



Statement of Environmental Effects

Playground Mountain Bike Trail *Application for use of trail*

Thredbo Alpine Resort, 2 Friday Drive, Thredbo NSW 2625

June 2025

Document Control

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1 Introduction

This Statement of Environmental Effects (SEE) has been prepared to support the Development Application (DA) for the use of the Playground Mountain Bike Trail (hereinafter referred to as the Development). The Applicant for the DA is Kosciuszko Thredbo Pty Ltd (KT) (ABN 95 000 139 015).

The Development site is located within the Cruiser ski area adjacent to/below the Cruiser chairlift within the Playground ski run. Easy Rider, Paparazzi and Grasshopper MTB trails are located within close proximity of the site. The site is within the Thredbo Head Lease Area on land formally described as Lot 876 DP1243112.

1.1 Previous approvals applicable to the site

The trail was approved under DA 24/966 on 14 March 2024 and constructed in summer 2024/25. A map showing the approved alignment is depicted in **Appendix A**.

2 Purpose of application

On 5 February 2025 KT notified the Department of Planning, Housing and Infrastructure (the Department) that part of the trail approved under DA 24/966 had been constructed outside of the approved alignment. A map showing the approved alignment vs the as built alignment is provided in **Appendix A**.

The Department (Mark Brown, Team Leader Alpine Resorts Team) advised in writing on 10 June 2025:

“...the Department would consider that a retrospective modification to the Playground MTB could not occur and seeks the submission of a use DA to enable use of the trail. The Department has forwarded the information provided to date to NPWS for comment and I will follow this up today”.

Hence, this application is being lodged to allow the use of the trail as per the Works as Executed plan in **Appendix B**.

3 Legislation and Statutory Framework

A review of the proposal against the following legislation was undertaken in the original DA 24/966. The assessment remains unchanged.

- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environmental Planning and Assessment Act 1979*
- *Biodiversity Conservation Act 2016*
- *State Environmental Planning Policy (Precincts – Regional) 2021*

The Development is consistent with the aims and objectives of the relevant legislation and will not result in any significant adverse impacts. The Development is unlikely to have a significant impact on any MNES or Commonwealth land, and a referral to the Commonwealth Environment Minister is therefore not recommended.

3.1 NSW Alpine Region Development Control Plan 2025

Since lodgement of the original DA, the NSW Alpine Region Development Control Plan 2025 (Alpine DCP) has come into effect. The Alpine DCP provides detailed provisions for development in the NSW Alpine Resort areas. It aims to guide development, enable diverse recreational activities, minimise environmental and social impacts, and protect biophysical values.

Chapter 2.4 of the Alpine DCP describes the relevant development controls applicable to on-mountain infrastructure. A review of the Development against Chapter 2.4 is provided in **Table 1**.

Table 1: Alpine DCP, Chapter 2.4 On-mountain development and infrastructure provisions

Objectives and Controls	Comments
The objectives and controls in this part apply to development for the purposes of lifting facilities, monitoring stations, ski-slope huts, snow-making infrastructure, infrastructure facilities and recreation infrastructure.	The Development is for the purposes of recreation infrastructure.
Objectives O1. Allow for a mix of summer and winter recreational opportunities for a range of visitor skill levels and types that enhances the particular Alpine Sub-region character. O2. Allow for on-mountain development and infrastructure that is environmentally sustainable and meets visitor needs. O3. Ensure ease and efficiency of circulation, adequacy of public facilities, lift and trail capacity and public safety to enhance amenity in all seasons.	Complies: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA The Development is consistent with the objectives of Chapter 2.4 as it will contribute to improved trail network, therefore enhanced guest experience.
Controls C1. Upgrades to lifting infrastructure and snowmaking infrastructure prioritise development that limits disturbance to existing alignments. Where this is not practical or will result in adverse impact on amenity or efficiency, development may occur outside of existing alignments.	Complies: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA The Development is for a mountain bike trail.
C2. Aerial lifts are to be used in place of surface lifts, unless it can be demonstrated that a surface lift is necessary for operational reasons and that the surface lift will result in minimal environmental impacts. Consideration will be given to environmental impacts and operational outcomes in consideration of the most appropriate form of lifting infrastructure and any associated cabling.	Complies: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA The Development is for a mountain bike trail.
C3. Walking trails and infrastructure are designed along existing disturbed areas such as ski slopes. Where this is not practical, development may occur outside of existing disturbed areas.	Complies: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA The Development has utilised a mix of disturbed areas and native vegetation.
C4. All summer and winter on-mountain developments and infrastructure make efficient use of the natural terrain by limiting terrain modification to where it is essential for safety, to resolve environmental issues or to improve visitor experience.	Complies: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA The Development has been designed to utilise the natural terrain to create the appropriate gradients for an intermediate trail.

4 Impact Assessment

The assessment of impacts to land, water, heritage, Aboriginal cultural heritage, landscape character and visual amenity, access, air, noise, socio-economic and MNES in the original DA 24/966 remains unchanged.

An assessment of the additional impacts to biodiversity have been assessed by Eco Logical Australia (2025). A copy of the assessment is provided in **Appendix C**.

5 Conclusion

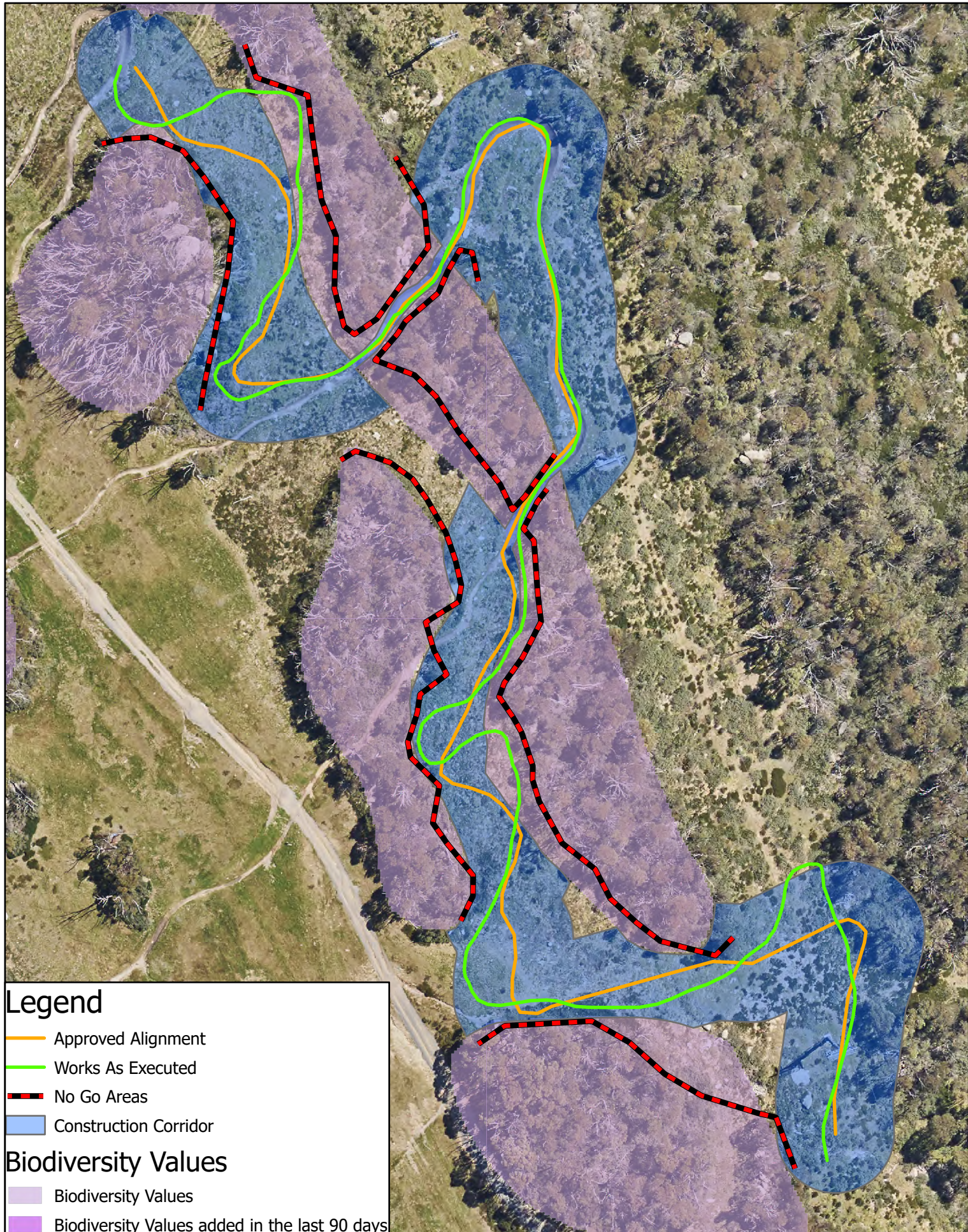
This application is seeking development approval for use of the Playground mountain bike trail that was constructed in summer 2024/2025 under DA 24/966. This application has been prepared in response to the advice from DPHI to legitimise the use of trail sections that did not align with the approval alignment. The ongoing use of the trail is considered to be of positive impact for Thredbo Alpine Resort and the broader Snowy Mountains region. The trail will be managed in accordance with the overarching Thredbo Mountain Bike Trail Management Plan as per the original development consent.

6 References

Eco Logical Australia 2025, Playground MTB Trail – Impacts on Biodiversity Values mapped areas and other non-compliances.

7 Appendices

Appendix A – Approved Trail Alignment VS Works as Executed



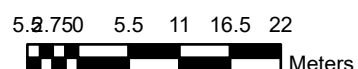
Legend

- Approved Alignment
- Works As Executed
- No Go Areas
- Construction Corridor

Biodiversity Values

- Biodiversity Values
- Biodiversity Values added in the last 90 days

Scale: 1:820



Map Projection: Universal
Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



Approved Alignment vs Works As Executed

Project: DA 24/966
Playground MTB Trail

Revision: A
Date: 03/02/2025
Produced By: BB

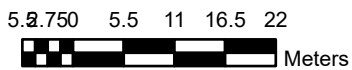
Appendix B – Works as Executed



Legend

— Works As Executed

Scale: 1:820



Map Projection: Universal
Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



Works As Executed

Project: DA 24/966
Playground MTB Trail

Revision: A

Date: 03/02/2025

Produced By: BB

Appendix C – Flora and Fauna Assessment



Flora and Fauna Assessment - Playground MTB Trail Thredbo Alpine Resort

Kosciuszko Thredbo Pty Ltd

DOCUMENT TRACKING

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This document has been prepared by Eco Logical Australia Pty Ltd with support from Kosciuszko Thredbo Pty Ltd

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Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method
BC Act	<i>NSW Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
CEEC	Critically Endangered Ecological Community
DoCCEEW	Department of Climate Change, Energy, the Environment and Water
DPE	NSW Department of Planning and Environment
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	<i>NSW Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
FM Act	<i>NSW Fisheries Management Act 1994</i>
FFA	Flora and Fauna Assessment
GIS	Geographic Information System
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
KT	Kosciuszko Thredbo Pty Ltd
LGA	Local Government Area
NSW	New South Wales
NOW	NSW Office of Water
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSI	State Significant Infrastructure
TEC	Threatened Ecological Community
VIS	Vegetation Information System
WM Act	<i>NSW Water Management Act 2000</i>

Executive Summary

This report describes the biological environment and assesses the potential effects on threatened and migratory species, endangered populations and ecological communities of a proposal to construct the Playground mountain bike trail at Thredbo Alpine Resort.

The proposed trail will be an intermediate (blue) trail that incorporates a combination of flow, freeride and park styles of trail design. The trail will have higher speed rhythm/technical sections and banked turns but will mainly be focused on jumps to promote skill development and progression. The new trail will contribute to diversifying Thredbo's trail network and creating a better riding experience for guests.

The trail alignment was modified to avoid constrained areas such as higher conservation significance vegetation communities and land mapped on the Biodiversity Values Map, as defined in the NSW *Biodiversity Conservation Regulation 2017* (BC Reg). The trail will utilise the existing Lower All-mountain trail alignment in the Biodiversity Values Mapped areas, therefore no vegetation clearing is required in these locations. As such, the proposal will not trigger the Biodiversity Offsets Scheme (BOS), as it will not affect any land identified on the Biodiversity Values map and the total clearing of native vegetation associated with the proposal will not exceed the 1 ha threshold which applies to the Thredbo Resort Area. =

The construction of the trail will require the clearing of shrubs and groundcovers in a 2-3 m wide corridor where the trail traverses native vegetation. The disturbance corridor is required to contain the upper and lower batters and the trail surface when the trail is traversing across moderate slopes. On gentler slopes the disturbance corridor will be closer to 1.5 m. The average disturbance width is expected to be 2.5 m. The clearing will be undertaken with a mix of hand tools i.e. chainsaws and brush-cutters, and machinery i.e. mini-excavator.

