Figure 3-3.

It was considered that a second site inspection was not warranted based on the 'small areas' streamlined nature of this clearing proposal under the BAM.

8. Mitigating and Managing Impacts

8.1 Mitigation Measures

A summary of key measures required to mitigate the impacts of the proposal are provided below. Mitigation measures are proposed to manage impacts, including proposed techniques, timing, frequency, responsibility for implementing each measure, risk of failure, and an analysis of the consequences of any residual impacts are provided in Table 8-1 below.

Table 8-1 Mitigation measures proposed to avoid and minimise impacts on native vegetation and habitat

Mitigation measure	Proposed techniques	Timing	Frequency	Responsibility	Risk of failure	Risk and consequences of residual impacts
Displacement of resident fauna through vegetation clearing and habitat removal						
Time works to avoid critical life cycle events;	• Clearing should occur during Autumn (March to May) to avoid the peak breeding season for most wildlife and tourist peak season being June to October.	Construction.	Regular.	Contractor.	Moderate.	Species not detected during pre-clearing surveys may be impacted. Hollow bearing trees may have different fauna present at a later stage.
Implement tree clearing protocols including pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecological or wildlife handler	• Pre-clearing surveys by an ecologist or wildlife handler. • Tree clearing procedure including a fauna spotter/ecologist present during removal of hollow bearing trees, timed to avoid breeding periods for hollow dependent fauna such as Gang-gang Cockatoo, from September to February	Construction.	Regular.	Contractor.	Moderate.	Species not detected during survey but may be present on site
Relocate habitat features (fallen timber, hollow logs) where possible	• Fauna spotter or Ecologist to do this during tree removal works	Construction.	Regular.	Contractor.	Moderate.	Species not detected during pre-clearing surveys may be present on site
Indirect impacts on native vegetation and habitat						

Clearing protocols that identify vegetation to be removed, prevent inadvertent damage and reduce soil disturbance	• Approved clearing limits to be clearly delineated with temporary fencing or similar prior to construction commencing. • In areas to clear adjacent to areas to be retained, chainsaws would be used rather than heavy machinery to minimise risk of unauthorised disturbance.	Construction.	Regular.	Contractor.	Low.	Clearing may exceed what has been assessed and approved.
Adaptive dust monitoring programs to control air quality;	• Daily monitoring of dust generated by construction activities; and • Construction would cease if dust observed being blown from site until control measures were implemented; and • All activities relating to the proposal would be undertaken with the objective of preventing visible dust emissions from the development site.	Construction	Regularly	Contractor	Moderate	Sedimentation in waterways. Air pollution
Temporary fencing and signage to protect significant environmental features such as adjoining vegetation	• Prior to construction commencing, exclusion fencing, and signage would be installed around boundary to protect vegetation on adjoining properties	Construction	Regularly	Contractor	Low	Inadvertent removal of vegetation and fauna habitat off site
Installation of sediment controls to prevent sediment runoff into creek	• A sediment control plan would be prepared in conjunction with the final design and implemented; and • Spill management procedures would be implemented.	Construction	Regular	Contractor	Moderate	Impacts may occur to Thredbo River 74m downslope via stormwater detention if sedimentation control plan not implemented

Hygiene protocols to prevent the spread of weeds or pathogens between infested areas and un-infested areas; and	• A Weed Management procedure would be developed to prevent and minimise the spread of weeds for declared priority weeds under the *Biosecurity Act 2015* during and after construction; • Weed hygiene protocol in relation to plant, machinery, and fill; • Wash down site vehicles prior to entering the site; • Any occurrences of pathogens such as Chytrid Fungus and Phytophthora would be monitored, treated, and reported	Construction, Operation	Regular	Contractor	Moderate	Weed encroachment and introduction of pest fungus to a National Park
Staff training and site briefing to communicate environmental features to be protected and measures to be implemented.	• Site induction; and • Toolbox talks.	Construction	Regular	Contractor	Moderate	Impacts to native vegetation or threatened species if Staff training is not being followed
Prescribed biodiversity impacts						
Appropriate landscape plantings of local indigenous species to replace loss of vegetation	• Select indigenous plants and part of landscape planning	Construction	Regular.	Contractor.	Low	Minimal risk
Enforce site speed limits (40km) to reduce impacts of vehicle strikes on threatened fauna	• Traffic protocols as part of traffic management plan	Construction	Regular.	Contractor.	Low	Unnecessary injury or death of fauna

8.3 Adaptive Management Strategy for uncertain biodiversity impacts

Adaptive management during construction and after construction that may arise and monitoring is key to adaptive management. Environmental Construction Management Plans will list any management actions for flora and fauna, which will have an adaptive management component.

9. Serious and Irreversible Impacts (SAII)

The principles used to determine if a development will have serious and irreversible impacts, include impacts that:

- Will cause a further decline of the species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to be in a rapid rate of decline, or
- Will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to have a very small population size, or
- Impact on the habitat of a species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to have a very limited geographic distribution, or
- Impact on a species or ecological community that is unlikely to respond to measures to improve habitat and vegetation integrity and is therefore irreplaceable.

9.1 Potential Serious and Irreversible Impact Entities

9.1.1 Threatened ecological communities

There are no SAII listed threatened ecological communities impacted by this proposal.

9.1.2 Threatened species

Only two SAII listed entities (Large Bent-wing Bat and Orange-bellied Parrot) have been assessed under BAM and both are not going to be impacted by the proposed development. No additional entities require further consideration.

10. Offset Requirement

10.1 Impacts Requiring Offset

10.1.1 Ecosystem credits

An offset is required for all impacts of development on PCTs that are associated with:

a) a vegetation zone that has a vegetation integrity score ≥15 where the PCT is representative of an endangered or critically endangered ecological community, or

b) a vegetation zone that has a vegetation integrity score of ≥17 where the PCT is associated with threatened species habitat (as represented by ecosystem credits), or is representative of a vulnerable ecological community, or

c) a vegetation zone that has a vegetation integrity score ≥20 where the PCT is not representative of a TEC or associated with threatened species habitat.

The PCTs and vegetation zones requiring offset, and the ecosystem credits required, are documented in Table 10-1 and mapped on Figure 10-1.

Table 10-1 PCTs and vegetation zones that require offsets

Zone ID	PCT ID	Vegetation Zone Name	Credit Class	Zone Area (Ha)	Vegetation integrity score	Ecosystem credits required
1	639	TreesShrubsGC		0.67	51.9	13
2	639	GC		0.33	27.5	3
				Subtotal		**16**

10.1.2 Species credits

There are no candidate species generating species credits.

10.2 Impacts not Requiring Offset

There are no areas on the subject land that do not require an offset.

10.3 Areas not Requiring Assessment

There are no areas not requiring assessment under the BAM inside the subject land.

Figure 10-1 Impacts requiring offsets

10.4 Offsets required under the EPBC Act

No offsets are required under the EPBC Act.

11. Conclusion

The property at 5 Diggings Terrace, Thredbo proposes to clear 1 ha of native vegetation for tourist accommodation. The proposal must be submitted as a Development Application (DA) under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The area proposed for development is covered by native vegetation. It sums to an area of 1.0 hectare and because the clearing does not exceed 1ha, a small areas streamlined assessment BDAR (consistent with requirements set out under Appendix K of the BAM 20) was prepared. The development footprint includes areas that will be required for buildings, hard-stand and asset protection zones (bushfire hazard reduction) and areas for movement of machinery during construction and this has been assessed for total impacts under the BAM.

After the site survey was conducted, the PCTs on site were confirmed to be

- Vegetation Zone 1 (Trees-Shrubs-Groundcover): PCT 639, Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
- Vegetation Zone 2 (Groundcover only): PCT 639, Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion

PCT 639 is not listed as threatened ecological communities under the BC Act or the EPBC Act. Under the BC Act, the loss of native vegetation (PCT 639) generates a total of 16 ecosystem credits that will need to be retired prior to construction for the proposed development.

No species credits were generated. The two SAII species were assessed being the Large Bent-wing Bat and Orange-bellied Parrot. The Large Bent-wing Bat was ruled out because no breeding habitat was impacted and the Orange-bellied Parrot was ruled out because the one Bionet sighting close by was considered to be a vagrant record, not normally found within the locality.

In relation to Commonwealth assessment, an Assessment of Significance was completed for the Spot-tailed Quoll and Gang-gang Cockatoo, Koala and Broad-toothed Rat. The assessment of significance indicates that no EPBC listed species require referral and no offsets are required.

The retirement of these credits will be carried out in accordance with the NSW Biodiversity Offsets Scheme, and will be achieved by either:

a) Retiring credits under the Biodiversity Offsets Scheme based on the like-for-like rules, or
b) Making payments into the Biodiversity Conservation Fund using the offset payments calculator, or
c) Funding a biodiversity action that benefits the threaten entity(ies) impacted by the development.

