

STATEMENT OF ENVIRONMENTAL EFFECTS

SECTION 44 MTB TRAIL THREDBO ALPINE RESORT KOSCIUSZKO NATIONAL PARK



Prepared for:
Kosciuszko Thredbo Pty Ltd



SEPTEMBER 2025
Project: 21-25

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SECTION 44 MTB TRAIL THREDBO ALPINE RESORT KOSCIUSZKO NATIONAL PARK

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This report has been prepared by:

A handwritten signature in black ink, appearing to read 'I. Pasalich', is written over a horizontal line.

Ivan Pasalich
Principal

SEPTEMBER 2025

Project: 21-25

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1. INTRODUCTION

1.1 Executive Summary

Dabyne Planning Pty Ltd has been engaged by Kosciuszko Thredbo Pty Ltd (KT), the head lessee of the Thredbo Alpine Resort to prepare a Statement of Environmental Effects (SEE) to accompany a Development Application (DA) to the NSW Department of Planning, Housing and Infrastructure (DPHI).

The DA is for undertaking a new mountain bike trail called the Section 44 trail, a technical/intermediate to advanced jump trail focusing on highspeed technical sections while incorporating jumps built into the natural terrain.

The trail will branch off the Flow Trail below the Woody's Trail turnoff and above the Flow Trail jump park section and re-join the lower section of the Flow Trail above the cross-over structure. The first section of trail will be located within Subalpine Woodland vegetation and comprise of a combination of long turns and technical straight sections that will have more of a natural construction and hand cut feel, with a narrower trail tread. The second part of the trail will use the existing disturbed Section 44 access trail and ski run, accessed from Lower Golf Course ski run and will incorporate large tabletops, hip jumps, berms and the natural features available with a wider trail tread.

The new trail is 1015m in length and has been designed to diversify the trail network offering guests an intermediate/advanced jump trail and introduce an exciting new style of trail that can be used by riders with multiple ability levels.

To determine an appropriate alignment for the mountain bike trail, KT identified an appropriate alignment with Dabyne Planning and Eco Logical Australia engaged early in the preliminary analysis process, which comprised of scoping fieldwork following on foot the proposed trail alignments and identifying any potential constraints.

In response to the two adjacent intermittent watercourses and higher valued Subalpine Riparian Scrub vegetation associated with the drainage lines, the trail alignment has carefully been located to avoid these constraints, avoid installing bridges and also utilising a disturbed ski run and access corridor.

A separate inspection by National Parks and Wildlife Service (NPWS) and the Department of Planning, Housing and Infrastructure (DPHI) was undertaken as part of the preliminary assessment process.

Following the preliminary analysis work, a fauna and flora assessment was then undertaken of the proposed trail alignment.

The final trail alignment has therefore been subject to an operational, planning and environmental analysis.

The proposed trail is not located within mapped biodiversity value areas and therefore the clearing of native vegetation, estimated to be 0.18ha, will not trigger the Biodiversity Offsets Scheme (BOS) under the Biodiversity Conservation Act, 2016 (BC Act, 2016).

Accordingly, a fauna and flora assessment has been prepared. This assessment has concluded that it is unlikely that the proposal will have a significant effect on threatened species, populations or ecological communities or their habitats and that the proposal is also 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 necessary.

Environmental impacts will be further mitigated through the implementation of a Site Environmental Management Plan (SEMP).

This SEE has concluded that following an extensive design and environmental assessment process, the proposed development can further enhance Thredbo as the leader of Australia's gravity-based mountain bike resorts, whilst minimising impacts on the environment.

A detailed description of the proposal is provided in Section 3 of the report.

The purpose of this SEE is to:

- describe the land to which the DA relates.
- describe the form of the proposed works.
- define the statutory planning framework within which the DA is to be assessed and determined; and
- assess the proposed development against the matters for consideration listed under Section 4.15(1) of the Environmental Planning and Assessment Act, 1979 (EP&A Act, 1979).

This includes documenting the environmental impacts of development; how the environmental impacts of the development have been identified; and the steps to be taken to protect the environment or to lessen the expected harm to the environment.

The report has been prepared in accordance with the requirements of the Environmental Planning and Assessment Regulations 2021.

2. THE LOCALITY AND SITE

2.1 The Locality

The subject site is located within the Thredbo Alpine Resort, approximately 35kms from Jindabyne. Access to the resort is achieved via the Alpine Way.