The study area and immediate surrounds was found to support one native vegetation community: Subalpine Woodland, in two condition states Good and Derived Shrubland. No threatened flora species were recorded within the study area during the survey period. The study area does not support any endangered ecological communities. Only approximately 925 m² of Subalpine Woodland is expected to be removed in association with the proposal. Whilst this comprises an adverse impact, it is considered acceptable given the very small proportion of the extent of the community within the Thredbo Resort Area (less than 0.02%), and within the locality, that will be affected.

Whilst the study area provides a small amount of potential habitat for threatened fauna species such as the Broad-toothed Rat, Gang-gang Cockatoo, Olive Whistler, Eastern Pygmy-possum and Flame Robin, similar habitats are extensive in the locality and the habitats to be affected are small in the context of the extent of similar habitats contiguous with the study area. Furthermore, the proposal will not affect any potentially important habitats for threatened fauna species. The proposal will not sever any linkages between habitats or otherwise permanently restrict fauna movement.

An assessment of the effects of the proposal on threatened species, populations and ecological communities which may be directly or indirectly affected by the proposal was undertaken by applying the five factors from Section 7.3 of the *Biodiversity Conservation Act 2016*. This assessment concluded that the proposal is unlikely to have a significant effect on threatened species, populations or ecological communities or their habitats.

Following consideration of the administrative guidelines for determining significance under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999*, it is concluded that the proposal is unlikely to have a significant impact on matters of National Environmental Significance or Commonwealth land, and a referral to the Commonwealth Environment Minister is not recommended.

Notwithstanding the relatively minor impacts associated with the proposal, a number of impact mitigation and amelioration measures have been recommended to be incorporated into the proposal, as identified in Section 5.

1. Introduction

Eco Logical Australia Pty Ltd (ELA) was engaged by Kosciuszko Thredbo Pty Ltd to prepare a flora and fauna assessment (FFA) to accompany a proposal to construct a mountain bike trail, at Thredbo Alpine Resort. This FFA provides the findings of a review of relevant literature, database searches and field survey. It also addresses relevant statutory considerations and makes recommendations to ameliorate the potential impacts of the proposal on vegetation and habitats.

The aim of this investigation was to assess the ecological impacts of the proposal on flora, fauna and habitats within the study area. The objectives of this investigation were:

- To identify and describe the flora species and vegetation communities present in the study area, their condition and conservation significance
- To identify and describe the fauna habitats present in the study area and their condition
- To identify the fauna species which are present or likely to occur in the study area, and describe their conservation significance
- To assess the impacts of the proposal on vegetation, fauna, habitats, and other environmental features as necessary
- To make recommendations regarding any environmental management and impact mitigation/amelioration measures, which can be implemented to limit the effects of the proposal on vegetation, fauna, habitats, and other environmental features as necessary.

1.1 The proposal

The current network of trails accessed by the Cruiser chairlift has one beginner and three intermediate flow style trails. Currently rider preference is shifting from moderate speed flow trails to trails with increased levels of speed, jumps and technical features. The proposed trail will be an intermediate (blue) trail that incorporates a combination of flow, freeride and park styles of trail design. The trail will have higher speed rhythm/technical sections and banked turns but will mainly be focused on jumps to promote skill development and progression. The new trail will contribute to diversifying Thredbo's trail network and creating a better riding experience for guests.

As the new trail will interconnect with the Grasshopper and Paparazzi trails it will act as an additional node in this area. As with all interconnecting trails, the new trail will contribute to a better riding experience, increase sustainability of the trail network and allow for more effective trail maintenance.

The trail commences at the junction of Grasshopper and Paparazzi, and continues downhill onto Playground ski run. This ski run has high volume of snow in winter due to drifting and is rarely accessed by grooming machines or snowmobiles. The trail heads east utilising a section of the previous alignment of the Lower All-Mountain (LAM) trail and continues under the Cruiser lift line on the existing LAM trail and then proceeds downhill back onto Playground ski run following contours into multiple berms. The trail crosses the Cruiser lift line again before joining back onto Grasshopper.

The impacts of the proposed trail can be summarized as follows:

- The clearing of shrubs and groundcovers in a 2-3 m wide corridor where the trail traverses native vegetation. The disturbance corridor is required to contain the upper and lower batters and the trail surface when the trail is traversing across moderate to steep slopes. On gentler slopes the disturbance corridor will be closer to 1.5 m. The average disturbance width is expected to be

2.5 m. The clearing will be undertaken with a mix of hand tools i.e. chainsaws and brush-cutters, and machinery i.e. mini-excavator

- Some removal of smaller trees where it is not possible to align the trail to retain all trees. In general, it is possible to align the trail to avoid tree removal. However, there will be some areas where the removal of some smaller trees and saplings is likely to be unavoidable
- Earthworks (cut and fill) to create the trail form. This will be undertaken with a mini-excavator
- Importation of some decomposed granite for the track surface where necessary
- Rock-armouring where necessary to minimise impacts on drainage areas.

An overview of the proposal is shown in Figure 1 and further identified in Photos 1-8.

The trail design and construction incorporate a range of measures to minimise and mitigate the impacts of the trail on vegetation communities and fauna habitats, and on the environment generally. The trail location has been chosen to produce a world class mountain biking experience, taking advantage of the unique landforms and vegetation of the Australia Alps, whilst avoiding locations that are particularly sensitive i.e. bogs and other wet areas, or known threatened species habitats. The proposed trail alignment also avoids land mapped within the Biodiversity Values Map (as of 8 December 2023), as defined in the NSW *Biodiversity Conservation Regulation 2017* (BC Reg), as shown in Figure 1.

Other sustainability measures which are built into the trail design and construction include rolling contours, the half rule, rock armouring, and the 10% average guideline. These measures minimise the potential for trail erosion and subsequent downstream impacts.

A more detailed description of the proposal is also provided in the Statement of Environmental Effects for the proposal (Kosciuszko Thredbo 2023).

1.2 Direct and indirect impacts

Direct impacts on flora and fauna arising from the proposal will predominantly comprise the removal or further disturbance to approximately 925 m² of native vegetation (entirely shrubland derived from the clearing of Subalpine Woodland). The required vegetation removal will be limited to the removal of understorey and groundcover vegetation and associated habitats.

Indirect impacts associated with the proposal are expected to be minor as:

- The footprint of the proposed direct impacts is relatively small.
- Some of the areas affected are already disturbed or are on the margins of disturbed areas.
- The proposal will be implemented using low impact methods and with appropriate safeguards.

The proposal is not anticipated to result in any substantial changes in surface or subsurface hydrology which may lead to the loss or adverse modification of vegetation communities or associated habitats. The trail design and construction include rolling contours, the half rule, rock armouring and 10% average guideline, which minimise the potential for trail erosion and subsequent downstream impacts. Similar trails throughout the resort, and elsewhere within Kosciuszko National Park have had negligible impact on surface and subsurface hydrology, aquatic ecosystems or vegetation communities beyond the immediate footprint. This is evident on the All Mountain Trail, where five years post construction, the bulk of the construction disturbance has been recolonised by a diverse range of native groundcovers and shrubs, as shown in Photo 9. In addition, weed and pest control is undertaken across the resort, including on trails, to ensure that the trails do not become a vector for weed invasion or for predator impacts on fauna populations.

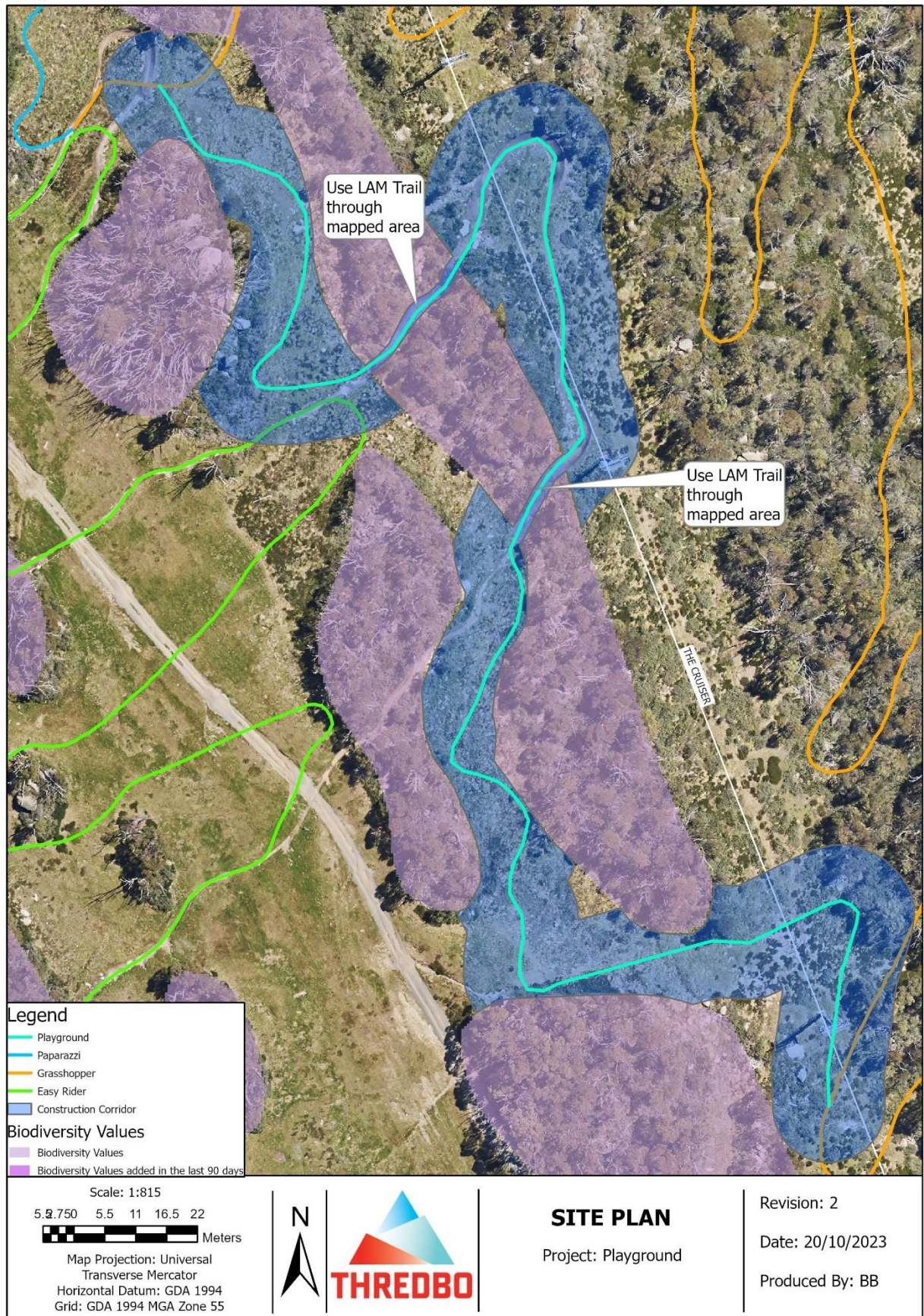


Figure 1: The proposal



Photo 1: The trail starts where it diverts from the existing Grasshopper Trail and traverse the ski slope.



Photo 2: The trail will impact heath within the existing ski run and on the margins where berms will be located.



Photo 3: The trail will rejoin the existing All Mountain Trail where it traverses Biodiversity Mapped tree islands to avoid triggering the BOS.



Photo 4: Parts to the proposed Trail will use already disturbed areas.



Photo 5: The proposed trail will be constructed to avoid the need to remove any larger trees and rocks.



Photo 6: The trail continues to descend traversing the existing ski slope.



Photo 7: The trails has been designed to avoid any clearing in tree islands that have been mapped on the Biodiversity Values map.



Photo 8: The trail finishes where it connects with the existing Grasshopper trail.



Photo 9: The All Mountain trail in the Merritts area five years post construction where native groundcovers and shrubs have reclaimed the bulk of the construction disturbance area.

1.3 Subject site, study area and locality

The “subject site” comprises those areas, as described in Section 1.1 and Figure 1, which will be directly impacted by the proposal. The “study area” extends approximately 10 m beyond the limits of the subject site given the relatively minor indirect impacts anticipated beyond the development footprint. The extent of the subject site and study area are identified in Figure 2.

The locality for the purposes of this report is the area of land within a 5 km radius of the study area.