12. References

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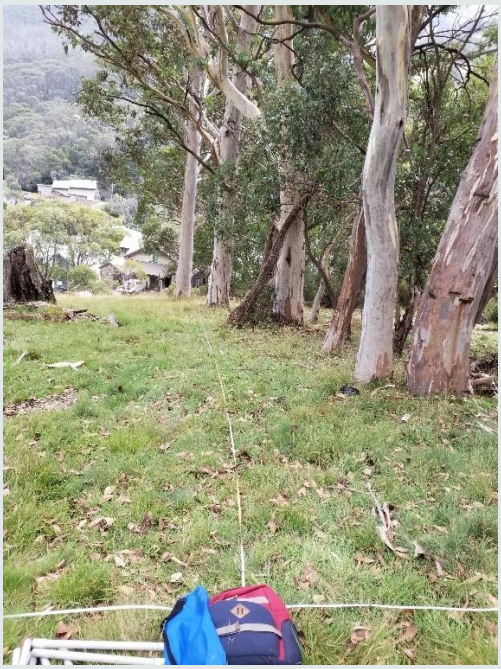
Appendix A SURVEY DATA

A.1 PLOT DATA

A.2 PLOT PHOTOS

Plot 1 (Groundcover – GC)	
Head of Plot	Litter 5 metres
	
Litter 15 metres	Litter 25 metres
	
Litter 35 metres	Litter 45 metres

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Plot 2 (Trees-Shrubs-GC)</td></tr>
<tr><td>Head of Plot</td><td>Litter 5 metres</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Litter 15 metres</td><td>Litter 25 metres</td></tr>
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Litter 35 metres

Litter 45 metres

Appendix B Credit reports

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00032604/BAAS17086/22/00032605	Prelim BAM Assessment Zone1Trees1 0-67 and zone2GC 0-33	16/06/2022
Assessor Name	Report Created	BAM Data version *
Gillian Young	26/08/2022	54
Assessor Number	BAM Case Status	Date Finalised
BAAS17086	Finalised	26/08/2022
Assessment Revision	Assessment Type	BOS entry trigger
2	Part 4 Developments (Small Area)	BOS Threshold: Area clearing threshold

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits

Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion												
1	639_Trees ShrubsGC	Not a TEC	51.9	51.9	0.67	PCT Cleared - 5%	High Sensitivity to Gain			1.50		13
2	639_GC	Not a TEC	27.5	27.5	0.33	PCT Cleared - 5%	High Sensitivity to Gain			1.50		3
											Subtotal	**16**
											Total	**16**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits

BAM Candidate Species Report

Proposal Details

Assessment Id 00032604/BAAS17086/22/00032605	Proposal Name Prelim BAM Assessment Zone1Trees1 0-67 and zone2GC 0-33	BAM data last updated * 16/06/2022
Assessor Name Gillian Young	Report Created 26/08/2022	BAM Data version * 54
Assessor Number BAAS17086	Assessment Type Part 4 Developments (Small Area)	BAM Case Status Finalised
Assessment Revision 2	Date Finalised 26/08/2022	BOS entry trigger BOS Threshold: Area clearing threshold

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat constraints

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00032604/BAAS17086/22/00032605	Prelim BAM Assessment Zone1Trees1 0 -67 and zone2GC 0-33	16/06/2022
Assessor Name	**Report Created**	**BAM Data version ***
Gillian Young	26/08/2022	54
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS17086	Part 4 Developments (Small Area)	Finalised
Assessment Revision	**BOS entry trigger**	**Date Finalised**
2	BOS Threshold: Area clearing threshold	26/08/2022

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Barking Owl	Ninox connivens	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
Eastern False Pipistrelle	Falsistrellus tasmaniensis	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
Flame Robin	Petroica phoenicea	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
Gang-gang Cockatoo	Callocephalon fimbriatum	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
Large Bent-winged Bat	Miniopterus orianae oceanensis	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion

Little Eagle	Hieraaetus morphnoides	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
Olive Whistler	Pachycephala olivacea	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
Powerful Owl	Ninox strenua	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
Scarlet Robin	Petroica boodang	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
Spotted-tailed Quoll	Dasyurus maculatus	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
Square-tailed Kite	Lophoictinia isura	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
Varied Sittella	Daphoenositta chrysoptera	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
White-throated Needletail	Hirundapus caudacutus	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion
Yellow-bellied Glider	Petaurus australis	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C

BAM Vegetation Zones Report

Proposal Details

Assessment Id	Assessment name	BAM data last updated *
00032604/BAAS17086/22/00032605	Prelim BAM Assessment Zone1Trees1 0-67 and zone2GC 0-33	16/06/2022
Assessor Name	**Report Created**	**BAM Data version ***
Gillian Young	26/08/2022	54
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS17086	Part 4 Developments (Small Area)	Finalised
Assessment Revision	**Date Finalised**	**BOS entry trigger**
2	26/08/2022	BOS Threshold: Area clearing threshold

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones

1	639_TreesShrubsGC	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion	TreesShrubsGC	0.67	1	
2	639_GC	639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion	GC	0.33	1	

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00032604/BAAS17086/22/00032605

Proposal Name
Prelim BAM Assessment Zone1Trees1 0-67 and zone2GC 0 -33

BAM data last updated *
16/06/2022

Assessor Name
Gillian Young

Assessor Number
BAAS17086

BAM Data version *
54

Proponent Names

Report Created
26/08/2022

BAM Case Status
Finalised

Assessment Revision
2

Assessment Type
Part 4 Developments (Small Area)

Date Finalised
26/08/2022

BOS entry trigger
BOS Threshold: Area clearing threshold

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion	Not a TEC	1.0	13	3	16

BAM Biodiversity Credit Report (Like for like)

639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Montane Wet Sclerophyll Forests This includes PCT's: 638, 639	Montane Wet Sclerophyll Forests <50%	639_TreesShrubsGC	Yes	13	Monaro, Bungonia, Crookwell, Kybeyan-Gourock, Monaro, Murrumbateman, Snowy Mountains and South East Coastal Ranges. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Montane Wet Sclerophyll Forests This includes PCT's: 638, 639	Montane Wet Sclerophyll Forests <50%	639_GC	No	3	Monaro, Bungonia, Crookwell, Kybeyan-Gourock, Monaro, Murrumbateman, Snowy Mountains and South East Coastal Ranges. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

BAM Biodiversity Credit Report (Like for like)

Credit Retirement Options

Like-for-like credit retirement options

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id

00032604/BAAS17086/22/00032605

Proposal Name

Prelim BAM Assessment Zone1Trees1 0-67 and zone2GC 0-33

BAM data last updated *

16/06/2022

Assessor Name

Gillian Young

Assessor Number

BAAS17086

BAM Data version *

54

Proponent Name(s)

Report Created

26/08/2022

BAM Case Status

Finalised

Assessment Revision

2

Assessment Type

Part 4 Developments (Small Area)

Date Finalised

26/08/2022

BOS entry trigger

BOS Threshold: Area clearing threshold

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

BAM Biodiversity Credit Report (Variations)

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion	Not a TEC	1.0	13	3	16.00

639-Alpine Ash - Snow Gum shrubby tall open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Montane Wet Sclerophyll Forests This includes PCT's: 638, 639	Montane Wet Sclerophyll Forests <50%	639_TreesShrubsGC	Yes	13	Monaro,Bungonia, Crookwell, Kybeyan-Gourock, Monaro, Murrumbateman, Snowy Mountains and South East Coastal Ranges. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Montane Wet Sclerophyll Forests This includes PCT's: 638, 639	Montane Wet Sclerophyll Forests <50%	639_GC	No	3	Monaro,Bungonia, Crookwell, Kybeyan-Gourock, Monaro, Murrumbateman, Snowy Mountains and South East Coastal Ranges. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Variation options					
	Formation	Trading group	Zone	HBT	Credits	IBRA region
	Wet Sclerophyll Forests (Grassy sub-formation)	Tier 4 or higher threat status	639_TreesShrubsGC	Yes (including artificial)	13	IBRA Region: South Eastern Highlands, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Wet Sclerophyll Forests (Grassy sub-formation)	Tier 4 or higher threat status	639_GC	No	3	IBRA Region: South Eastern Highlands, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like options

Appendix C Hollow-bearing trees (HBTs)

HBT ID	Species	Estimated DBH (cm)	Large Trunk Hollow	Medium Trunk Hollow	Small Trunk Hollow	Large Limb Hollow	Medium Limb Hollow	Small Limb Hollow	Notes about hollow
1	E.dalrympleana	60						1	-
2	E. stellulata	35					1		2m up trunk
3	E dalrympleana	65				1		1	Just outside development footprint
4	E dalrympleana	70	1						Hollow has good depth
5	E rubida	35		5					-

Appendix D EPBC Act Protected Matters Search

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

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

Report created: 07-Jun-2022

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	2
Wetlands of International Importance (Ramsar	8
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	44
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	17
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	1
Nationally Important Wetlands:	1
EPBC Act Referrals:	6
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places			[Resource Information]
Name	State	Legal Status	Buffer Status
Historic			
Snowy Mountains Scheme	NSW	Listed place	In feature area
Natural			
Australian Alps National Parks and Reserves	ACT	Listed place	In feature area

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	700 - 800km upstream from Ramsar site	In buffer area only
Barmah forest	200 - 300km upstream from Ramsar site	In buffer area only
Blue lake	Within Ramsar site	In feature area
Gunbower forest	300 - 400km upstream from Ramsar site	In buffer area only
Hattah-kulkyne lakes	500 - 600km upstream from Ramsar site	In buffer area only
Nsw central murray state forests	200 - 300km upstream from Ramsar site	In buffer area only
Riverland	700 - 800km upstream from Ramsar site	In buffer area only
The coorong, and lakes alexandrina and albert wetland	700 - 800km upstream from Ramsar site	In buffer area only