The location of Thredbo is illustrated in context with the regional locality below:

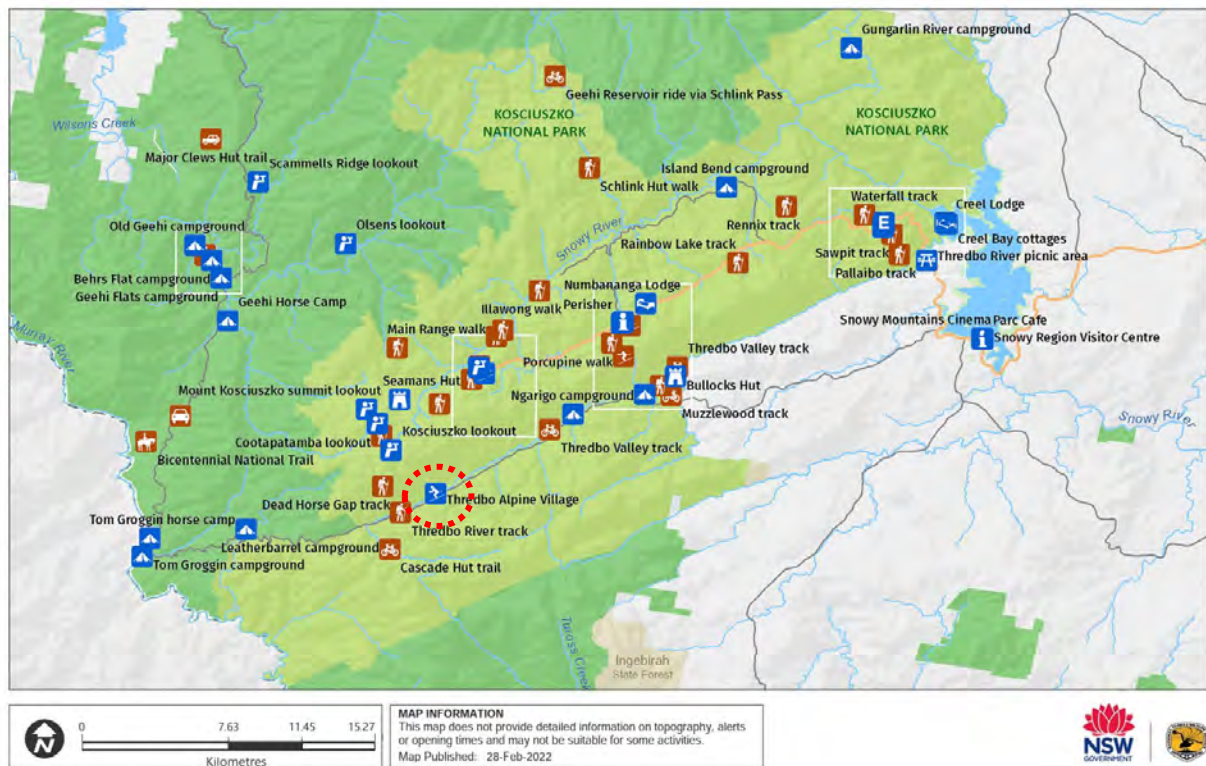


Figure 1: Context of the site within the region

2.2 The Site

The proposed Section 44 Trail is 1015m in length and provides for an alternative trail choice off the Flow Trail above the jump park, re-joining the lower Flow Trail.

The location of trail is illustrated in figure 2 below.



Figure 2: Location of the subject works

The proposed trail is located within the vegetation to the south of the Flow Trail, heading in a southerly direction, then turning to the east, following the existing Lower Golf Course ski run and access road, to the north of the Crackenback Ridge estate.

The proposed trail has been carefully designed in response to two watercourses, both 1st order streams, upper tributaries to the Thredbo River, as illustrated in figure 3.



Figure 3: Mapped 1st order intermittent watercourse in relation to the subject site

An extract of the Thredbo Mountain Bike Park Map and the location of the trail is provided below in figure 4.