1.4 Topography, geology and soils

The study area occupies gently to moderately sloping east facing slopes at an altitude of between approximately 1620 m and 1760 m Australian Height Datum (AHD). The study area is underlain by Silurian granodiorite (Ecology Australia 2002). Soils are likely to comprise a mix of alpine humus soils, comprising sandy clay loams. The proposed trail is within the catchment of two unnamed tributaries of the Thredbo River.

1.5 Disturbances

Parts of the study area have already been disturbed in association with the existing ski runs, ski lifts, access roads and mountain bike trails. These disturbed areas are generally dominated by native vegetation however it has been modified structurally by historic removal of tree cover and now comprises a derived shrubland. Even the disturbed parts of the study area are relatively weed free with only minor occurrences of cosmopolitan exotic grasses and herbs.

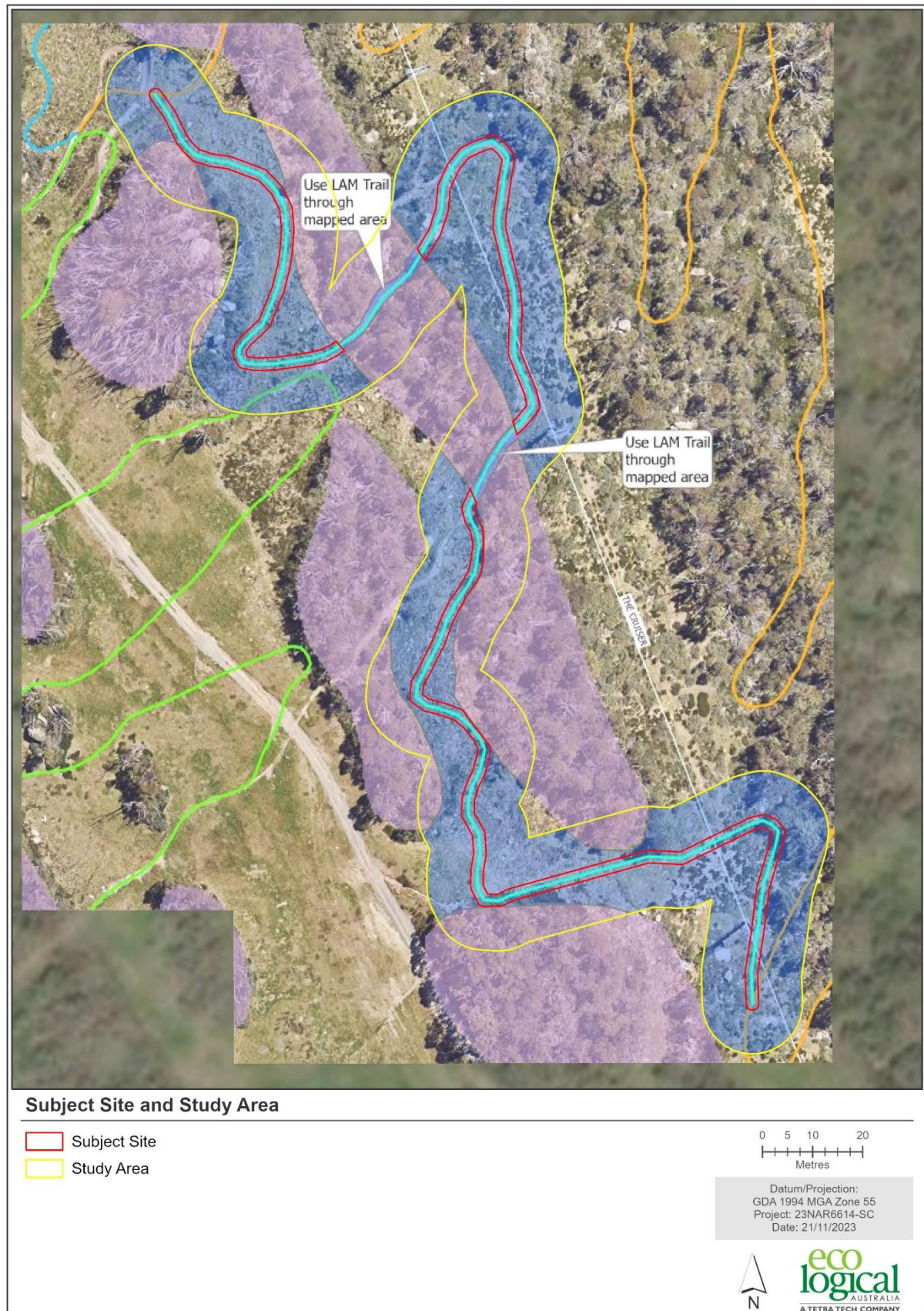


Figure 2: The subject site and study area.

1.6 Planning and legislation

It is not the intention of this assessment to document all the legislation and planning instruments that are relevant to the proposal. A detailed analysis of the statutory environment is provided in the Statement of Environmental Effects for the proposal (Kosciuszko Thredbo 2023). However, the legislation and planning instruments which are relevant to the assessment of potential impacts on terrestrial flora and fauna are discussed in brief below.

1.6.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EPA Act) is the principal planning legislation for NSW, providing a framework for the overall environmental planning and assessment of development proposals. This proposal is to be assessed under Part 4 of the EPA Act. The EPA Act places a duty on the determining authority to adequately address a range of environmental matters including the maintenance of biodiversity and the likely impact to threatened species, populations and communities.

1.6.2 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) introduces a mandatory framework for addressing impacts on biodiversity from development and clearing, including the Biodiversity Offsets Scheme (BOS) and Biodiversity Assessment Method (BAM). The proposal will not trigger the BOS, as it will not affect any land identified on the Biodiversity Values map and the total clearing of native vegetation associated with the proposal will not exceed the 1 ha threshold which applies to the Thredbo Resort Area. As such, a Biodiversity Development Assessment Report (BDAR) is not required and a flora and fauna assessment has been prepared. The impacts of the proposed development will be subject to a test of significance with respect to the Section 7.3 of the BC Act.

1.6.3 State Environmental Planning Policy (Precincts—Regional) 2021

State Environmental Planning Policy (Precincts—Regional) 2021 (Precincts-Regional SEPP) facilitates a planning framework for Special Activation Precincts (Precinct/s) in regional NSW, streamlining planning processes and guiding the delivery of the precincts. Chapter 4 Kosciuszko National Park and Alpine Resorts (SEPP Precincts-Regional 2021) identifies the Minister for Planning as the determining authority for development within the NSW Alpine Resorts. Precincts-Regional SEPP requires the Minister for Planning to refer for comment any development application in the Alpine Resorts to the Director General of the NSW Department of Environment and Heritage.

1.6.4 Environment Protection and Biodiversity Conservation Act 1999

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a national scheme for protecting the environment and conserving biodiversity values. Approval from the Commonwealth Minister is required under the EPBC Act if the action will, or is likely to, have a significant impact on matters considered to be of national environmental significance (MNES). MNES relevant to the proposal include species and ecological communities that are listed under the Act. The EPBC Act does not define significant impact but identifies matters that are necessary to take into consideration.

1.6.5 State Environmental Planning Policy (Koala Habitat Protection) 2021

State Environmental Planning Policy (Koala Habitat Protection) 2021 does not apply to lands reserved under the *National Parks and Wildlife Act 1974* and as such does not apply to the proposed development.

2. Methods

2.1 Database and literature review

Data gathered during all field studies and the literature review was analysed and interpreted in accordance with the provisions of legislation and planning controls pertaining to flora and fauna. Threatened and migratory species, threatened populations and threatened ecological communities (TECs) that have been recorded, or have the potential to occur within the locality have been assessed for their likelihood to inhabit the study area (Appendix A).

2.2 Field surveys

ELA conducted flora and fauna surveys within the study area and surrounds on 28 September 2023.

2.2.1 Flora surveys

A botanical survey was conducted in the study area by ELA Senior Ecologist Ryan Smithers on 28 September 2023.

2.2.1.1 Community identification and floristic audit

The study area was surveyed to document the flora species present, including those of conservation significance, and the location and extent of vegetation communities including any TECs encountered. All flora species encountered within the study area were identified to species level. A description of the vegetation was then prepared with general observations made of the wider area. The vegetation was assessed according to the floristic and structural classifications of Ecology Australia (2002) and plant community types (PCT).

2.2.1.2 Targeted searches

Specific searches for plant species of conservation significance known from the locality were conducted targeting areas of potential habitat. In particular, searches were undertaken for *Ranunculus anemoneus* (Anemone Buttercup).

2.2.1.3 Limitations

The floristic audit undertaken recorded as many species as possible and provides a comprehensive but not definitive species list. More species would probably be recorded during a longer survey over more seasons and years. Nevertheless, the techniques used in this investigation are considered adequate to gather the data necessary to identify potential ecological constraints to the proposal.

2.2.1.4 Flora survey effort

The flora survey effort employed a total of two person-hours.

2.2.2 Fauna surveys

Field investigations for fauna were conducted in conjunction with the flora surveys on 28 September 2023.

2.2.2.1 Habitat analysis

A description of the fauna habitats in the study area was prepared because the type of habitat in an area influences which animals occur there, as well as diversity and abundance. This habitat assessment also has an important role in predicting threatened fauna likely to occur in an area. The information collected usually includes the type of vegetation present, the presence/absence of rock habitats, tree hollows,

ponds, streams, wetlands, foraging substrates and other features likely to attract threatened fauna. The study area and immediate surrounds were traversed to identify habitat components, which were recorded and described.

2.2.2.2 Diurnal surveys

Specific searches were conducted for habitats or resources of relevance for those threatened fauna species known from subalpine and montane areas, and which might be anticipated to occur given the vegetation communities and habitats present. In particular, searches were undertaken for evidence of *Mastacomys fuscus* (Broad-toothed Rat) and for hollow-bearing trees and wombat burrows.

Opportunistic fauna surveys involved observations of animal activity, habitat surveys and searches for indirect evidence of fauna. Diurnal mammal searches were conducted in areas of potential habitat across the study area, with emphasis on searches for scats, tracks, burrows, diggings and scratchings.

2.2.2.3 Limitations

The results of fauna surveys can be optimised by conducting investigations over a long period to compensate for the effect of unfavourable weather, seasonal changes and climatic variation. In general, the longer the survey the more species will be detected. Results can also be improved by using a wide range of techniques, since some species are more likely to be detected by a particular method. However, surveys are subject to constraints that determine the amount of time allocated, the methods used and the timing of the work. Thus, the results should be viewed in the light of these limitations. The fauna detected during the survey period are a guide to the native fauna present, but are by no means a definitive list of the species occurring in the study area. Nevertheless, the techniques used in this investigation are considered adequate to identify potential ecological constraints to the proposal.

2.2.2.4 Survey effort

The fauna survey effort employed a total of two person-hours.

3. Results

3.1 Database and literature review

Appendix A provides a list of threatened and migratory species and TEC that have been recorded from database searches within a 5 km radius of the study area. The potential for each of these species to occur in the study area and the importance of the habitats within the study area are also discussed in Appendix A, and a decision made regarding the need for further assessment in this report. Some species which are not known from subalpine or montane habitats have been excluded from Appendix A.

3.2 Flora

The vegetation within the study area has been typed with reference to the classifications of Ecology Australia (2002) and into Plant Community Types (PCTs) using the revised PCTs in eastern NSW, which are part of the State Vegetation Type Map (SVTM). The study area supports one native vegetation communities; Subalpine Woodland, in two condition states; Good and Derived Shrubland, as shown in Figure 3 and Photos 1-8.

3.2.1 Subalpine Woodland

Subalpine Woodland dominates the study area and surrounds, as shown in Figure 3, and is the most common community within the subalpine area in the locality and region. It is the most dominant community within the Thredbo Resort area covering an estimated 443 ha (Ecology Australia 2002). The Subalpine Woodland within the study area is ecotonal with the Tall Alpine Heath with Eucalypts community of Ecology Australia (2002), which becomes dominant at elevations above the study area. It equates with Plant Community Type (PCT) 3381 - *Kosciuszko Alpine Sally Woodland*.

The canopy is dominated by *Eucalyptus niphophila* (Snow Gum) to a height of approximately 5-10 m and percent foliage cover (PFC) of up to 60%. The understorey is dominated by shrubs such as *Olearia phlogopappa* (Dusty Daisy-bush), *Ozothamnus secundiflorus*, *Oxylobium ellipticum* (Common Shaggy Pea), *Prostanthera cuneata* (Alpine Mint Bush), and *Tasmannia xerophila* subsp. *xerophila* (Alpine Pepperbush).