Listed Threatened Ecological Communities			[Resource Information]

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

Community Name	Threatened Category	Presence Text	Buffer Status

Community Name	Threatened Category	Presence Text	Buffer Status
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community known to occur within area	In feature area
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community may occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area	In buffer area only

Listed Threatened Species [Resource Information]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area	In buffer area only
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
FISH			
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area	In buffer area only
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In buffer area only
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat likely to occur within area	In feature area
FROG			
Litoria spenceri Spotted Tree Frog [25959]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Litoria verreauxii alpina Alpine Tree Frog, Verreaux's Alpine Tree Frog [66669]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pseudophryne corroboree Southern Corroboree Frog [1915]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Burramys parvus Mountain Pygmy-possum [267]	Endangered	Species or species habitat known to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Mastacomys fuscus mordicus			
Broad-toothed Rat (mainland), Tooarrana [87617]	Vulnerable	Species or species habitat known to occur within area	In feature area
Petauroides volans			
Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Petaurus australis australis			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Petrogale penicillata			
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Pseudomys fumeus			
Smoky Mouse, Konoom [88]	Endangered	Species or species habitat known to occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In buffer area only
PLANT			
Argyrotegium nitidulum			
Shining Cudweed [82043]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Calotis glandulosa			
Mauve Burr-daisy [7842]	Vulnerable	Species or species habitat may occur within area	In feature area
Colobanthus curtisiae			
Curtis' Colobanth [23961]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Glycine latrobeana			
Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area	In feature area
Pimelea bracteata [8125]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pomaderris pallida Pale Pomaderris [13684]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Prasophyllum bagoense Bago Leek-orchid [84276]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Prasophyllum petilum Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area	In feature area
Pterostylis oreophila Blue-tongued Orchid, Kiandra Greenhood [22903]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Ranunculus anemoneus Anemone Buttercup [14889]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Rytidosperma pumilum Feldmark Grass [66716]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Cyclodomorphus praealtus Alpine She-oak Skink [64721]	Endangered	Species or species habitat known to occur within area	In feature area
Liopholis guthega Guthega Skink [83079]	Endangered	Species or species habitat known to occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
[Neophema chrysostoma](#) Blue-winged Parrot [726]		Species or species habitat likely to occur within area overfly marine area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhipidura rufifrons			
Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Kosciuszko	National Park	NSW	In feature area

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
Southern RFA	New South Wales	In feature area

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Blue Lake (Kosciuszko)	NSW	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Snowies Iconic Walk	2019/8558	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Aerial baiting for wild dog control	2006/2713	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Aerial dog baiting	2006/2791	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

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

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Appendix E EPBC Act Habitat Evaluation (as of 7th February 2022)

Presence of habitat:
- Present: Potential or known habitat is present within the study area
- Absent: No potential or known habitat is present within the study area

Likelihood of occurrence
- Unlikely: Species known or predicted within the locality but unlikely to occur in the study area
- Possible: Species could occur in the study area
- Present: Species was recorded during the field investigations

Possible to be impacted
- No: The proposal would not impact this species or its habitats. No Assessment of Significance (AoS) is necessary for this species
- Yes: The proposal could impact this species or its habitats. An AoS has been applied to these entities

Listing under EPBC (Column 2)
Critically Endangered (CE), Endangered (E), Vulnerable (V)

Species	EPBC Act Listing	Description of habitat	Number of records within 10km (Bionet)	Presence of habitat	Likelihood of occurrence	Possible impact?
THREATENED ECOLOGICAL COMMUNITIES						
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CE	Woodland habitat identified by occurrence of White Box, Yellow Box and/or Blakely's Red Gum and a generally grassy understorey. Trees may occur as pure stands, mixtures of the three species or in mixtures with other trees, including wattles. Generally, occur on fertile lower parts of the landscape where soil fertility is relatively high compared to the surrounding landscape.	NA	Absent	Unlikely	No
Natural Temperate Grassland of the South Eastern Highlands	CE	Natural Temperate Grassland (NTG) is a natural grassland community dominated by a range of perennial grass species and daisies, peas, lilies, orchids and plants in many other families, collectively known as forbs. There are eight sub-associations of NTG. The community is often treeless, though trees of a range of species can occur in low densities as isolated individuals or in clumps. Seasonally wet areas	NA	Absent (native vegetation is derived from a forested vegetation community)	Unlikely (native vegetation is derived from a forested vegetation community)	No

		within a site may also contain a range of wetland flora species, including rushes, sedges and a variety of wetland specialist forbs. A limited range of shrub species may occur at some sites, but these too occur in low densities.				
Alpine Sphagnum Bogs and Associated Fens	E	The Alpine Sphagnum Bogs and Associated Fens is alpine vegetation with its most typical assemblage comprising Sphagnum spp., *Baloskion australe, Carex gaudichaudiana* and *Empodisma minus*. It's defined by the presence or absence of Sphagnum spp., the most common of which is Sphagnum cristatum covers more than 30% of the ground (Kirkpatrick, 1997). Occasionally dominated by shrubs or Restionaceae spp., where Sphagnum spp. are only a minor component, and others where Sphagnum has been depleted or lost due to disturbance. Found in permanently wet areas along streams, valley edges and valley floors and can be found on slopes where soils are waterlogged (Costin et al., 2000; Slattery, 1998). The TEC must have good supply of groundwater and an impeded drainage that keeps the water table at or near the surface. They are found across alpine, subalpine and montane environments, often (but not always) above the climatic tree line. From a geographical perspective, alpine and subalpine regions are found above 1600 metres above sea level (asl) on the mainland.	NA	Absent	Unlikely	No
FLORA						
Pterostylis oreophila **(Blue-tongued Orchid)**	CE	In New South Wales, the Blue-tongued Greenhood is known from a few small populations within Kosciuszko National Park. Grows along sub-alpine watercourses under more open thickets of Mountain Tea-tree in muddy ground very close to water. Less commonly grows in peaty soils and sphagnum mounds.	1 (9km away)	Absent	Unlikely	No
Prasophyllum bagoense **(Bago Leek-orchid)**	CE	Bago Leek Orchid is a tuberous ground orchid with leaves that normally regenerate from underground tubers each year in spring. Currently known from a single population on land covered by a Crown Lease on State Forest near	0	Absent	Unlikely	No

		Tumbarumba on the Southern Tablelands of NSW. Found in grassy, low heathland dominated by *Poa clivicola, Epacris gunnii* and *E. celata* on a subalpine plain bordered by Snow Gum and Mountain Gum.				
***Pimelea bracteate* (no common name)**	CE	*Pimelea bracteata* is a shrub to 2 m tall, with hairless stems. The main areas of occurrence of *P. bracteata* are in the northern area of Kosciuszko National Park, Scabby Range Nature Reserve, neighbouring State Forests and freehold land. Occurs in wetlands and along waterways and stream edges in high altitude treeless subalpine valleys. It can also occur in wet heathland and closed heath.	0	Absent (no wetlands inside subject land)	Unlikely	No
***Leucochrysum albicans subsp. tricolor* (Hoary Sunray)**	E	Small native paper daisy. Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. Can occur in modified habitats such as semi-urban areas and roadsides. Highly dependent on the presence of bare ground for germination. In some areas, disturbance is required for successful establishment.	0	Present	Unlikely	No
***Prasophyllum petilum* (Tarengo Leek Orchid)**	E	Small grassland orchid growing in Natural Temperate Grassland, associated with Austrodanthonia spp. (Boorowa, Delegate). Also grows in grassy woodland in association with River Tussock *Poa labillardieri*, Black Gum *Eucalyptus aggregata* and tea-trees *Leptospermum* spp. near Queanbeyan and within the grassy ground layer dominated by Kangaroo Grass under Box-Gum Woodland at Ilford (and Hall, ACT).	0	Absent, vegetation derived from forested community not NTG	Unlikely	No
***Calotis glandulosa* (Mauve Burr-daisy)**	V	Found in montane and subalpine grasslands in the Australian Alps. Found in subalpine grassland (dominated by *Poa* spp.), and montane or natural temperate grassland dominated by Kangaroo Grass (*Themeda australis*) and Snow Gum (*Eucalyptus pauciflora*) Woodlands on the Monaro and Shoalhaven area. Appears to be a coloniser of bare patches, which explains why it often occurs on roadsides.	0	Present	Unlikely	No
Haloragis exalata subsp. exalata	V	Occurs in 4 widely scattered localities in eastern NSW. It is disjunct from the Central Coast, South Coast and North	0	Absent	Unlikely	No

(Wingless Raspwort)		Western Slopes botanical subdivisions of NSW. Square Raspwort appears to require protected and shaded damp situations in riparian habitats. Flowering specimens in NSW are recorded from November to January.				
Pomaderris pallida **(Pale Pomaderris)**	V	Pale Pomaderris is a compact, rounded shrub to 1.5 m tall. Recorded near Nimmitabel, Tinderry Nature Reserve, Queanbeyan River (near Queanbeyan), Shoalhaven River (between Bungonia and Warri), the Murrumbidgee River west of the ACT and the Byadbo area in Kosciuszko National Park. It is also found along the Murrumbidgee River in the ACT and has been recently recorded in eastern Victoria. Ideal habitat is surrounded by Brittle Gum (*Eucalyptus mannifera*) and Red Stringybark (*E. macrorhyncha*) or *Callitris* spp. woodland.	0	Absent	Unlikely	No
Xerochrysum palustre **(Swamp Everlasting)**	V	Native daisy to 1m in height. 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. Re-sprouts after fires. Sometimes grows in bogs with *Sphagnum*.	0	Absent	Unlikely	No
Rytidosperma pumilum **(Feldmark Grass)**	V	Felmark Grass is limited 3ha patch on the Main Range of Kosciuszko National Park between Mt Northcote and Mt Lee. Only found only in the feldmark - the sparse low vegetation of the bare rocky alpine slopes and ridges, one of the harshest environments in Australia. There is little snow cover in winter because the prevailing westerly winds blow it off into lee snow patches. The absence of snow cover means that extremely low temperatures and strong winds are experienced for long periods during winter. Surface soil temperatures are high in summer and soil moisture levels are often limiting at that time. This species presumably resprouts following disturbance, is remarkably tolerant of low temperature and has a limited capacity for dispersal of seeds to other areas of similar habitat nearby.	69	Absent	Unlikely	No

***Thesium australe* (Australe Toadflax)**	V	Small, straggling herb to 40 cm tall. Leaves are pale green to yellow-green, somewhat succulent. Flowers are minute and white, appearing in Spring. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often hidden amongst grasses and herbs.	0	Present (native groundcovers)	Unlikely	No
***Argyrotegium nitidulum* (Shining Cudweed)**	V	Shining Cudweed is found only in the higher parts of Kosciuszko National Park. Usually found in herbfield or open heathland, above or close to the tree line.	13	Absent	Unlikely	No
Ranunculus anemoneus (Amemone Buttercup)	V	The Anemone Buttercup occurs in a narrow band, only about 8km wide and 32km long, along the Great Dividing Range within Kosciuszko National Park (comprising the Main Range between Mt Kosciuszko and Mt Twynam; the Charlottes Pass resort; the Mt Perisher - Mt Blue Cow area; the Guthega - Mt Tate area; the Schlink Pass - Gungarten Pass area, the Rams Head Range and Upper parts of Thredbo, and Mt Jagungal). The Anemone Buttercup generally occurs in environments with late melting snow; on south to east facing, steep grassy slopes, or rocky crevices, or short alpine herbfields. The species has also been collected along watercourses, in grassland, heathland (below snow patches) and on roadside batters. Soils at Anemone Buttercup sites include loams (alpine humus soils), peats and decomposing granite.	857 (multiple records, nearest is 2.5km north west of study area, all within higher elevation alpine zone)	Absent – no alpine herbfield inside subject land. Vegetation consists of woodland	Unlikely	No
Colobanthus curtisiae (Curtis'Colobanth)	V	Small alpine forb found in alpine herbfields, associated with Anemone Buttercup.	0	Absent	Unlikely	No
***Glycine latrobeana* (Clover Glycine)**	V	The Clover Glycine is endemic to south-eastern Australia, where it is widely distributed from Port Pirie in South Australia, through much of Victoria to near Hobart in Tasmania. It was recently discovered in Kosciuszko National Park.	0	Present	Unlikely	No

		The Clover Glycine occurs in grassland and grassy woodland habitats, less often in dry forests, and only rarely in heathland. Populations occur from sea level to c. 1,200 m altitude (900 m in Tasmania). In Victoria, plants grow in a range of soil types including alluvial soils, and those derived from sandstones, mudstones, granite and basalt. Soils are usually clay but can also have high loam content. Tasmanian populations occur on a well-drained basalt, dolerite or sandstone substrates (Lynch 1994). The NSW population is in subalpine grassland (at about 1300 m asl).				
FAUNA						
Anthochaera Phrygia (Regent Honeyeater)	CE	Inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast. Birds are occasionally seen on the south coast.	0	Absent (no woodland containing box gums)	Unlikely	No
Numenius madagascariensis (Eastern Curlew)	CE	Migratory species which breeds in Russia. The Eastern Curlew has a primarily coastal foraging distribution in all states, particularly the north, east, and south-east regions including Tasmania. Eastern Curlews are rarely recorded inland. Occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts.	0	Absent	Unlikely	No
Lathamus discolor (Swift Parrot)	CE	Migrates to the mainland of Australia after breeding in Tasmania. They occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Species favoured for feeding include Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Forest Red Gum *E. tereticornis*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens,* Inland Grey Box *E. microcarpa,* Grey Box *E. moluccana,* Blackbutt *E. pilularis,* and Yellow Box *E. melliodora.*	0	Absent	Unlikely	No

Calidris ferruginea (Curlew Sandpiper)	E	The Curlew Sandpiper is a small, gregarious shorebird which breeds in Siberia and migrates to Australia preferring littoral and estuarine habitats, in particular the Hunter estuary and freshwater wetlands in the Murray-Darling Basin. It's found long the entire coast of NSW in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland.	0	Absent	Unlikely	No
Rostratula australis (Australian Painted Snipe)	E	The Australian Painted Snipe is restricted to Australia preferring swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella, wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys.	0	Absent	Unlikely	No
Callocephalon fimbriatum (Gang-gang Cockatoo)	**E**	**In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. Usually found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. May also occur in sub-alpine Snow Gum (*Eucalyptus pauciflora)* woodland and occasionally in temperate rainforests. Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 10 cm in diameter or larger in eucalypts.**	**35**	**Present (sub-alpine snow gum WL exists inside study area)**	**Likely (known records exist 410m south west of subject land)**	**Yes (possibility of removing 2 hollows inside subject land with potential for more trees)**
Pycnoptilus floccosus (Pilotbird)	V	Pilotbirds are endemic to south-east Australia. Upland Pilotbirds occur above 600 m in the Brindabella Ranges in the Australian Capital Territory, and in the Snowy Mountains in New South Wales and north-east Victoria. They are strictly terrestrial, living on the ground in dense forests with heavy undergrowth and are largely sedentary, seen hopping briskly over the forest floor and foraging on damp ground or among leaf-litter.	0	Absent	Unlikely	No

Hirundapus caudacutus (White-throated Needletail)	V	The White-throated Needletail breeds from June-August in south-eastern Siberia, Mongolia, the Korean Peninsula and northern Japan. They then migrate to Australia and are usually found foraging on the wing and are often seen before storms, low pressure troughs and approaching cold fronts and occasionally bushfire. These conditions are often used by insects to swarm (e.g., termites and ants) or tend to lift insects away from the surface which favours sighting of White-throated Needletails as they feed. More common in coastal areas, less so inland.	8	Present however no impacts likely from proposed activity	Unlikely	No
Falco hypoleucos (Grey Falcon)	E	Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. It utilises old nests of other birds of prey and ravens, usually high in a living eucalypt near water or a watercourse.	0	Absent	Unlikely	No
Grantiella picta (Painted Honeyeater)	V	Almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*.	0	Absent	Unlikely	No
Maccullochella macquariensis (Trout Cod)	E	Endemic to the southern Murray-Darling river system, including the Murrumbidgee and Murray Rivers, and the Macquarie River in central NSW.	0	Absent (no aquatic habitat)	Unlikely	No
Macquaria australasica (Macquarie Perch)	E	In the Murray-Darling Basin, the species was once typically found in the cool, upper reaches of drainage systems located in southern New South Wales, the Australian Capital Territory and northern Victoria.	0	Absent (no aquatic habitat)	Unlikely	No

Prototroctes maraena (Australian Grayling)	V	Historically known to occur in coastal catchments greater than 200 m above sea level (ASL), generally in the freshwater, estuarine and marine reaches of waterways in south-eastern Australia along New South Wales (NSW), Victoria, Tasmania (including on King Island in the Bass Strait) and South Australia (SA)	0	Absent (no aquatic habitat)	Unlikely	No
Maccullochella peelii (Murray Cod)	V	The Murray Cod occurs within the Murray-Darling Basin The species is a top order aquatic predator and has suffered substantial decline in abundance since European settlement, particularly in the last 70 years due to habitat loss and degradation, barriers to fish passage, flow regulation, cold water releases and fishing (legal and illegal).	0	Absent (no aquatic habitat)	Unlikely	No
Pseudophryne corroboree (Southern Corroboree Frog)	CE	The Southern Corroboree Frog is limited to sphagnum bogs of the northern Snowy Mountains, in a strip from the Maragle Range in the north-west, through Mt Jagungal to Smiggin Holes in the south. Its range is entirely within Kosciuszko National Park. Breeding habitat is pools and seepages in sphagnum bogs, wet tussock grasslands and wet heath. Outside the breeding season adults move away from the bogs into the surrounding heath and snow gum woodland to overwinter under litter, logs and dense groundcover.	1	Present (overwinter habitat only)	Unlikely (lack of leaf litter and niche overwintering habitat)	No
Litoria spenceri (Spotted Tree Frog)	CE	This species occurs on the New England Tableland, and on the southern and central tablelands from Bathurst to Bombala. Following the chytrid virus pandemic it went unrecorded for 30 years and believed extinct, until rediscovered in 2009 on the Southern Tablelands near Yass which to present day remains the only known extant site of the species. Habitat is large permanent ponds or slow flowing 'chain-of-ponds' streams with abundant emergent vegetation such as bulrushes and aquatic vegetation.	0	Absent	Unlikely	No
Litoria verreauxii alpina (Alpine Tree Frog)	E	The Alpine Tree Frog occurs in the south-eastern NSW and Victorian high country (alpine and sub-alpine zones) above 1100 m asl. Most locations are within National Park and some are close to alpine resorts. Found in a wide variety of habitats including woodland, heath, grassland and herb	4	Present (over wintering habitat only)	Unlikely (lack of microhabitat including flat rocks, fallen	No