The patchy groundcover includes species such as *Poa fawcettiae* (Smooth Blue Snowgrass), *Asperula gunnii* (Mountain Woodruff), *Senecio gunnii*, *Dianella tasmanica* (Tasman Flax-lily), *Geranium potentilloides* var. *potentilloides*, *Acaena novae-zelandiae* (Bidgee Widgee), *Goodenia hederacea* subsp. *alpestris*, *Oxalis exilis*, and *Polystichum proliferum* (Mother Shield Fern).

Much of the study area comprises a shrubland that is derived from the clearing of Subalpine Woodland, as shown in Figure 3 and Photos 1-8.

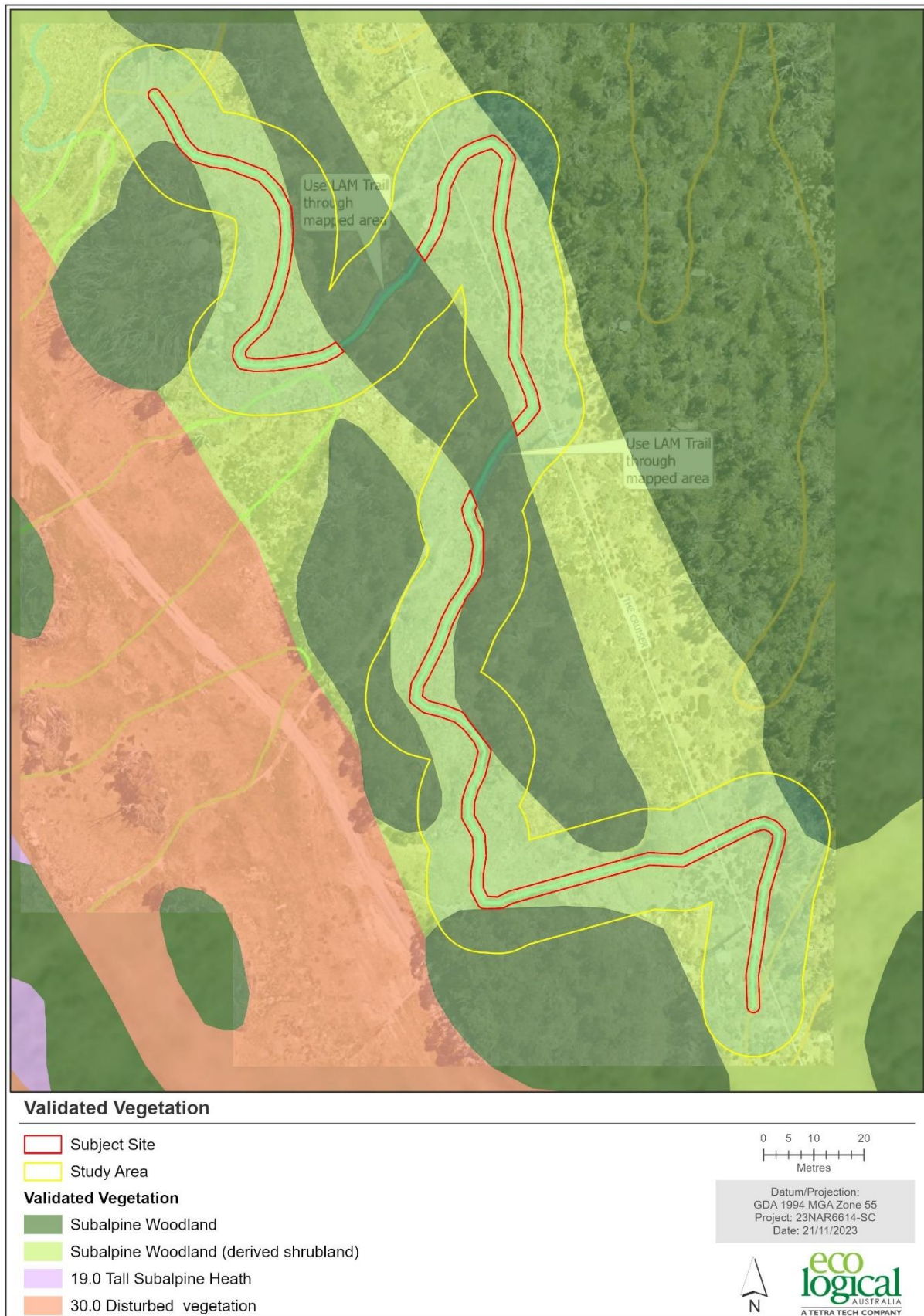


Figure 3: Vegetation within and surrounding the study area after the classifications of Ecology Australia (2002)

3.3 Fauna

3.3.1 Fauna habitats

The study area contains a limited range of fauna habitats given its narrow linear nature and the dominance of the Subalpine Woodland vegetation community. However, the study area is surrounded by extensive areas of native vegetation and as such, a relatively diverse range of native fauna are likely to occur there from time to time.

The Subalpine Woodland which dominates the study area provides habitat for native birds, terrestrial and arboreal mammals, microchiropteran bats, reptiles and invertebrates. In particular, it provides foraging value for birds such as *Callocephalon fimbriatum* (Gang-gang Cockatoo) and sheltering and nesting habitat for species such as *Acanthiza pusilla* (Brown Thornbill). Other threatened birds which may forage within the study area from time to time include *Petroica phoenicea* (Flame Robin) and *Pachycephala olivacea* (Olive Whistler), both of which are common within the Resort Area during the summer.

The Subalpine Woodlands in the Thredbo Valley are regrowth from catastrophic wildfires in 1925/26 (Banks 1986 in MGP 1996). The subsequent paucity of older or hollow-bearing trees limits sheltering habitats for hollow-dependent fauna species. No hollow-bearing trees or other nesting, breeding or roosting habitats for hollow-dependent fauna species were observed within the study area. However, some very small hollows and cavities may be present in some of the larger trees and these may be used as shelter sites by skinks, and as nesting sites by small birds.

The study area provides a small amount of potential foraging and sheltering habitat for the Broad-toothed Rat, which is likely widespread in the Thredbo Resort area (TAV 1997 and Green 2002). Other small mammal species such as *Cercartetus nanus* (Eastern Pygmy-possum), *Antechinus swainsonii* (Dusky Antechinus) and *Rattus fuscipes* (Southern Bush Rat) may also occur within the study area.

The study area provides basking and foraging resource for reptiles, including the threatened *Cyclodomorphus praealtus* (Alpine She-oak Skink), which may occur in the grassy open shrubland within the study area. It is considered unlikely that *Liopholis Guthega* (Guthega Skink) would occur within the study area given the dense understorey and paucity of suitable rock habitats associated with the Guthega Skink. Targeted surveys for the Guthega Skink elsewhere nearby by the author over many years have not detected the species nearby, with the species only being detected in the highest parts of the Thredbo Resort area at elevations of above 2000 m.

The limited water habitats within the study area provide a small foraging and breeding resource for frogs such as *Crinia signifera* (Common Eastern Froglet) and possibly other species, although no frogs were calling during the survey period. The Exotic Grasslands are likely to be utilised by exotic species such as *Lepus timidus* (Brown Hare), *Oryctolagus cuniculus* (Rabbits) and a range of deer species i.e. *Cervus unicolour* (Sambar Deer) and *Dama dama* (Fallow Deer).

4. Impact assessment

4.1 Impacts on vegetation communities

4.1.1 Subalpine Woodland

The proposal will result in the removal of approximately 925 m² of the shrubland derived from the historic clearing of Subalpine Woodland. The impacts will primarily be on understorey shrubs and groundcovers with a few eucalypt saplings also likely to be affected.

Ecology Australia (2002) estimate that there is approximately 443 ha of Subalpine Woodland within the Thredbo Resort area, and a further 184 ha within the Perisher Resort area, 183 ha at Mount Selwyn, and 5.7 ha at Charlotte Pass. Furthermore, the vast majority of the occurrence of these communities in NSW is within conservation reserves and in particular with Kosciuszko National Park.

In this context the loss of approximately 0.0925 ha of Subalpine Woodland (0.02% of the extent of the community with the Thredbo Resort area) is a relatively minor and acceptable impact.

4.2 Impacts on threatened ecological communities

The study area does not support any threatened ecological communities (TEC).

4.3 Impacts on fauna habitats

Whilst the study area provides a small amount of known or potential habitat for a range of native fauna species, including threatened species, such as Broad-toothed Rat, Eastern Pygmy-possum, Alpine She-oak Skink, Gang-gang Cockatoo, Olive Whistler, and Flame Robin, similar habitats are widespread in adjacent areas, and elsewhere within the locality, and will continue to be available to these species. The impacts associated with the proposal are limited to the removal or modification of a relatively small amount of already modified native vegetation (approximately 0.09 ha). Some sheltering and foraging habitat will be affected. However, this is a very small proportion of the sheltering and foraging habitat available in the areas immediately surrounding the study area, and the loss or modification of this habitat is not likely to adversely impact on fauna generally, or any threatened species.

The proposal will not affect any known Broad-toothed Rat nests or other important habitats for the species. No concentrations of scats or other evidence of nesting activity was detected during the survey period. Evidence of Broad-toothed Rat is widespread in the locality, and it is unlikely that a development such as proposed, would impact adversely of any individual or local population of the species.

The proposal will not adversely affect the Gang-gang Cockatoo, Olive Whistler or Flame Robin given the highly mobile nature of these species and the very small area of habitat affected relatively to the extent of similar habitat in the locality. Similarly, adverse impacts on the Alpine She-oak Skink are unlikely, given the small area of potential habitat to be affected relative to the extensive areas of similar and superior habitat in the locality.

Recommendations are provided in Section 5 to minimise impacts on wombat burrows that may be detected along the proposed trail during its construction.

The proposal will not result in substantial modifications to the hydrological environment nor will it create barriers which prevent the movement and dispersal of fauna species. Similar developments have been undertaken over the years within and in areas immediately adjacent to the study area, and elsewhere within the NSW Alps, with negligible impacts on the hydrological environment and associated ecosystems.

Under these circumstances, the impacts of the proposal on fauna habitats are relatively minor and acceptable.

4.4 Threatened species likelihood of occurrence

As a result of database searches and field surveys, the threatened species and communities identified in Table 1 are known or considered to have the potential to occur within the study area or immediate surrounds (Appendix A). The potential impact of the proposal on these entities has been assessed (Appendix B and C) pursuant to relevant statutory assessments.

Table 1: Threatened species with the potential to be affected by the proposal

Scientific Name	Common Name	FM Act	BC Act	EPBC Act	Occurrence
Fauna					
<i>Mastacomys fuscus</i>	Broad-toothed Rat	—	V	V	Likely
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	—	V	—	Potential
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	—	V	—	Known
<i>Petroica phoenicea</i>	Flame Robin	—	V	—	Known
<i>Pachycephala olivacea</i>	Olive Whistler	—	V	—	Potential
<i>Cyclodomorphus praealtus</i>	Alpine She-oak Skink	—	E	E	Potential

V = Vulnerable

4.5 Conclusion of Test of Significance

A test of significance under Section 7.3 of the BC Act was undertaken for those threatened species known within the study area and immediate surrounds or with potential to occur there (Table 1). The outcome of the assessment was that it is highly unlikely that the proposal would significantly impact on those threatened entities assessed (Appendix B).

Recommendations have been provided in Section 5 to further ameliorate the potential impacts of the proposal.

4.6 Conclusion of EPBC assessment

An impact assessment under the EPBC Act was undertaken on threatened species known within the study area and immediate surrounds or with potential to occur there (Table 1).

The outcome of this assessment was that it is highly unlikely that the development would significantly impact on the threatened entities assessed (Appendix C). A referral to the Commonwealth under the EPBC Act is not recommended.

5. Recommendations

To further mitigate the potential impacts of the proposal, the following recommendations for impact mitigation and amelioration are suggested.

Vegetation and habitat management

- All disturbance should be kept to the minimum required to achieve the proposal.
- All machinery to be used during the construction phase should be limited to the existing disturbed areas and access tracks and the proposed trail alignment as far as is possible.
- The proposed trail should be constructed and implemented in accordance with best practice design standards to ensure that there are no adverse modifications to the hydrological environment that may impact on surrounding vegetation and associated habitats.
- Appropriate safeguards should be in place during the proposed works to limit the potential for invasive plants or pathogens, chemicals or any other pollutants to enter the environment in association with the proposed development.
- If any wombat burrows need to be impacted by the proposal a wombat management plan should be developed for the proposal in consultation with NPWS.
- No vegetation clearing is to occur within the Biodiversity Values Mapped areas. The trail is to utilise the existing Lower All Mountain trail corridor in these locations.

Sediment control

- Appropriate sediment control measures should be implemented prior to any construction work for the proposal and retained in place until exposed areas of soil or vegetation are stabilised and/or revegetated.
- Drainage management and sediment control measures are to have particular regard to the prevention of any sedimentation of watercourses or vegetation communities adjoining the study area.

Rehabilitation

- Rehabilitation activities should be consistent with the resort areas rehabilitation guidelines (NGH Environmental 2007).
- Only weed-free straw or natural thatch/litter should be used in sediment control activities.

6. Conclusion

This report describes the biological environment and assesses the potential effects on threatened and migratory species, endangered populations and ecological communities of a proposal to construct the Playground mountain bike trail at Thredbo Alpine Resort.

The study area and immediate surrounds was found to support one native vegetation community: Subalpine Woodland, in two condition states Good and Derived Shrubland. No threatened flora species were recorded within the study area during the survey period. The study area does not support any endangered ecological communities. Only approximately 925 m² of Subalpine Woodland is expected to be removed in association with the proposal.

Whilst the study area provides a small amount of potential habitat for threatened fauna species such as the Broad-toothed Rat, Gang-gang Cockatoo, Olive Whistler, Eastern Pygmy-possum and Flame Robin, similar habitats are extensive in the locality and the habitats to be affected are small in the context of the extent of similar habitats contiguous with the study area. Furthermore, the proposal will not affect any potentially important habitats for threatened fauna species. The proposal will not sever any linkages between habitats or otherwise permanently restrict fauna movement.

An assessment of the effects of the proposal on threatened species, populations and ecological communities which may be directly or indirectly affected by the proposal was undertaken by applying the five factors from Section 7.3 of the *Biodiversity Conservation Act 2016*. This assessment concluded that the proposal is unlikely to have a significant effect on threatened species, populations or ecological communities or their habitats.

Following consideration of the administrative guidelines for determining significance under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999*, it is concluded that the proposal is unlikely to have a significant impact on matters of National Environmental Significance or Commonwealth land, and a referral to the Commonwealth Environment Minister is not recommended.

Notwithstanding the relatively minor impacts on vegetation and fauna habitats associated with the proposal, the impact mitigation measures described in Section 5 are also recommended to be incorporated into the proposal.

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Appendix A : Likelihood of occurrence

Summary of initial assessment to determine the likelihood of occurrence of threatened species, populations and ecological communities in the proposal site.

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. Additional flora species have been added where the study area is considered to provide potential habitat and additional fauna species that may inhabit the study area have also been included by correlating species habitat requirements with the existing environment. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the study area, results of the field survey and professional judgement.

The terms for likelihood of occurrence are defined below:

- “yes” = the species was or has been observed on the site
- “likely” = a medium to high probability that a species uses the site
- “potential” = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- “unlikely” = a very low to low probability that a species uses the site
- “no” = habitat on site and in the vicinity is unsuitable for the species.

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
FLORA						
<i>Argyrotegium nitidulum</i> <i>syn. Euchiton nitidulus</i>	Shining Cudweed	-	V	V	A mat-forming silver-leaved perennial daisy growing in tall alpine herbfield or open heathland above or close to the treeline. The species is known in NSW only from the high alpine area in the vicinity of Mt Kosciuszko. The species was not observed within the study area despite good survey coverage. There is no suitable habitat for the species within the study area.	No
<i>Calotis glandulosa</i>	Mauve Burr Daisy	-	V	V	This species appears to be a coloniser of bare patches and occurs, often on roadsides, in the subalpine habitats of the Australian Alps. The species is also known from montane grasslands dominated by <i>Poa</i> species, Natural Temperate Grassland dominated by Kangaroo Grass, and Snow Gum Woodlands in the Monaro and Shoalhaven regions. Locally it is known from the Moonbah area. There is no suitable habitat for the species within the study area.	No
<i>Carex archeri</i>	Archer's Carex	-	E	-	This species is associated with alpine herbfield, sod tussock grassland or alpine heathland and is known in NSW only from the Club Lake and upper Thredbo River areas. There is no suitable habitat for the species within the study area.	No
<i>Carex raleighii</i>	Raleigh Sedge	-	E	-	This species is associated with alpine herbfield, sod tussock grassland or alpine heathland. There is no suitable habitat for the species within the study area.	No
<i>Colobanthus curtisiae</i>	Curtis' Colobanth	-	-	V	Curtis' Colobanth is a small perennial herb growing to 40 mm high. It requires bare ground for recruitment from seed and responds well to some disturbance such as grazing. The species flowers from November to February and is largely self-pollinated. In New South Wales, the species is endemic to Kosciuszko National Park where it occurs in subalpine / montane treeless zone below 1800 m altitude. There is no habitat for the species within the study area.	No
<i>Glycine latrobeana</i>	Clover Glycine	-	CE	V	Clover Glycine is found across south-eastern Australia in native grasslands, dry sclerophyll forests, woodlands and low open woodlands with a grassy ground layer. There is no suitable habitat for the species within the study area.	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
<i>Haloragis exalata</i> subsp. <i>exalata</i>	Square Raspwort	-	-	V	The Square Raspwort appears to be a post-disturbance coloniser, based on observations of large numbers of plants on disturbed roadsides, cleared power-line easements, and recently burnt or flooded areas. The nearest populations are in the Geehi Valley. There is no suitable habitat for the species within the study area.	No
<i>Leucochrysum albicans</i> subsp. <i>tricolor</i>	Hoary Sunray	-	-	E	In NSW the Hoary Sunray occurs at relatively high elevations in woodland and open forest communities, in an area roughly bounded by Goulburn, Albury and Bega. The species has been recorded in the Yass Valley, Tumut, Upper Lachlan, Snowy River and Galong. The species is known from the South Eastern Highlands, Australian Alps and Sydney Basin bioregions. Herbarium records indicate that the taxa once occurred more widely in inland NSW, near Cobar, Dubbo, Lithgow, Moss Vale and Delegate.	No
<i>Prasophyllum bagoense</i>	Bago Leek-orchid	-	E	CE	The Bago Leek-orchid is endemic to NSW, and is currently known from a single population at McPhersons Plain, east of Tumbarumba in the Southern Tablelands. There is no suitable habitat within study area.	No
<i>Prasophyllum petilum</i>	Tarengo Leek Orchid	-	E	E	Tarengo Leek Orchid reaches to 35 cm tall. This species can be distinguished from the more common onion orchids (<i>Microtis</i> spp.) that grow in its habitat by the pinkish-purple base to the leaf. The flowering time for this species varies from north to south. Populations around Muswellbrook and Ilford tend to flower in September, with the Boorowa and Hall populations flowering in October and the Queanbeyan area and Delegate populations in December. Annual abundance varies significantly depending on winter and early spring rainfall, biomass and potentially other variables including the severity of winter frosts. Natural populations are known from a total of five sites in NSW. These are near Boorowa, Queanbeyan area, Ilford, Delegate and a newly recognised population c.10 km west of Muswellbrook. It also occurs at Hall in the Australian Capital Territory. Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Also grows in grassy woodland in association with River Tussock <i>Poa labillardieri</i> , Black Gum <i>Eucalyptus aggregata</i> and tea-trees <i>Leptospermum</i> spp. near Queanbeyan and within the grassy groundlayer dominated by Kanagaroo Grass under Box-Gum Woodland at Ilford (and Hall, ACT). There is no suitable habitat within study area.	Unlikely

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
<i>Pterostylis oreophila</i>	Blue-tongued Orchid	-	CE	CE	In New South Wales, the Blue-tongued Greenhood is known from a few small populations within Kosciuszko National Park and a population of about 40 plants (possibly now extinct) in Bago State Forest and adjoining Crown Leases south of Tumut. It grows along sub-alpine watercourses under more open thickets of Mountain Tea-tree in muddy ground very close to water. It less commonly grows in peaty soils and sphagnum mounds. It flowers from November to January. There is no suitable habitat within study area.	No
<i>Ranunculus anemoneus</i>	Anemone Buttercup	-	V	V	This perennial forb of the alpine and upper alpine zones tends to occur in areas where snow persists late into the warm season. The species is relatively common in the higher subalpine and alpine areas in the locality. This species was not observed within the study area despite good survey coverage.	No
<i>Rytidosperma pumilum</i>	Feldmark Grass	-	V	V	Felmark Grass is limited to a tiny area of feldmark - about 3ha - of the Main Range of Kosciuszko National Park between Mt Northcote and Mt Lee. There is no suitable habitat for the species within the study area.	No
<i>Rytidosperma vickeryae</i>	Perisher Wallaby Grass	-	E	-	This perennial grass is associated with treeless subalpine streamside vegetation and has been recorded from Perisher, Betts, and Spencers Creeks and tributaries, and Happy Jacks Plain. It is associated with bogs and sphagnum mounds. There is no suitable habitat for the species within the study area.	No
<i>Thesium australe</i>	Austral Toadflax	-	V	V	This species is semi-parasitic on roots of a range of grass species, mainly Kangaroo Grass.	No
<i>Xerochrysum palustre</i>	Swamp Everlasting	-	-	V	Grows in swamps and bogs which are often dominated by heaths. Also grows at the edges of bog margins on peaty soils with a cover of shrubs or grasses. Found in Kosciuszko National Park and the eastern escarpment south of Badja. Flowers appear from November to March. There is only a very small are of marginal potential habitat for the species within the study area and it is considered unlikely that it would occur there. The specie hasn't been recorded within 10 km of the study area.	Unlikely

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
ENDANGERED ECOLOGICAL COMMUNITIES						
Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps		-	EEC	-	The plant community characterizing this EEC is associated with accumulated peaty or organic-mineral sediments on poorly drained flats in the headwaters of streams. It occurs on undulating tablelands and plateaus, above 400-500 m elevation, generally in catchments with basic volcanic or fine-grained sedimentary substrates or, occasionally, granite.	No
Alpine Sphagnum Bogs and Associated Fens		-	-	EEC	This EEC is typically found in alpine, subalpine and montane environments. It can usually be defined by the presence of sphagnum moss, even though it may sometimes only be a minor component. It is dominated by shrubs or species such as Empodisma minus and is found in permanently wet areas, such as along streams, valley edges, valley floors where soils are waterlogged.	No
Natural Temperate Grassland of the Southern Tablelands (NSW and ACT)		-	CEEC	EEC	This community is associated with valleys influenced by cold air drainage and open plains in the Southern Tablelands. The vegetation communities within the study area do not comprise this community.	No
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		-	EEC	EEC	Box Gum Woodland occurs where rainfall is between 400 and 1200 mm per annum, on moderate to highly fertile soils at altitudes of 170 m to 1200 m. It occurs in an arc along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW to central Victoria	No
Snowy River Aquatic Ecological Community		EEC	-	-	The bed, banks, floodplains and associated vegetation of the Snowy River and all its tributaries potentially comprise part of this EEC. The ephemeral watercourse within the study area does not comprise this EEC.	No

Disclaimer: Data extracted from the Atlas of NSW Wildlife and EPBC Act Protected Matters Report are only indicative and cannot be considered a comprehensive inventory.