		fields. Breed in natural and artificial wetlands including ponds, bogs, fens, streamside pools, stock dams and drainage channels that are still or slow flowing. Overwintering refuges are poorly known but are likely to include flat rocks, fallen logs, leaf litter and other ground debris.			logs, leaf litter)	
Burramys parvus (Mountain Pygmy-possum)	E	Mountain Pygmy-possum lives only in alpine and subalpine areas on the highest mountains of Victoria and NSW. In NSW the entire range is in a 30 km by 8 km area of Kosciuszko National Park between Thredbo and Kerries Ridge, where it occupies less than four square kilometres of habitat. The total population size is less than 500 adults. Lives on the ground in rocky areas where boulders have accumulated below mountain peaks; frequently associated with alpine heathland shrubs dominated by the Mountain Plum-pine (*Podocarpus lawencei*). Daily movements between habitat patches can be up to 1 km for females and 3 km for males	129	Absent	Unlikely (existing records located ~2km away within higher alpine areas)	No
Dasyurus maculatus (SE mainland population) (Spotted-tailed Quoll)	**V**	**It is now found in eastern NSW, eastern Victoria, south-east and north-eastern Queensland, and Tasmania. Only in Tasmania is it still considered relatively 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. Quolls use hollow-bearing trees, fallen logs, other animal burrows, small caves and rock outcrops as den sites.**	**2**	**Present**	**Possible**	**Yes**
Pseudomys fumeus (Smoky Mouse)	CE	The Smoky Mouse is currently limited to a small number of sites in Victoria, south-east NSW and ACT. There are 3 records from Kosciuszko National Park. The Smoky Mouse appears to prefer heath habitat on ridge tops and slopes in sclerophyll forest, heathland and open-forest from the coast (in Victoria) to sub-alpine regions of up to 1800 metres, but sometimes occurs in ferny gullies. Nesting burrows have been found in rocky localities among tree roots and under the skirts of Grass Trees *Xanthorrhoea* spp.	0	Present	Unlikely (no known records inside 10km search area)	No

Phascolarctos cinereus (Koala)	**E**	**The Koala has a fragmented distribution throughout eastern Australia. In New South Wales, koala populations are found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range. There has been recent sightings of Koalas in Byadbo wilderness in Kosciuszko NP.**	**1**	**Present (0.5ha of treed habitat)**	**Unlikely – no recent records inside 10km radius**	**Yes, refer to Koala Habitat Assessment tool below this table**
Petrogale penicillate (Brush-tailed Rock-wallaby)	E	Extends from south-east Queensland to the Grampians in western Victoria. It has declined significantly in the west and south and has become more fragmented. In NSW they occur from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit.	0	Absent	Unlikely (Shoalhaven is southern limit for NSW population)	No
Pteropus poliocephalus (Grey-headed Flying-fox)	V	Grey-headed Flying-foxes are generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. In times of natural resource shortages, they may be found in unusual locations. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	0	Absent	Unlikely	No
Petaurus australis (Yellow-bellied Glider)	V	The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.	0	Absent (no tall mature forest providing ideal habitat)	Unlikely	No
Petauroides Volans (Greater Glider)	V	The Greater Glider occurs in eucalypt forests and woodlands along the east coast of Australia from north east Queensland to the Central Highlands of Victoria. Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelter during the day in tree hollows and will use up to 18 hollows in their home range.	0	Present	Unlikely	No
Mastacomys fuscus mordicus	**V**	**Broad-toothed Rat occurs in two widely separated areas: the wet alpine and subalpine heaths and woodlands in**	**71**	**Present (woodland**	**Likely (known**	**Yes**

(Broad-toothed Rat)		**Kosciuszko National Park, adjacent Nature Reserves (Bimberi and Scabby NR) and State Forest (Buccleuch SF) in the south of the State, and on the Barrington Tops, north-west of Newcastle. In Victoria - South Gippsland and the Otways - and western Tasmania, it can be found in wet sedge and grasslands at lower elevations. Lives in a complex of runways through the dense vegetation, wet grass, sedge or heath environment, and under the snow in winter. This relatively warm under-snow space enables it to be active throughout winter.**		**habitat exists inside subject land)**	**records 340m south west of subject land)**	
Cyclodomorphus praealtus (Alpine She-oak Skink)	E	The Alpine She-oak Skink is endemic to NSW and Victoria, where it is restricted to sub-alpine and alpine grasslands. In NSW, the Alpine She-oak Skink has only been observed within Kosciuszko National Park between Smiggin Holes and Kiandra. It has specific habitat requirements, preferring tree-less or very lightly treed areas that contain tussock grasses, low heath or a combination of both. Within this habitat the species shelters beneath litter, rocks, logs and other ground debris, and has been observed basking on grass tussocks. In NSW, Alpine She-oak Skinks have been observed in alpine to sub-alpine grasslands in flat to gently sloping areas.	46 (records over 4km to south west)	Marginal (Habitat is grassland and Woodland)	Unlikely (no localised populations recorded around Thredbo Village)	No
Liopholis Guthega (Guthega Skink)	E	The Guthega Skink is restricted to locations above 1600 m in the Australian Alps, in the vicinity of Mt Kosciuszko, NSW, and the Bogong High Plains, Victoria.	63	Absent (subject land is located at 1400 ASL)	Unlikely due to non-optimal elevation	
Aprasia parapulchella (Pink-tailed Worm-lizard)	V	Only known from the Central and Southern Tablelands, and the South Western Slopes. There is a concentration of populations in the Canberra/Queanbeyan Region. Other populations have been recorded near Cooma, Yass, Bathurst, Albury and West Wyalong. This species is also found in the Australian Capital Territory. Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*). Commonly found beneath small, partially-embedded rocks and appear to spend considerable	0	Marginal (lack of loose rock but native grass cover present)	Unlikely (no records within 10km)	No

		time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites.				

Koala habitat assessment tool for inland areas (DoE 2014)

Attribute	Score	Inland	Applicable to the proposal?
Koala occurrence	+2 (high)	Evidence of one or more koalas within the last 5 years.	
	+1 (medium)	Evidence of one or more koalas within 2 km of the edge of the impact area within the last 10 years.	
	0 (low)	None of the above.	0
Vegetation composition	+2 (high)	Has forest, woodland or shrubland with emerging trees with 2 or more known koala food tree species, **OR** 1 food tree species that alone accounts for >50% of the vegetation in the relevant strata.	
	+1 (medium)	Has forest, woodland or shrubland with emerging trees with only 1 species of known koala food tree present.	1
	0 (low)	None of the above.	
Habitat connectivity	+2 (high)	Area is part of a contiguous landscape ≥ 1000 ha.	2
	+1 (medium)	Area is part of a **contiguous landscape** < 1000 ha, but ≥ 500 ha.	
	0 (low)	None of the above.	
Key existing threats	+2 (high)	Little or no evidence of koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence. Areas which score 0 for koala occurrence and have no dog or vehicle threat present	2 Little to no evidence of koala mortality from dog or vehicle strike. Dogs prohibited inside NP.
	+1 (medium)	Evidence of infrequent or irregular koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence, **OR** Areas which score 0 for koala	

Attribute	Score	Inland	Applicable to the proposal?
		occurrence and are likely to have some degree dog or vehicle threat present.	
	0 (low)	Evidence of frequent or regular koala mortality from vehicle strike or dog attack in the study area at present, **OR** Areas which score 0 for koala occurrence and have a significant dog or vehicle threat present.	
Recovery value	+2 (high)	Habitat is likely to be important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1.	2 As the area comprises National Park it is considered likely to be important for ongoing conservation of Koalas
	+1 (medium)	Uncertain whether the habitat is important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1.	
	0 (low)	Habitat is unlikely to be important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1.	
Total	**7**	**Decision: Habitat may be critical to the survival of the Koala — assessment of significance required**	

Appendix F EPBC Act Assessment of Significant Impact

From the EPBC Act habitat assessment, the species that may be directly or indirectly impacted by the proposed are:

- Gang-gang Cockatoo (*Callocephalon fimbriatum*) - Endangered
- Spot-tailed Quoll (*Dasyurus maculatus maculatus)* Endangered
- Koala (*Phascolarctos cinereus*) - Endangered
- Broad-toothed Rat (*Mastacomys fuscus*) – Vulnerable

These species were chosen for an assessment of significant impact based on the habitat evaluation table provided in **Error! Reference source not found.**. The assessment of significance i mpact questions for these two species are listed below. These species require further assessment based on their threatened status, habitat on site, likelihood of occurrence and potential impacts from the proposal. These species required further detailed assessment to determine breeding, foraging and movement in this locality to determine if there are impacts from the proposal that are likely to be considered significant.

1. Gang-gang Cockatoo (*Callocephalon fimbriatum*) – EPBC listed as Endangered

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

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

In NSW, Gang-gang Cockatoos usually inhabit eucalyptus woodlands of the east coast and northern highlands of Australia. In summer they prefer to live at high altitudes in moist forests and in winter they prefer the open woodlands of lower altitudes. This implies that Gang-gangs are more likely to breed in areas of high altitudes as their known breeding season in during spring and summer (NSW Scientific Committee, 2008).

The proposed project is located in Thredbo Village in Kosciuszko National Park as part of the South-eastern Highlands IBRA region within the Monaro sub-region. The proposal site is on the outer skirts of the residential area between the Alpine Way road and the township. The site is well connected to surrounding vegetation and is proposing to clear 0.67 ha of woodland vegetation and 0.33 ha of grassy vegetation that forms part of a much larger patch of native vegetation exceeding 1000ha.

The calculations show that native vegetation covers 95% of 1500m surrounding the site and the project is expected to impact on 0.14% of native vegetation mapped within this area.

Gang-gang Cockatoo's were not detected on site during surveys. Gang-gang Cockatoo habitat, totalling a maximum of 1ha, is expected to be impacted by the proposal. Gang-gangs breed in hollows greater than 10cm in diameter (OEH, 2008). Three hollows of suitable size for breeding were detected in Eucalyptus species, however there was no Gang-gang activity recorded. It is acknowledged possible that this species could use the site as foraging habitat.

The scope of the proposal does not expect the project will lead to a long-term decrease in the size of the population as there were no signs of breeding on site and the proposal is connected to large areas of similar vegetation that surrounds the site.

ii.	**Reduce the area of occupancy of the species**

A maximum total of 1 ha of Gang-gang Cockatoo habitat is expected to be impacted by the proposal.

The scope of the proposal does not expect to significantly reduce the area of occupancy of the species as the site is surrounded by National Park that is well managed that spans across 690,000 ha. The calculations show that native vegetation covers 95% of 1500m surrounding the site and the project is expected to impact on 0.14% of native vegetation mapped within this area.

iii.	**Fragment an existing population into two or more populations**

The proposal site does not contain vegetation links that are essential for preserving connectivity of native habitat across the landscape. The canopy of the vegetation to be cleared within the proposal site is well connected to surrounding native vegetation (Kosciuszko National Park) according to desktop analysis of aerial imagery and publicly available vegetation data.

As discussed above, the native vegetation within the proposal makes up only 0.14% of the total native vegetation within 1500km of the site, covering a total of 1 ha. This forms part of a much larger patch of native vegetation exceeding 1000ha. Therefore, it is not expected that the proposal will fragment an existing population into two or more populations.

iv.	**Adversely affect habitat critical to the survival of a species**

The proposed project will be restricted to the approved development footprint of which does not exceed a total of 1 ha including 0.67ha of woody native vegetation and 0.33 ha of grassy native vegetation. Due to the small impact area of potential Gang-gang Cockatoo habitat, the proposal does not expect to adversely affect habitat critical to the survival of a species as vegetation proposed for clearing forms part of a much larger patch of native vegetation exceeding 1000ha.

v.	**Disrupt the breeding cycle of a population**

Detailed habitat surveys of the proposed development impact area show that three hollows of suitable size for breeding were detected in a Eucalyptus species, however, there was no Gang-gang activity recorded. The species are known to breed during spring and summer. Any clearing of land for the proposal will occur outside of breeding season to avoid disrupting any breed cycles that have potential to occur within the proposed site boundary.

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

The proposed project will be restricted to the approved development footprint of which does not exceed a total of 1 ha including 0.67ha of woody native vegetation and 0.33 ha of grassy native vegetation.

Due to the small impact area of potential Gang-gang Cockatoo habitat, the proposal does not expect to affect habitat to the extent that the species is likely to decline as vegetation proposed for clearing forms part of a much larger patch of native vegetation exceeding 1000ha including Kosciuszko National Park.

vii. Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat

Invasive species such as the Red Fox (*Vulpes vulpes*), Feral Cat (*Felis catus*) and Wild Dog (*Canis lupus ssp.*) have potential to reside in the area already. Tree climbing pest species (Feral Cats) have a higher chance to inflict harm on tree dwelling species.

The proposed development will be for tourist accommodation and domestic pets are banned inside National Parks. No other invasive species are considered to be a significant threat to this species. It is considered unlikely that the proposal will result in an increase in invasive species that are harmful to Gang-gang's becoming established in its habitat.

Mitigation measures have been recommended to be implemented during the construction phase of the project including:

- Staff will be trained and briefed environmental features to be protected and measures to be implemented through site inductions and toolbox talks.
- Appropriate landscape plantings of local indigenous species to replace loss of vegetation.
- A Weed Management procedure would be developed to prevent and minimise the spread of weeds for declared priority weeds under the Biosecurity Act 2015 during and after construction;
- Weed hygiene protocol in relation to plant, machinery, and fill;
- Wash down site vehicles prior to entering the site;
- Any occurrences of pathogens such as Chytrid Fungus and Phytophthora would be monitored, treated, and reported
- Installation of sediment controls to prevent sediment runoff into creek
- A sediment control plan would be prepared in conjunction with the final design and implemented; and
- Spill management procedures would be implemented.
- Approved clearing limits to be clearly delineated with temporary fencing or similar prior to construction commencing.
- In areas to clear adjacent to areas to be retained, chainsaws would be used rather than heavy machinery to minimise risk of unauthorised disturbance.
- Prior to construction commencing, exclusion fencing, and signage would be installed around boundary to protect vegetation on adjoining properties

viii. Introduce disease that may cause the species to decline

Mitigation measures have been recommended to be implemented during the construction phase of the project to prevent the introduction of invasive species as per answer above.

ix. Interfere with the recovery of the species

As a result of mitigation measures that have been proposed to be in place prior to the clearing any vegetation, it is not expected that the proposed project will have an interference on the recovering of the species. Mitigation measured put in place include:

- Tree clearing procedure involving:
    - Pre-clearing surveys by an ecologist or wildlife handler.
    - a fauna spotter/ecologist present during removal of hollow bearing trees
    - timed clearing to avoid breeding periods for hollow dependent fauna such as Gang-gang Cockatoo, from September to February.
- Approved clearing limits to be clearly delineated with temporary fencing or similar prior to construction commencing.
- In areas to clear adjacent to areas to be retained, chainsaws would be used rather than heavy machinery to minimise risk of unauthorised disturbance.

References:

NSW Scientific Committee (2008). Gang-gang Cockatoo *Callocephalon fimbriatum*. Review of Current Information in NSW. Established under the Threatened Species Conservation Act 1995. December 2008.

2. Spotted-tailed Quoll (*Dasyurus maculatus*) – EPBC listed as Endangered

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

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

The Spotted-tailed Quoll (STQ) is a carnivorous mammal, feeding on a wide variety of small-medium prey (Glen & Dickman, 2006). The home range for the species extends from a couple hundred hectares up to two thousand hectares. The Spotted-tailed Quoll requires large areas of contiguous bushland, the main threats are habitat loss, fragmentation, timber harvesting, eating 1080 fox baits, competition and predation from introduced predators such dogs, cats and foxes, humans killing quolls, climate change, vehicle strike, and bushfires (DELWP 2016).

The development is located in Thredbo Village in Kosciuszko National Park as part of the South-eastern Highlands IBRA region within the Monaro sub-region. The proposal site is positioned on the outer skirts of the residential area between the Alpine Way road and the township.

The site contains suitable habitat in the woodland areas (0.67 ha) that flank the north-eastern and south-western sections of the site, and in grassy areas (0.33 ha) that transverse the site, totalling to 1ha. The calculations show that native vegetation covers 95% of 1500m surrounding the site and the project is expected to impact on 0.14% of native vegetation mapped within this area.

There is no suitable breeding habitat including rocky outcrops and hollow logs from the surveys undertaken.

The scale of impact of the proposal does not expect that the project will lead to a long-term decrease in the size of the population as vegetation proposed for clearing forms part of a much larger patch of native vegetation exceeding 1000ha. The habitat surrounding is high quality habitat and is National Park meaning it will be protected in perpetuity.

ii. Reduce the area of occupancy of the species

A maximum total of 1 ha of Spotted-tailed Quoll foraging habitat is expected to be impacted by the proposal. No breeding habitat is present inside the subject land.

The scope of the proposal does not expect to significantly reduce the area of occupancy of the species as will remove no potential breeding habitat for this species and the site is surrounded by National Park that is well managed that spans across 690,000 ha. The calculations show that native vegetation covers 95% of 1500m surrounding the site and the project is expected to impact on 0.14% of native vegetation mapped within this area.

iii. Fragment an existing population into two or more populations

The proposal site does not contain vegetation links that are essential for preserving connectivity of native habitat across the landscape. The canopy of the vegetation to be cleared within the proposal site is well connected to surrounding native vegetation (Kosciuszko National Park) according to desktop analysis of aerial imagery and publicly available vegetation data.

As discussed above, the native vegetation within the proposal makes up only 0.14% of the total native vegetation within 1500km of the site, covering a total of 1 ha. This forms part of a much

larger patch of native vegetation exceeding 1000ha. Therefore, it is not expected that the proposal will fragment an existing population into two or more populations.

iv. Adversely affect habitat critical to the survival of a species

Habitat critical to the survival of Spotted-tailed Quoll is not well known, however, the habitat present within the surrounding vegetation and within Kosciuszko National Park is likely to be important if suitable den sites and rocky outcrops are present.