CE = Critically Endangered; E = Endangered; EEC = Endangered Ecological Community; V = Vulnerable

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
FISH						
<i>Maccullochella peelii</i>	Murray Cod	-	-	V	The Murray Cod utilises a diverse range of habitats from clear rocky streams, such as those found in the upper western slopes of NSW (including the ACT), to slow-flowing, turbid lowland rivers and billabongs. There is no suitable habitat within the study area.	No
<i>Macquaria australasica</i>	Macquarie Perch	-	-	E	The Macquarie Perch is a riverine, schooling species. It prefers clear water and deep, rocky holes with lots of cover. As well as aquatic vegetation, additional cover may comprise of large boulders, debris and overhanging banks (. Spawning occurs just above riffles (shallow running water). The Macquarie Perch was once widespread through the cooler upper reaches of the southern tributaries of the Murray-Darling river system in Victoria and New South Wales (Anonymous 1974; McDowall 1996), however its distribution did not usually extend to the sources of these rivers. There is no suitable habitat within the study area.	No
<i>Prototroctes maraena</i>	Australian Grayling	-	E	V	Currently, the Australian Grayling occurs in streams and rivers on the eastern and southern flanks of the Great Dividing Range, from Sydney, southwards to the Otway Ranges of Victoria and in Tasmania. The species is found in fresh and brackish waters of coastal lagoons, from Shoalhaven River in NSW to Ewan Ponds in South Australia. It is absent from the inland Murray-Darling system (DPI 2006; McDowall 1980b). There is no suitable habitat within the study area.	No
MAMMALS						
<i>Burramys parvus</i>	Mountain Pygmy-possum		E	E	This species lives only in the alpine and subalpine areas of the highest mountains of Victoria and NSW. It lives in rocky areas where boulders have accumulated below mountain peaks and is frequently associated with alpine heathlands dominated by Mountain Plum Pine. The nearest core habitats for the species are at Charlotte Pass. Given the absence of preferred sheltering or foraging habitat within the study area it is considered unlikely that the species would occur there.	Unlikely
<i>Cercartetus nanus</i>	Eastern Pygmy-possum		V	-	The Eastern Pygmy-possum is found in wet and dry eucalypt forest, subalpine woodland, coastal banksia woodland and wet heath. Pygmy-Possums feed mostly on the pollen and nectar from Banksias, Eucalypts and understorey	Potential

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					plants and will also eat insects, seeds and fruit. The presence of Banksia sp. and Leptospermum sp. are an important habitat feature. Small tree hollows are favoured as day nesting sites, but nests have also been found under bark, in old bird nests and in the branch forks of tea-trees. The Eastern Pygmy-possum appears to be mainly solitary, each individual using several nests, with males having non-exclusive home-ranges of about 0.68 hectares and females about 0.35 hectares. They are mainly nocturnal. The Eastern Pygmy-possum is found in south-eastern Australia, from southern Queensland to eastern South Australia and in Tasmania. In NSW it extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes.	
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll		V	E	The species prefers moist forest types and is often associated with escarpments. There is no denning habitat for the species within the study area and the potential foraging habitat within the study area would form only a small proportion of the home range of the species, which has been estimated at between 800 ha and 2000 ha.	Unlikely
<i>Mastacomys fuscus</i>	Broad-toothed Rat		V	V	This species occurs in two widely separated areas in NSW, the Barrington Tops area and the wet alpine and subalpine heaths and woodlands of the Kosciuszko NP and adjacent areas. The species lives in a complex of runways through dense vegetation of wet grass, sedge or heath and under the snow in winter.	Potential
<i>Petauroides volans</i>	Greater Glider		-	V	This species is associated with tall moist forests. It would not occur within the study area.	No
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby		E	V	This species prefers rocky habitats, including loose boulder-piles, rocky outcrops, steep rocky slopes, cliffs, gorges and isolated rock stacks. The nearest known population is more than 50 km southeast of the study area.	No
<i>Phascolarctos cinereus</i>	Koala		V	V	Associated with both wet and dry Eucalypt forest and woodland that contains a canopy cover of approximately 10 to 70% with acceptable Eucalypt food trees. It is highly unlikely that the species would ever occur in the study area and would not be resident there.	No
<i>Pseudomys fumeus</i>	Smoky Mouse		E	E	Occurs in heath on ridge tops and slopes in sclerophyll forests, heathland and open forest along the coast and inland to sub-alpine regions. Occasionally	Unlikely

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					occurs in ferny gullies. It is considered highly unlikely that the species would occur within the study area or immediate surrounds give its rarity and the nature of the habitats there.	
<i>Pteropus poliocephalus</i>	Grey-headed Flying-Fox		V	V	Inhabits a wide range of habitats including rainforest, mangroves, paperbark forests, wet and dry sclerophyll forests and cultivated areas. Camps are often located in gullies, typically close to water, in vegetation with a dense canopy. There are no camps in the locality and the species would not occur within the study area.	No
AMPHIBIANS						
<i>Litoria spenceri</i>	Spotted Tree Frog		CE	E	The Spotted Tree Frog is associated with a range of vegetation communities from montane forest at high altitudes to wet and dry forest at moderate to low altitudes respectively. It occurs along sections of streams with steep banks, invariably in steeply dissected country or gorges with numerous rapids and waterfalls. It is restricted to riffle and cascade stream sections with exposed rock banks, resulting in a highly patchy distribution along most streams. Adults and juveniles most likely remain in the vicinity of the stream, rarely venturing far from the riparian zone. Tadpoles occur predominantly in slow-flowing sections of streams. There is no suitable habitat within the study area.	No
<i>Litoria raniformis</i>	Southern Bell Frog		E	V	This species is usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys and in irrigated rice crops, particularly where there is no available natural habitat. There is no suitable habitat within the study area.	No
<i>Litoria verreauxii alpina</i>	Alpine Tree Frog		E	V	This species occurs in the alpine and subalpine zones of south-eastern NSW and Victoria. It is found in a wide variety of habitats including woodland, heath, grassland and herbfields. It breeds in natural and artificial wetlands including ponds, bogs, fens, streamside pools, dams and drainage channels that are still or slow flowing. The species has disappeared from much of its former range in the last 20 years and is restricted to a few breeding sites in murky ponds. There is no suitable breeding habitat for the species within the study area and it is highly unlikely that it would occur there.	Unlikely

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
<i>Pseudophryne corroboree</i>	Southern Corroboree Frog		CE	CE	The Southern Corroboree Frog is limited to sphagnum bogs of the northern Snowy Mountains, in a strip from the Maragle Range in the northwest, through Mt Jagungal to Smiggin Holes in the south. Its range is entirely within Kosciuszko National Park. This species is all but extinct in the wild. It is no longer present at its former southern limit at Smiggin Holes.	No

REPTILES

<i>Aprasia parapulchella</i>	Pink-tailed Worm Lizard		V	V	Inhabits sloping, open woodland areas with predominantly native grassy ground layers, particularly those dominated by Kangaroo Grass. Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Appear to spend considerable time in burrows below rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites. The study area does not support suitable habitat for the species. The nearest records of the species are more than 50 km away at Cooma.	No
<i>Cyclodomorphus praealtus</i>	Alpine She-oak Skink		E	E	In NSW, the species is known from open alpine heath and tussock grassland within the Kosciuszko region, preferring treeless or lightly treed areas. The study area does include potential habitat for this species and it is possible that it would occur there.	Potential
<i>Liopholis guthega</i>	Guthega Skink		E	E	This species is known from the Snowy Mountains and the Bogong High Plains and is associated with rocky areas in a range of alpine and subalpine vegetation communities. The species lives in extensive colonies associated with a deep burrow network that is constructed in eroded granite and humus soils beneath boulders and shrubs. The species has not been recorded in close proximity to the study area despite targeted surveys and it is considered unlikely that it would occur there.	Unlikely

BIRDS

<i>Anthochaera phrygia</i>	Regent Honeyeater		CE	CE, M	Associated with temperate eucalypt woodland and open forest including forest edges, wooded farmland and urban areas with mature eucalypts, and riparian forests of River Oak (<i>Casuarina cunninghamiana</i>). The Regent Honeyeater primarily feeds on nectar from box and ironbark eucalypts and occasionally from banksias and mistletoes. As such it is reliant on locally	No
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Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow		V	-	<p>abundant nectar sources with different flowering times to provide a reliable supply of nectar. The species would not occur within the study area.</p> <p>Dusky woodswallows are widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. They primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.</p>	Unlikely
<i>Botaurus poiciloptilus</i>	Australasian Bittern		V	E	<p>This species favours permanent freshwater wetlands with tall, dense vegetation, particularly bulrushes and spikerushes. It hides during the day amongst dense reeds and feeds at night. It breeds during summer with nest built in secluded places in densely vegetated wetlands on a platform of reeds. There is no habitat for the species within the study area.</p>	No
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo		V	E	<p>Gang-gang Cockatoos live as pairs inhabiting woodlands of south-eastern Australia. The species feeds primarily on the seeds of eucalypts and acacias and breeds in tree hollows. The species is typically associated with taller montane forests in the region but is sometimes observed foraging in Snow Gums and on the side of roads. It's likely that the species would forage within the study area from time to time.</p>	Yes
<i>Daphoenositta chryoptera</i>	Varied Sittella		V	—	<p>The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands, with a nearly continuous distribution in NSW from the coast to the far west. It inhabits eucalypt forests and woodlands, especially rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. It is considered unlikely that the species would occur within the study area.</p>	Unlikely
<i>Falco hypoleucos</i>	Grey Falcon		E	-	<p>The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than</p>	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW. The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW.	
<i>Grantiella picta</i>	Painted Honeyeater		V	V	The Painted Honeyeater is a nomadic species that occurs predominantly on the inland slopes of the Great Dividing Range. It inhabits Boree (<i>Acacia pendula</i>), Brigalow (<i>A. harpophylla</i>) and Box-Gum Woodlands and Box-Ironbark Forests. It is a specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias, preferring mistletoes of the genus <i>Amyema</i> . Nesting occurs from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping <i>Eucalyptus</i> spp., <i>Allocasuarina</i> and <i>Casuarina</i> spp. (Sheoaks), <i>Melaleuca</i> sp. (Paperbark) or Mistletoe branches. It is highly unlikely that the species would occur within the study area.	Unlikely
<i>Lathamus discolor</i>	Swift Parrot		E	CE	Breeds in Tasmania between September and January. Migrates to mainland in autumn, where it forages on profuse flowering Eucalypts. Hence, in this region, autumn and winter flowering eucalypts are important for this species. Favoured feed trees include winter flowering species such as Swamp Mahogany (<i>Eucalyptus robusta</i>), Spotted Gum (<i>Corymbia maculata</i>), Red Bloodwood (<i>C. gummifera</i>), Mugga Ironbark (<i>E. sideroxylon</i>), and White Box (<i>E. albens</i>). It is considered highly unlikely that the species would occur within the study area.	Unlikely
<i>Neophema chrysogaster</i>	Orange-bellied Parrot		E	CE, M	Breeds only in coastal south-west Tasmania and spends the winter in coastal Victoria and South Australia. It nests in hollows in eucalypt trees which grow adjacent to its feeding plains. In early October the birds arrive in the south west and depart after the breeding season usually in March and April. It feeds on the seeds of several sedges and heath plants, including buttongrass. Its main food preferences are found in sedgelands which have not been burned for between 3-15 years. Also included in the diet are seeds of three <i>Boronia</i> species and the everlasting daisy (<i>Helichrysum pumilum</i>). After breeding,	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					migrating birds move gradually northwards up the west coast, through the Hunter Group and King Island in Bass Strait and on to the mainland. On the journey the birds usually feed on beach-front vegetation including salt tolerant species such as sea rocket (<i>Cakile maritima</i>). They also eat various coastal native and introduced grasses. There is no habitat for the species within the study area.	
<i>Pachycephala olivacea</i>	Olive Whistler		V	-	This species is usually associated with moist tall forests at high elevations but has been occasionally recorded at lower altitudes. Breeding occurs above 300m within habitats providing both a thick understorey and moderate canopy. In the alps the species is more typically associated with subalpine woodlands with a heathy understorey. It is likely that the species would occur within the study area from time to time.	Potential
<i>Petroica rodinogaster</i>	Pink Robin		V	-	The Pink Robin is found in Tasmania and the uplands of eastern Victoria and far south-eastern NSW, almost as far north as Bombala. It inhabits rainforest and tall, open eucalypt forest, particularly in densely vegetated gullies. In the alps the species is more typically associated with Montane Forests rather than subalpine woodlands with a heathy understorey.	Unlikely
<i>Petroica boodang</i>	Scarlet Robin		V	-	This species is found in south-eastern Australia and south-west Western Australia. In NSW it occupies open forests and woodlands from the coast to the inland slopes. The Scarlet Robin breeds in drier eucalypt forests and temperate woodlands, often on ridges and slopes, within an open understorey of shrubs and grasses. Abundant logs and coarse woody debris are important structural components of its habitat. In autumn and winter it migrates to more open habitats such as grassy open woodland or paddocks with scattered trees. There is no suitable habitat for the species within the study area and it is considered unlikely that it would occur there.	Unlikely
<i>Petroica phoenicea</i>	Flame Robin		V	-	The Flame Robin is found in south-eastern Australia (Queensland border to Tasmania, western Victoria and south-east South Australia). In NSW it breeds in upland moist eucalypt forests and woodlands, often on ridges and slopes, in areas of open understorey. It migrates in winter to more open lowland habitats such as grassland with scattered trees and open woodland on the inland slopes and plains. The species is well known from the locality and	Known