The proposed project will be restricted to the approved development footprint of which does not exceed a total of 1 ha including 0.67ha of woody native vegetation and 0.33 ha of grassy native vegetation. It forms part of a much larger patch of native vegetation exceeding 1000ha where there is more likely to be a higher abundance of rocky areas, fallen logs, and hollow bearing trees which may provide potential den sites.

Due to the small impact area of potential Spotted-tailed Quoll habitat and lack of suitable habitat features, the proposal does not expect to adversely affect habitat critical to the survival of a species.

v. Disrupt the breeding cycle of a population

Research by Belcher and Darrant (2006) show that STQ require suitable den sites for breeding. Where available, complex rocky outcrops and large hollow logs are preferentially used as denning sites for STQ (Belcher & Darrant, 2006; Glen & Dickman, 2006). Where absent, STQ has been recorded using hollow-bearing trees for denning. STQ are known to occupy very large home ranges (up to several thousand hectares) and use multiple dens sites (up to 20) (Long & Nelson, 2010).

The study area contains some potential breeding habitat in the form of five hollow bearing trees recorded on site (one small and one medium trunk hollow, and two small, one medium, and one large limb hollow). Any clearing of land for the proposal will occur outside of breeding season to allow any animals potential to breed in the site to move to another breeding site. This will avoid disrupting any breed cycles that have potential to occur within the proposed site boundary.

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

The proposed project will be restricted to the approved development footprint of which does not exceed a total of 1 ha including 0.67ha of woody native vegetation and 0.33 ha of grassy native vegetation and forms part of a much larger patch of native vegetation exceeding 1000ha.

Due to the small impact area of potential Spotted-tail Quoll habitat and the connectivity to surrounding vegetation, the proposal does not expect to affect habitat to the extent that the species is likely to decline

vii. Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat

Dietary overlap between STQ and invasive species such as the Red Fox (Vulpes vulpes), Feral Cat (Felis catus) and Wild Dog (Canis lupus ssp.) presents strong competition for resources with

small-medium mammals being an important prey item for all of them. Glen & Dickman (2006) found the most important prey for all these predators were small to medium-sized mammals.

It is likely that at least one of these invasive species already occur within the subject site

, having been previously recorded in locality. No other invasive species are considered to be a significant threat to this species.

It is considered unlikely that the proposal will result in an increase in invasive species that are harmful to STQ becoming established in its habitat. Mitigation measures have been proposed which would further reduce the potential establishment of exotic species.

Mitigation measures have been recommended to be implemented during the construction phase of the project including:

- Staff will be trained and briefed environmental features to be protected and measures to be implemented through site inductions and toolbox talks.
- Appropriate landscape plantings of local indigenous species to replace loss of vegetation.
- A Weed Management procedure would be developed to prevent and minimise the spread of weeds for declared priority weeds under the Biosecurity Act 2015 during and after construction;
- Weed hygiene protocol in relation to plant, machinery, and fill;
- Wash down site vehicles prior to entering the site;
- Any occurrences of pathogens such as Chytrid Fungus and Phytophthora would be monitored, treated, and reported
- Installation of sediment controls to prevent sediment runoff into creek
- A sediment control plan would be prepared in conjunction with the final design and implemented; and
- Spill management procedures would be implemented.
- Approved clearing limits to be clearly delineated with temporary fencing or similar prior to construction commencing.
- In areas to clear adjacent to areas to be retained, chainsaws would be used rather than heavy machinery to minimise risk of unauthorised disturbance.
- Prior to construction commencing, exclusion fencing, and signage would be installed around boundary to protect vegetation on adjoining properties

viii. Introduce disease that may cause the species to decline, or

Ectoparasites have been recorded on STQ within NSW, however these are not considered to pose a risk to the persistence of STQ. No other diseases are known to significantly impact this species. With the implementation of appropriate hygiene measures, it is considered unlikely that diseases will be introduced as a result of the proposal.

Mitigation measures have been recommended to be implemented during the construction phase of the project as per answer above.

ix. Interfere with the recovery of the species

The location of the proposal site is located within the Kosciuszko National Park however it is a part of the Thredbo Village township and is contributing to the community. This area is not deemed as part of a recovery plan for Spotted-tailed Quolls.

References:

Belcher, C., & Darrant, J. (2006). Habitat use by tiger quoll (Dasyurus maculatus) (Marsupialia: Dasyuridae) in south-eastern Australia. Journal of Zoology, 183-190.

Department of Environment, Land, Water and Planning (DELWP) (2016). National Recovery Plan for the Spotted-tailed Quoll Dasyurus maculatus. Australian Government, Canberra.

Glen, A., & Dickman, C. (2006). Diet of the spotted-tailed quoll (Dasyurus maculatus) in eastern Australia: effects of season, sex and size. Journal of Zoology, 241-248.

Long, K., & Nelson, J. (2007). National Recovery Plan for the Spotted-tailed Quoll Dasyurus maculatus. Melbourne: Department of Sustainability and Environment.

3. Koala *(Phascolarctos cinereus)* – EPBC listed as Endangered

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

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

Studies show that Koala feed tree species are broader over larger home ranges in locations such as the southern highlands because low nutrient levels (e.g., Stalenberg et al. 2014, Youngentob 2014). This is compared to other locations where Koalas will have a narrower range of feed trees classified by importance. They are classified into primary and secondary trees based on the patterns of tree use and species preference of Koala in a particular location (Phillips 2000; DECC 2008).

The subject land is located in Thredbo Village in Kosciuszko National Park as part of the South-eastern Highlands IBRA region within the Monaro sub-region. The site is positioned on the outer skirts of the residential area between the Alpine Way road and the township.

Koalas were not detected on site during surveys. However, a total of 0.67 ha of Koala habitat (area containing identified Koala feed tree species) is expected to be impacted by the proposal.

The calculations show that native vegetation covers 95% of 1500m surrounding the site and the project is expected to impact on 0.09% of native vegetation mapped within this area.

The scope of the proposal does not expect that the project will lead to a long-term decrease in the size of the population as there were no signs of Koala activity on the site, the site is surrounded by Kosciusko National Park of similar vegetation, and the size of the impact area is small.

ii. Reduce the area of occupancy of the species

A maximum total of 0.67 ha of Koala habitat is expected to be impacted by the proposal.

The scope of the proposal does not expect to significantly reduce the area of occupancy of the species due to the small area proposed to be cleared and the site is surrounded by National

Park that is well managed that spans across 690,000 ha. The calculations show that native vegetation covers 95% of 1500m surrounding the site and the project is expected to impact on 0.09% of native vegetation mapped within this area.

iii. Fragment an existing population into two or more populations

The proposal site does not contain vegetation links that are essential for preserving connectivity of native habitat across the landscape. The vegetation to be cleared within the proposal site is well connected to surrounding native vegetation (Kosciuszko National Park), according to desktop analysis of aerial imagery and publicly available vegetation data.

As discussed above, the native vegetation within the proposal makes up only 0.09% of the total native vegetation within 1500km of the site, covering a total of 0.67 ha. This forms part of a much larger patch of native vegetation exceeding 1000ha. Therefore, it is not expected that the proposal will fragment an existing population into two or more populations.

The vegetation proposed for clearing forms part of a much larger patch of native vegetation exceeding 1000ha. Therefore, it is not expected that the proposal will fragment an existing population into two or more populations.

iv. Adversely affect habitat critical to the survival of a species

Koala was classified as 'endangered' back in February 2022 so has increased in its conservation status. The EPBC Act Referral Guidelines for the Koala (DoE 2014) documents the 'Koala habitat assessment tool' below which can be used to assess impact on habitat critical to the survival of the Koala. This tool was utilised as it applies to the proposal. Impact areas that score five or more using this tool contain habitat critical to the survival of the Koala.

The assessment resulted in a score of 7 and, as such, habitat within the subject land may be critical to the survival of the Koala and therefore an 'assessment of significant impact' required under EPBC Act. However, the proposed project will be restricted to the approved development footprint of which does not exceed a total of 0.67ha of woody native vegetation.

Due to the small impact area of potential Koala habitat, the proposal does not expect to adversely affect habitat critical to the survival of a species as vegetation proposed for clearing forms part of a much larger patch of native vegetation exceeding 1000ha.

v. Disrupt the breeding cycle of a population

The construction of the proposed project will not be undertaken during known breeding periods. Pre-clearance surveys will be undertaken before any clearing commences to ensure Koalas won't be directly impacted.

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

The proposed project will be restricted to the approved development footprint of which does not exceed a total of 0.67ha of woody native vegetation (Koala habitat) and 0.33 ha of grassy native vegetation. Due to the small impact area of potential Koala habitat, the proposal does not expect to affect habitat to the extent that the species is likely to decline as vegetation proposed for clearing forms part of a much larger patch of native vegetation exceeding 1000ha.

vii. Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat

Invasive species such as the Red Fox (*Vulpes vulpes*), Feral Cat (*Felis catus*) and Wild Dog (*Canis lupus ssp.*) have potential to reside in the area. Tree climbing pest species (Feral Cats) have a higher chance to inflict harm on tree dwelling species but other pests such as Foxes and dogs can present a threat when Koalas reach the ground. There are limited to no evidence of Koala mortality from a dog and dogs are prohibited from inside the national park where the project site is located.

No other invasive species are considered to be a significant threat to this species. It is considered unlikely that the proposal will result in an increase in invasive species that are harmful to Koalas becoming established in its habitat.

Mitigation measures have been recommended to be implemented during the construction phase of the project including:

- Staff will be trained and briefed environmental features to be protected and measures to be implemented through site inductions and toolbox talks.
- Appropriate landscape plantings of local indigenous species to replace loss of vegetation.
- A Weed Management procedure would be developed to prevent and minimise the spread of weeds for declared priority weeds under the Biosecurity Act 2015 during and after construction;
- Weed hygiene protocol in relation to plant, machinery, and fill;
- Wash down site vehicles prior to entering the site;
- Any occurrences of pathogens such as Chytrid Fungus and Phytophthora would be monitored, treated, and reported
- Installation of sediment controls to prevent sediment runoff into creek
- A sediment control plan would be prepared in conjunction with the final design and implemented; and
- Spill management procedures would be implemented.
- Approved clearing limits to be clearly delineated with temporary fencing or similar prior to construction commencing.
- In areas to clear adjacent to areas to be retained, chainsaws would be used rather than heavy machinery to minimise risk of unauthorised disturbance.
- Prior to construction commencing, exclusion fencing, and signage would be installed around boundary to protect vegetation on adjoining properties

viii. Introduce disease that may cause the species to decline, or

The main types of diseases that are a concern for Koala are chlamydia and Koala retrovirus. These diseases are spread from one Koala to another and are not zoonotic or spread by other animals or plants. It is unlikely that the proposed project will introduce or increase the spread of these diseases.

Mitigation measures have been recommended to be implemented during the construction phase of the project as per answer above.

ix. Interfere with the recovery of the species

The location of the proposal site is located within the Kosciuszko National Park; however, it is a part of the Thredbo Village township and will provide tourist accommodation. This area is not deemed as part of a recovery plan for Koalas.

References

DECC 2008, Recovery Plan for the koala (Phascolarctos cinereus), Department of Environment and Climate Change NSW, Sydney.

Department of the Environment (2014) EPBC Act Referral Guidelines for the vulnerable koala (combined populations of Queensland, New South Wales, and the Australian Capital Territory), Commonwealth Department of Environment, 2014

Phillips S 2000, Tree species preferences of the Koala Phascolarctos cinereus as a basis for the delineation of management areas for recovery planning in New South Wales, report to the NSW National Parks and Wildlife Service.

Stalenberg E, Wallis IR, Cunningham RB, Allen C and Foley WJ 2014, Nutritional Correlates of Koala Persistence in a Low-Density Population, PLoS ONE 9, no.12, e113930, doi:10.1371/journal.pone.0113930.

Youngentob KN 2014, Emerging Priorities Final Report: Charting Forage Quality for Koala Conservation, Canberra ACT.

4. Broad-toothed Rat *(Mastacomys fuscus mordicus)* – EPBC listed as Vulnerable

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

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

The Broad-toothed Rat species has a fragmented distribution with small populations spread across the east coast of Australian between NSW and Victoria. There is a well-studied small sub-population residing in Kosciusko National Park. Sources consider this subpopulation to be scarce and patchily distributed (Happold, 2008; Menkhorst et al. 2008; Woinarski et al. 2014). According to the Committee, there is insufficient information to determine the size of the population of the subspecies (TSSC, 2016). The main cause for their species decline is predation by foxes and cats, fire, and competition with other rodents (Menkhorst et al. 2008).

The Broad-toothed Rat inhabits areas of dense and grassy ground cover within cool wet climates nearby a water source (Vic SAC 2012). The species predominantly feeds on grasses (Carron et al., 1990). During breeding (October-March) season they nest in burrows and in winter they reside in communal dens of grass, in dense understories, or under snow (Bubela & Happold 1993; Happold 1998).

The proposal site is located in Kosciuszko National Park on the outer skirts of Thredbo Village between the Alpine Way road and the township. The site is well connected to surrounding vegetation and is proposing to clear 0.67 ha of woodland vegetation. Results of surveys show that this clearance area contains some dense and grassy vegetation that has the potential to provide nesting, refuge and foraging habitat.

However, the population that is recorded to be inhabiting the national park is predicted to be a small subpopulation. It is unlikely that a population would be utilising the part of the environment that's closest to the township where edge effects is likely to have an influence.

Due to the small area proposed to be cleared and the location of the proposal, it is not expected that the proposed action will lead to a long-term decrease in the size of an important population of a species.

ii. Reduce the area of occupancy of an important population

A maximum total of 0.67 ha of Broad-toothed Rat habitat is expected to be impacted by the proposal.

The scope of the proposal does not expect to significantly reduce the area of occupancy of the species due to the small area proposed to be cleared and the site is surrounded by National Park that is well managed that spans across 690,000 ha. The calculations show that native vegetation covers 95% of 1500m surrounding the site and the project is expected to impact on 0.09% of native vegetation mapped within this area. It is unlikely that a population would be utilising the environment that's closest to the township where edge effects is likely to have an influence.

iii. Fragment an existing important population into two or more populations

The Broad-toothed Rat has a highly fragmented distribution across NSW and Victoria (TSSC, 2016). The proposal site is located on the outskirts of the Thredbo Village township and is well connected to native vegetation (Kosciuszko National Park), according to desktop analysis of aerial imagery and publicly available vegetation data.

As discussed above, the native vegetation within the proposal makes up only 0.09% of the total native vegetation within 1500km of the site, covering a total of 0.67 ha. This forms part of a much larger patch of native vegetation exceeding 1000ha. Therefore, it is not expected that the proposal will fragment an existing important population into two or more populations.

iv. Adversely affect habitat critical to the survival of a species

The population that is recorded to be inhabiting area of the national park is predicted to be a small subpopulation. It is unlikely that a population would be utilising the environment that's closest to the township where edge effects is likely to have an influence.

Due to the small area proposed to be cleared (0.67 ha) and the location of the proposal, it is not expected that the proposed action will adversely affect habitat critical to the survival of a species.

v. Disrupt the breeding cycle of an important population

The construction of the proposed project will not be undertaken during known breeding periods (outside of October-March). Pre-clearance surveys will be undertaken before any clearing commences to ensure Broad-toothed Rats won't be directly impacted.

With mitigation measures being put in place, the proposed activities will not disrupt the breeding cycle of an important population.

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

The proposed project will be restricted to the approved development footprint of which does not exceed a maximum total of 0.67ha woody native vegetation.

Due to the small impact area of potential Broad-toothed Rat habitat, the proposal does not expect to affect habitat to the extent that the species is likely to decline as vegetation proposed for clearing forms part of a much larger patch of native vegetation exceeding 1000ha.

vii. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The main cause for their species decline is predation by foxes and cats, fire, and competition with other rodents (Menkhorst et al. 2008). Invasive species such as the Red Fox (*Vulpes vulpes*), Feral Cat (*Felis catus*), Wild Dog (*Canis lupus ssp.*), and exotic rodent species have potential to already reside in the area.

Furthermore, dogs are prohibited from inside the national park where the project site is located and no domestic pets will be associated with the new development

No other invasive species are considered to be a significant threat to this species. It is considered unlikely that the proposal will result in an increase in invasive species that are harmful to Broad-toothed Rats becoming established in its habitat.

Mitigation measures have been recommended to be implemented during the construction phase of the project including:

- Staff will be trained and briefed environmental features to be protected and measures to be implemented through site inductions and toolbox talks.
- Appropriate landscape plantings of local indigenous species to replace loss of vegetation.
- A Weed Management procedure would be developed to prevent and minimise the spread of weeds for declared priority weeds under the Biosecurity Act 2015 during and after construction;
- Weed hygiene protocol in relation to plant, machinery, and fill;
- Wash down site vehicles prior to entering the site;
- Any occurrences of pathogens such as Chytrid Fungus and Phytophthora would be monitored, treated, and reported
- Installation of sediment controls to prevent sediment runoff into creek
- A sediment control plan would be prepared in conjunction with the final design and implemented; and

- Spill management procedures would be implemented.
- Approved clearing limits to be clearly delineated with temporary fencing or similar prior to construction commencing.
- In areas to clear adjacent to areas to be retained, chainsaws would be used rather than heavy machinery to minimise risk of unauthorised disturbance.

Prior to construction commencing, exclusion fencing, and signage would be installed around boundary to protect vegetation on adjoining properties

viii. Introduce disease that may cause the species to decline

There are no known diseases that cause a threat to populations of Broad-toothed Rats.

ix. Interfere substantially with the recovery of the species

Currently, there are no species-specific management actions in place for the Broad-toothed Rat in the mainland and the proposal will be contained within the site boundary totalling an area of 1ha on the outskirts of Thredbo Village.

Mitigation measures have been proposed to prevent direct impacts to the species. These include:

- Tree clearing procedure involving:
    - Pre-clearing surveys by an ecologist or wildlife handler.
    - a fauna spotter/ecologist present during removal of hollow bearing trees
    - timed clearing to avoid breeding periods for hollow dependent fauna such as Gang-gang Cockatoo, from September to February.
- Approved clearing limits to be clearly delineated with temporary fencing or similar prior to construction commencing.
- In areas to clear adjacent to areas to be retained, chainsaws would be used rather than heavy machinery to minimise risk of unauthorised disturbance.

As a result of mitigation measures that have been proposed to be in place prior to the clearing any vegetation, it is not expected that the proposed project will have an interference on the recovery of the species.

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