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					would likely use the more open habitats within the study area from time to time for foraging.	
<i>Rostratula australis</i>	Australian Painted Snipe		E	E	In NSW, records of the Painted Snipe are from the Murray-Darling Basin, including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp, and swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. It prefers the fringes of swamps, dams and nearby marshy areas, where there is a cover of grasses, Lignum, low scrub or open timber. It nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. There is no suitable habitat for the species within the study area.	No
MIGRATORY TERRESTRIAL AND WETLAND SPECIES LISTED UNDER EPBC ACT						
<i>Hirundapus caudacutus</i>	White-throated Needletail		—	M	Forages aerially over a variety of habitats usually over coastal and mountain areas, most likely with a preference for wooded areas. Has been observed roosting in dense foliage of canopy trees, and may seek refuge in tree hollows in inclement weather.	Unlikely
<i>Merops ornatus</i>	Rainbow Bee-eater		—	M	Resident in coastal and subcoastal northern Australia; regular breeding migrant in southern Australia, arriving September to October, departing February to March, some occasionally present April to May. Occurs in open country, chiefly at suitable breeding places in areas of sandy or loamy soil: sand-ridges, riverbanks, road-cuttings, sand-pits, occasionally coastal cliffs (ibid). Nest is a chamber at the end of a burrow, up to 1.6 m long, tunnelled in flat or sloping ground, sandy back or cutting (ibid). The species would not occur within the study area.	No
<i>Monarcha melanopsis</i>	Black-faced Monarch		—	M	This migratory species is known to breed in damp forest types and forage in rainforest and eucalypt forest. The species would not occur within the study area.	No
<i>Myiagra cyanoleuca</i>	Satin Flycatcher		—	M	This species inhabits lowland eucalypt forests. It is known to nest in dense gully vegetation. The species would not occur within the study area.	No
<i>Neophema chrysogaster</i>	Orange-bellied Parrot		E	E, M	SEE DIURNAL BIRDS ABOVE	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
<i>Rhipidura rufifrons</i>	Rufous Fantail		—	M	This migratory species forages by catching flying insects and is known to utilise the aerial foraging space above the dense understorey in damp forests or beside rivers. The species would not occur within the study area.	No
<i>Xanthomyza phrygia</i>	Regent Honeyeater		E	E, M	SEE DIURNAL BIRDS ABOVE	No
<i>Gallinago hardwickii</i>	Latham's Snipe		E	M	Resides in swamps, dams and nearby marshy areas that contain grasses, lignum, low scrub or open timber that provides cover. It is considered highly unlikely that the species would occur within the study area.	Unlikely
<i>Motacilla flava</i>	Yellow Wagtail		—	M	Frequents open wetlands along the bare shores of freshwater swamps, crops and bare bore drains, as well as short-grassed fields and rocky coasts. It is considered highly unlikely that the species would occur within the study area.	Unlikely

Disclaimer: Data extracted from the Atlas of NSW Wildlife and EPBC Act Protected Matters Report are only indicative and cannot be considered a comprehensive inventory. 'Migratory marine species' and 'listed marine species' listed on the EPBC Act (and listed on the DEW protected matters report) have not been included in this table, since they are considered unlikely to occur within the study area due to the absence of marine and wetland habitats.

CE = Critically Endangered; E = Endangered; V = Vulnerable; M = Migratory

Appendix B : Test of significance

Test of significance pursuant to section 7.3 of the BC Act: Five-part test

An assessment of the effects of the proposal on threatened species, populations and ecological communities which may be directly or indirectly affected by the proposal may be carried out by applying the five factors from Section 7.3 of the BC Act.

This test of significance is presented below for the threatened fauna species:

- *Mastacomys fuscus* (Broad-toothed Rat)
- *Cercartetus nanus* (Eastern Pygmy-possum)
- *Callocephalon fimbriatum* (Gang-gang Cockatoo)
- *Petroica phoenicea* (Flame Robin)
- *Pachycephala olivacea* (Olive Whistler)
- *Cyclodomorphus praealtus* (Alpine She-oak Skink)

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

Broad-toothed Rat *Mastacomys fuscus* (potential occurrence)

The Broad-toothed Rat generally occurs in two widely separated areas in NSW, the Barrington Tops area and the wet alpine and subalpine heaths and woodlands of the Kosciuszko NP and adjacent areas. The species lives in a complex of runways through dense vegetation of wet grass, sedge or heath and under the snow in winter. Home range size is thought to range between approximately 0.1 ha and 0.27 ha. Individuals nest alone over summer but congregate in communal nests during winter. The species is thought to be locally common in the alpine and high subalpine tracts of the Snowy Mountains area (Green 2002), where suitable habitats are present.

The study area provides a small amount of potential foraging and sheltering habitat for the Broad-toothed Rat.

The proposed development will affect some potential habitat for the species, however, it will affect only a very small amount of the potential habitat for the species in the Thredbo Resort area. The proposed development will not affect any key resources for the species, and the habitats immediately adjoining the study area will continue to be available to the species after the implementation of the proposed development. As such, the proposed development is unlikely to adversely affect a significant proportion of the home range of any Broad-toothed Rat individuals.

The proposed development will not result in habitat fragmentation which could isolate individuals or a population of the Broad-toothed Rat, given the narrowness of the proposed trail. Under these circumstances, the proposed development is considered unlikely to disrupt the life cycle of the Broad-toothed Rat such that a viable local population is likely to be placed at risk of extinction.

Eastern Pygmy-possum *Cercartetus nanus* (potential occurrence)

The Eastern Pygmy-possum is found in wet and dry eucalypt forest, subalpine woodland, coastal banksia woodland and wet heath. Pygmy-Possums feed mostly on the pollen and nectar from Banksias, Eucalypts and understorey plants and will also eat insects, seeds and fruit. The presence of Banksia sp. and Leptospermum sp. are an important habitat feature. Small tree hollows are favoured as day nesting sites, but nests have also been found under bark, in old bird nests and in the branch forks of tea-trees. The Eastern Pygmy-possum appears to be mainly solitary, each individual using several nests, with males having non-exclusive home-ranges of about 0.68 hectares and females about 0.35 hectares. They are mainly nocturnal. The Eastern Pygmy-possum is found in south-eastern Australia, from southern Queensland to eastern South Australia and in Tasmania. In NSW it extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes. There are a few records of the species from Kosciuszko National Park, mainly from lower altitudes, however the species has been recorded at 1800 m. It is likely that the Eastern Pygmy-possum occurs in the subalpine and montane habitats of the Thredbo Resort.

The proposed trail is unlikely to adversely affect a significant proportion of the home range of any individual Eastern Pygmy-possum given that it comprises a narrow linear development. It is unlikely that any individual Eastern Pygmy-possum would be directly affected by the proposed trail given the relatively small area to be affected during the construction phase, and that the disturbances during construction are likely to encourage any individuals that may be within the disturbance corridor, to move away. Direct impacts during the use of the trail are unlikely given that the species is primarily nocturnal.

The proposal is highly unlikely to disrupt the life cycle of the Eastern Pygmy-possum such that a viable local population of the species is likely to be placed at risk of extinction.

Gang-gang Cockatoo *Callocephalon fimbriatum* (known occurrence)

In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the central and southern tablelands and south-west slopes. In summer, this species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, the Gang-gang Cockatoo may occur at lower altitudes in drier more open eucalypt forests and woodlands, and is often found in urban areas. It may also occur in sub-alpine Snow Gum woodland and occasionally in temperate rainforests.

The species is regularly observed at Thredbo in montane and subalpine areas in the region and was heard calling near the study area during the survey period. Whilst the species may forage within the study area, it would not breed there given the absence of suitable nesting habitat. Given the extensive forests within the locality, breeding and roosting habitat is likely to be relatively abundant.

The study area provides a very small area of suitable foraging resources for the species. However the proposal is unlikely to result in any impacts on foraging resources (generally eucalypt trees) for the species.

Under these circumstances, the proposed development will not disrupt the life cycle of the Gang-gang Cockatoo such that a viable local population of the species is likely to be placed at risk of extinction.

Flame Robin *Petroica phoenicea* (known occurrence)

The Flame Robin is found in south-eastern Australia (Queensland border to Tasmania, western Victoria and south-east South Australia). In NSW it breeds in upland moist eucalypt forests and woodlands, often on ridges and slopes, in areas of open understorey. It migrates in winter to more open lowland habitats such as grassland with scattered trees and open woodland on the inland slopes and plains. There are numerous records of the species throughout the NSW Alps, and the species was observed in the study area during the survey period. It is well known from the Thredbo Resort area and is one of the most common birds of open habitats outside of the winter period.

The proposal will affect a very small amount of potential nesting and foraging habitat for the species. This is negligible in the context of the extensive areas of similar habitat within the Thredbo Resort area that will not be affected by the proposed development and which will continue to be available to the species. The species is not sedentary and undertakes substantial seasonal migrations, reducing the species dependence on any specific area of known or potential habitat.

Under these circumstances, the proposed development is unlikely to disrupt the life cycle of the Flame Robin such that a viable local population of the species is likely to be placed at risk of extinction.

Olive Whistler *Pachycephala olivacea* (potential occurrence)

The Olive Whistler is found in south-eastern Australia (Queensland border to Tasmania, western Victoria and south-east South Australia). In the NSW Alps, it is associated with areas of tall dense heath, particularly riparian Tea-tree scrubs. It breeds in the thick understorey of moist eucalypt forests and subalpine woodlands. It migrates in winter to lowland habitats. There are numerous records of the species throughout the NSW Alps including within the Thredbo Resort area where it is considered a common resident.

The proposed development will result in the loss of a small amount of potential foraging and breeding habitat for the Olive Whistler. Whilst this comprises an adverse impact on the species, the habitat to be removed is very small relative to the extensive areas of similar habitat which occurs within the Thredbo Resort area and elsewhere in the locality. Extensive areas of potential habitat for the species is contiguous with the study area in the extensive Subalpine Woodland and Subalpine Riparian Scrub within the Thredbo Valley. The species is highly mobile and considered to be common within the Thredbo Valley and the Thredbo Valley population is considered to be contiguous with other populations to the north and south (MGP 1996).

Under these circumstances it is considered unlikely that the proposed development would affect the life cycle of the Olive Whistler such that a viable local population of the species is likely to be placed at risk of extinction.

Alpine She-oak Skink *Cyclodomorphus praealtus* (Potential occurrence)

The Alpine She-oak Skink is a slender lizard reaching a maximum length of 350 mm. It is largely carnivorous mostly eating invertebrates but also small lizards and snakes. In NSW, the species is known from alpine and subalpine open heath and tussock grassland within the Kosciuszko region, preferring treeless or lightly treed areas. It is negatively associated with increasing structural diversity (Sato. et al. 2014) and is thus negatively associated with the dense heath habitats that characterise much of the study area. Within NSW the species is known to occur from the South Ramshead area to Kiandra. It is rarely encountered, appearing to mostly lie partially hidden amongst groundcovers.

The study area supports some potential habitats for the species, particularly in the derived shrublands, which are characterised dense grassy areas and scattered or patches of shrubs.

Although there are no records of the species from the Thredbo Resort area, it is still possible, that the species occurs within the study area. The species is considered to be particularly cryptic, and difficult to detect even using methods such as artificial shelter and trapping surveys.

Whilst the proposed trail will traverse some areas of potential habitat for the Alpine She-oak Skink, the proposal involves only a narrow band of disturbance, which would be unlikely to compromise a significant proportion of the home range of any Alpine She-oak Skink individuals which may occur within the study area or immediate surrounds. In addition, given the species habit of mostly lying partially hidden amongst groundcovers, it is considered unlikely to bask on the proposed trail, and thus to potentially be at risk of being run over by mountain bikers. There is no evidence of the species basking on the other walking and mountain biking trails, or access roads within Kosciuszko National Park, nor any evidence of mortality of the species through “road/trail kills”.

It is considered highly unlikely that the narrow trail surface would comprise a significant barrier to the movement or dispersal of any Alpine She-oak Skinks, or that the trail would lead to greater predation pressure on the species.

Extensive areas of habitat similar to those within the study area occur in contiguous habitats.

Under these circumstances, it is considered unlikely that the proposal will have an adverse effect on the life cycle of the Alpine She-oak Skink such that a viable local population of the species is likely to be placed at risk of extinction.

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

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

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

There are no endangered or critically endangered ecological communities within the study area.

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

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

The proposed development will impact on only a very small area (0.09 ha) of potential habitat for the Broad-toothed Rat, Eastern Pygmy-possum and Alpine She-oak Skink and will not affect any known Broad-toothed Rat communal nesting or likely breeding sites. The proposed development will result in the modification of a very small amount of potential foraging and breeding habitat (0.09 ha) for the Flame Robin and Olive Whistler, and only a very small amount of potential foraging habitat for the Gang-gang Cockatoo.

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

The proposed development primarily involves a narrow band of clearing of understorey and groundcover vegetation. The proposed clearing will not sever connectivity between the fauna habitats

within the study area and contiguous habitats, or isolate any fauna populations which may occur within the study area. The disruptions to connectivity between fauna habitats will be minor, typically less than 2 m in width. This is considered highly unlikely to sever connectivity between habitats even for relatively immobile species with small home ranges such as some small mammals and reptiles.

The effects of the action proposed on habitat connectivity will be minor and the native fauna which may occur within the study area from time to time, will continue to be able to traverse the study area.

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

The potential Broad-toothed Rat habitats to be affected comprise a small area of marginal habitat relative to the extensive areas of similar and superior habitats provided by contiguous vegetation. The alpine, subalpine and montane heaths in the locality provide superior habitat for the species than the habitats within the study area. No evidence of any important communal nesting sites was observed within the study area. Under these circumstances, the habitats to be affected are not considered to be particularly important for Broad-toothed Rat.

The habitat to be removed by the proposal is highly unlikely to be important to the long-term survival of the Eastern Pygmy-possum in the locality given that it comprises only a relatively small amount of potential habitat for the species relative to the extensive areas of remnant forest, woodland and heath within the locality and that there are no records of the species within the Thredbo Resort area.

In the context of the extent of similar habitat available for the Alpine She-oak Skink, Gang-gang Cockatoo, Olive Whistler, and Flame Robin in the Thredbo Resort area and elsewhere in the locality, the habitats within the study area are not considered to be important.

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

The proposed development will not affect any area of outstanding biodiversity value.

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

The proposed development will remove 0.09 ha of remnant native vegetation. Whilst this constitutes the Key Threatening Process 'Clearing of native vegetation', the contribution to this key threatening process is relatively minor considering the extent of remnant forest in the locality and the extant extent of the vegetation communities that will be affected.

Appendix C: EPBC Act Significant Impact Criteria

The EPBC Act Administrative Guidelines on Significance set out ‘**Significant Impact Criteria**’ that are to be used to assist in determining whether a proposed action is likely to have a significant impact on matters of national environmental significance. Matters listed under the EPBC Act as being of national environmental significance include:

- Listed threatened species and ecological communities;
- Listed migratory species;
- Wetlands of International Importance;
- The Commonwealth marine environment;
- World Heritage properties;
- National Heritage places;
- Nuclear actions; and
- Great Barrier Reef.

Specific ‘**Significant Impact Criteria**’ are provided for each matter of national environmental significance except for threatened species and ecological communities in which case separate criteria are provided for species listed as endangered and vulnerable under the EPBC Act.

Threatened and migratory species listed under the EPBC Act that are considered likely or potentially to occur within the study area are given in **Appendix A** of the Report. The only Commonwealth listed species which are considered to have the potential to occur within the study area are the Broad-toothed Rat and the Gang-gang Cockatoo.

The relevant Significant Impact Criteria have been applied to determine the significance of impacts associated with the proposal.

Matters to be addressed	Impact
(a) any environmental impact on a World Heritage Property or National Heritage Places;	<p>No. The proposal does not impact on a World Heritage Property or a National Heritage Place as addressed in the SEE.</p> <p>(listed natural: Australian Alpine National Parks and Reserves; nominated historic: Snowy Mountains Scheme NSW).</p>
(b) any environmental impact on Wetlands of International Importance;	<p>No. The proposal will not affect any part of Ramsar wetland.</p>
(c) any impact on Commonwealth Listed Critically Endangered or Endangered Species;	<p>Yes. The study area provides potential habitat for two Commonwealth listed endangered species: the Gang-gang Cockatoo and Alpine She-oak Skink.</p> <p>The significant impact criteria for endangered species are discussed below:</p> <p>a. lead to a long-term decrease in the size a population of a species,</p> <p>The proposed action will not remove any foraging habitat for the species. The proposal will not affect any breeding or roosting habitat or otherwise adversely impact the species.</p>

Matters to be addressed	Impact
	<p>Under these circumstances, the proposed action will not lead to a long-term decrease in the size of the Gang-gang Cockatoo population.</p> <p>Approximately 0.09 ha of potential habitat for the Alpine She-oak Skink will be affected. Whilst this involves the loss of some potential habitat for the species, it is a very small area in the context of the extent of similar and superior habitat in the areas surrounding the study area.</p> <p>The proposal involves only a narrow band of disturbance, which is unlikely to compromise the home range of one or more Alpine She-oak Skink individuals.</p> <p>Given the Alpine She-oak Skink habit of mostly lying partially hidden amongst groundcovers, it is considered unlikely to bask on the proposed trail, and thus to potentially be at risk of being run over by mountain bikers.</p> <p>Under these circumstances, it is considered unlikely that the proposal will lead to a long-term decrease in the size of the Alpine She-oak Skink population.</p>
	<p>b. reduce the area of occupancy of the species</p> <p>The proposed action will be limited to the loss or further modification of 0.09 ha of native vegetation which is a small amount of habitat in the context of the extent of similar habitats in the locality generally. The proposed works will not affect any key habitat resources for the Gang-gang Cockatoo; nor affect the species ability to access habitats within or beyond the study area.</p> <p>Under these circumstances, the proposed action is highly unlikely to reduce the area of occupancy of the local population of the Gang-gang Cockatoo.</p> <p>The approximately 0.09 ha of potential habitat for the Alpine She-oak Skink that will be substantially modified by the proposal is a very small area in the context of the extent of similar and superior habitat in the areas surrounding the study area. Even if the species does occur within the study area, the narrow linear nature of the areas affected is such that it is unlikely to prevent any individuals from continuing to occur there.</p> <p>As such, it is considered unlikely that the proposal will reduce the area of occupancy of the of the Alpine She-oak Skink population.</p>
	<p>c. fragment an existing population into two or more populations</p> <p>The proposed action will be limited to the loss or further modification of 0.09 ha of native vegetation which is a small amount of habitat in the context of the extent of similar habitats in the locality generally. The proposed works will not affect any key habitat resources for the Gang-gang Cockatoo; nor affect the species ability to access habitats within or beyond the study area.</p> <p>Under these circumstances, the proposed action will not fragment an existing population of the Gang-gang Cockatoo into two or more populations.</p> <p>The proposal involves disturbances to a narrow corridor up to 2.5 m wide in association with the proposed trail. The proposed narrow trail is unlikely to represent a barrier to any individual of the Alpine She-oak Skink. As such, the proposal is unlikely to fragment any local population of the Alpine She-oak Skink into two or more populations.</p>
	<p>d. adversely affect habitat critical to the survival of a species</p> <p>No habitat within the development site is considered likely to be critical to the survival of the Gang-gang Cockatoo. There are thousands of hectares of similar habitats in the alpine and subalpine zones of the Australian alps, including elsewhere within the Thredbo Resort area. The Gang-gang Cockatoo continues to occur within the Thredbo Resort Area despite a long history of similar and more extensive disturbances.</p> <p>No habitat within the study area is considered to be critical to the survival of the Alpine She-oak Skink. The species is not known from the study area and there are thousands of hectares of similar habitats in the alpine and subalpine zones of the Australian alps, including elsewhere within the Thredbo Resort area.</p>
	<p>e. disrupt the breeding cycle of a population</p>

Matters to be addressed	Impact
	<p>It is considered highly unlikely that the Gang-gang Cockatoo would breed within the study area given the absence of hollow-bearing trees.</p> <p>Under these circumstances, the proposed action will not disrupt the breeding cycle of a population of the Gang-gang Cockatoo.</p> <p>Given the absence of records of the Alpine She-oak Skink within the study area it is unlikely, although possible that they may breed within the study area, however any local populations of the species would not be limited to the study area, which represents a negligible proportion of the potential habitat available to the species in the locality. The study area is also contiguous with large areas of similar, and less disturbed habitats.</p> <p>Under these circumstances, it is highly unlikely that the proposal would disrupt the breeding cycle of a population of the Alpine She-oak Skink.</p> <p>f. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline</p> <p>The proposed action will modify a very small area of habitat for the Gang-gang Cockatoo, but this area is unlikely to be important to the species in the context of the extent of potential habitat in the locality.</p> <p>Under these circumstances it is highly unlikely that the proposed action would modify- destroy-remove or isolate or decrease the availability or quality of habitat to the extent that the Gang-gang Cockatoo is likely to decline.</p> <p>The proposal will remove or modify a relatively small area of potential habitat for the Alpine She-oak Skink, which is unlikely to be important to the species in the context of the extent of potential habitat for these species in the locality.</p> <p>There are no records of the species within the study area or immediate surrounds and the potential habitat within the study area.</p> <p>Under these circumstances, it is highly unlikely that the proposal would modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the Alpine She-oak Skink is likely to decline.</p> <p>g. result in invasive species that are harmful to an endangered species becoming established in the endangered or critically endangered species' habitat</p> <p>The proposed action is unlikely to result in invasive species that are harmful becoming established in potential habitat of the Gang-gang Cockatoo or Alpine She-oak Skink. Species such as cats or foxes are already present in the landscape and are subject to control programs within the resort.</p> <p>h. introduce disease that may cause the species to decline</p> <p>The proposed action is unlikely to introduce disease that may cause the Gang-gang Cockatoo or Alpine She-oak Skink to decline.</p> <p>i. interfere substantially with the recovery of the species.</p> <p>As the proposed action is not considered to decrease or fragment any existing populations the recovery of the Gang-gang Cockatoo and Alpine She-oak Skink are unlikely to be adversely impacted.</p>
(d) any impact on Commonwealth Listed Vulnerable Species;	<p>Yes. The study area provides potential habitat for one Commonwealth listed vulnerable species: the Broad-toothed Rat.</p> <p>The significant impact criteria in terms of the vulnerable species are discussed below:</p> <p><i>a. lead to a long-term decrease in the size of an important population of a species.</i></p>

Matters to be addressed	Impact
	<p>Whilst the proposed action will affect some potential habitat for the Broad-toothed Rat, it will affect only a very small amount of marginal potential habitat for the species. As such, the proposal is considered highly unlikely to adversely affect a significant proportion of the home range of one or more Broad-toothed Rat individuals and will not result in habitat fragmentation which could isolate individuals or a population of the Broad-toothed Rat.</p> <p>The noise and vibration associated with the proposal is likely to temporarily deter any Broad-toothed Rat individuals that may be near the affected areas. As such, it is unlikely that any individuals would be unintentionally killed during the implementation of the proposed action.</p> <p>Under these circumstances the proposed action will not lead to a long-term decrease in the size of an important population of the Broad-toothed Rat.</p> <p><i>b. reduce the area of occupancy of an important population</i></p> <p>It is highly likely that the Broad-toothed Rat will continue to occur within the study area after the implementation of the proposed action. The species continues to be locally common in the Thredbo Resort Area where there have been many similar and larger developments over many decades. As such, the proposed action is highly unlikely to reduce the area of occupancy of the Broad-toothed Rat.</p> <p><i>c. fragment an existing important population into two or more populations</i></p> <p>The proposed action will not fragment an existing important population of the Broad-toothed Rat into two or more populations.</p> <p><i>d. adversely affect habitat critical to the survival of a species</i></p> <p>No habitat within the study area is considered to be critical to the survival of the Broad-toothed Rat.</p> <p><i>e. disrupt the breeding cycle of an important population</i></p> <p>The proposed action and affected area is too small to disrupt the breeding cycle of a population of the Broad-toothed Rat.</p> <p><i>f. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline</i></p> <p>The proposed action will not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the Broad-toothed Rat is likely to decline.</p> <p><i>g. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat</i></p> <p>The proposed action will not result in invasive species that are harmful becoming established in habitat for the Broad-toothed Rat.</p> <p><i>h. interferes substantially with the recovery of the species.</i></p> <p>Whilst there have been documented declines in some Broad-toothed Rat populations within the Snowy Mountains, these declines have been attributed to environmental factors such as major bushfire events and early snow thaws, and not impacts of the nature of those proposed. In any case, the local population of the Broad-toothed Rat appears to continue to be relatively large on the basis of the abundance of the species scat throughout the Thredbo Resort Area. The species continues to occur in suitable habitats within the Thredbo Resort Area, including within the village. As such, it is considered highly unlikely that proposed action will substantially interfere with the recovery of the Broad-toothed Rat.</p>
(e) Any impact on a Commonwealth	No. The proposal will not impact any Commonwealth listed endangered ecological communities.

Matters to be addressed	Impact
Endangered Ecological Community	
(f) any environmental impact on Commonwealth Listed Migratory Species;	No. The proposal will not have any adverse impacts on any listed migratory species.
(g) does any part of the Proposal involve a Nuclear Action;	No. The project does not include a Nuclear Action.
(h) any environmental impact on a Commonwealth Marine Area;	No. There are no Commonwealth Marine Areas within the study area.
(i) In addition, any direct or indirect impact on Commonwealth lands	No. The project does not directly or indirectly affect Commonwealth land.