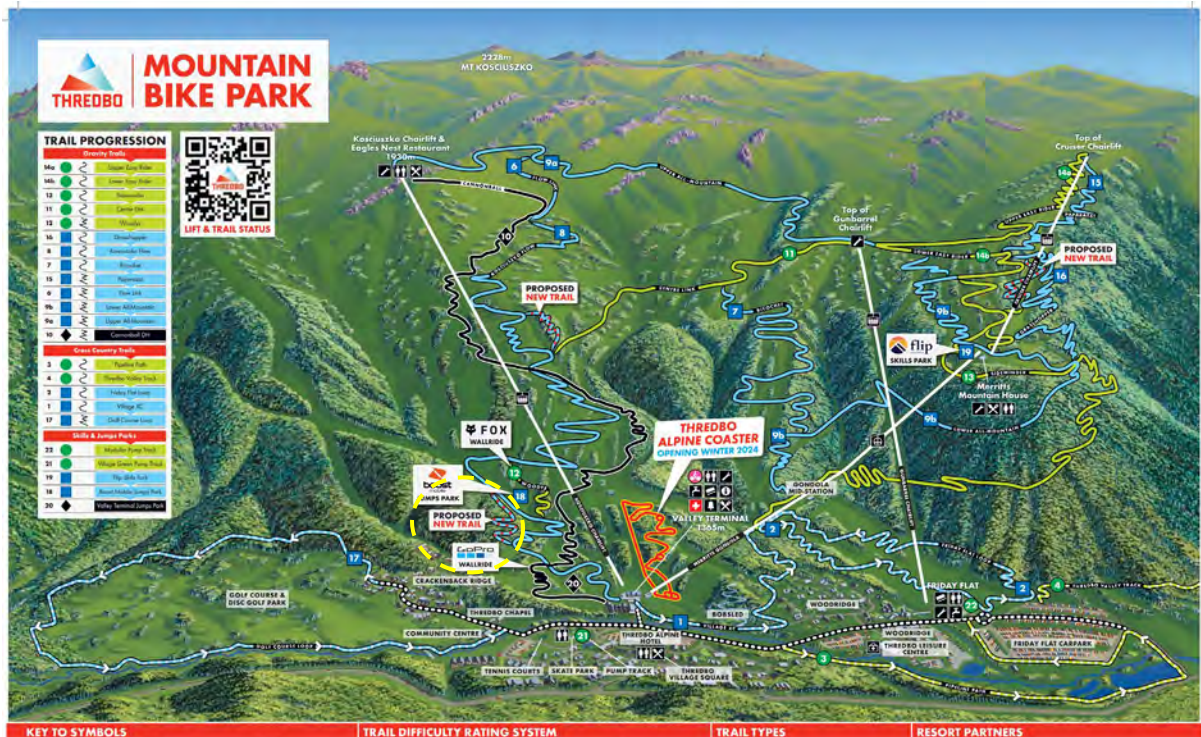


Figure 4: Location of the trail (yellow circle) in context with the Thredbo Mountain Bike Park Map

3. SITE ANALYSIS PROCESS

3.1 Introduction

The final trail alignment of the Section 44 trail has been subject to an operational, planning and environmental analysis.

This process has been documented below to demonstrate how potential environmental; construction and operational impacts associated with the original trail location and alignments have been mitigated, whilst ensuring that the overall trail objectives would not be compromised, and the design principles identified below would be upheld.

3.2 Trail Design Principles

The original key design principles, developed for the recently constructed mountain bike trails have been further refined and applied to the design and siting of the Section 44 trail, as summarised below.

Key Design Principles:

To minimise environmental impacts, including erosion and achieve the optimal trail outcome and guest experience, the following principles developed by IMBA will be incorporated into the trail design and construction and include the 'rolling contours concept', 'outslope', 'the half rule', 'the 10% average guideline' and the use of 'frequent grade reversals. These are explained in more detail with illustrative examples provided below:

The Rolling Contours Concept:



Figure 5. Example shows the trail following the contour of the slope, rather than down the fall line

'The trail should be built on a side slope, aligned along the contours of the hillside, with the lowest gradient possible and with frequent undulations. Trails built in this style, roll or surf along the contours, hence the name 'rolling contours'.

Outslope:

Figure 6. Example shows the outslope of the trail to shed water



'The trail should be outsloped. That is, it should slope gently (no more than 5%) down towards the lower, outside edge of the trail. This allows water flowing down the hillside to shed across the trail, rather than being channelled along the trail. It should not be too steeply outsloped, as this can create an uncomfortable feeling for users'.

The Half Rule:

Figure 7. Example shows an existing fire trail at Mill Creek Jindabyne that was previously used and is steep and follows the fall line, greater than 10%, with the new trail in the background which has followed the half rule



'The Half Rule states that the trail gradient shouldn't exceed half of the gradient of the hillside along which the trail traverses. If the trail gradient does exceed half the side slope gradient, it is considered a fall-line trail. Instead of shedding across the trail, water will run along the trail, displacing soil and causing erosion. For example, if the gradient of the side slope is 20%, the maximum allowable trail gradient would be 10%'.

The 10% Average Guideline:



Figure 8. Example shows the use of switchbacks to achieve a 10% average gradient even on steeper slopes

'The 10% Average Guideline was first coined by IMBA and states that, generally, an average trail grade of ten percent or less is the most sustainable.

Trails with average gradients in excess of this are more likely to become eroded. This is a general guideline – exceptions to the rule can be sustainable, and depend on factors like local soils, geology, climate etc'.

Frequent Grade Reversals

Figure 9. Example shows how the trail uses a dip before proceeding uphill, to allow for drainage (this one includes rock armouring)



'Grade reversals are 'dips' and 'crests' on a trail. They are the point at which the trail gradient reverses or changes from down to up (or up to down depending on the direction of travel). Grade reversals are essential for sustainability as they create barriers to prevent water from flowing along the trail, where the 'dip' becomes a drainage outlet for water. They also help to give a trail a dynamic feel and are a fundamental component that helps to set mountain biking trails apart from walking tracks and roads'.

3.3 Preliminary Site Assessment

The proposed Section 44 Trail was subject to a preliminary site analysis to determine the appropriate location for the trail.

The trail was identified by KT with Dabyne Planning and Eco Logical Australia engaged early in the preliminary analysis process, which comprised of scoping fieldwork following on foot the new trail proposed and identifying any potential constraints.

This included a separate inspection by NPWS and DPHI as part of the preliminary assessment process.

The proposed trail has been designed and located to minimise impacts on two 1st order watercourses which form upper tributaries to the Thredbo River.

As these watercourses were incorrectly mapped, KT undertook additional fieldwork and LIDAR mapping to verify their respective locations to ensure the new trail can be designed to avoid their respective vegetation riparian zones [VRZ].

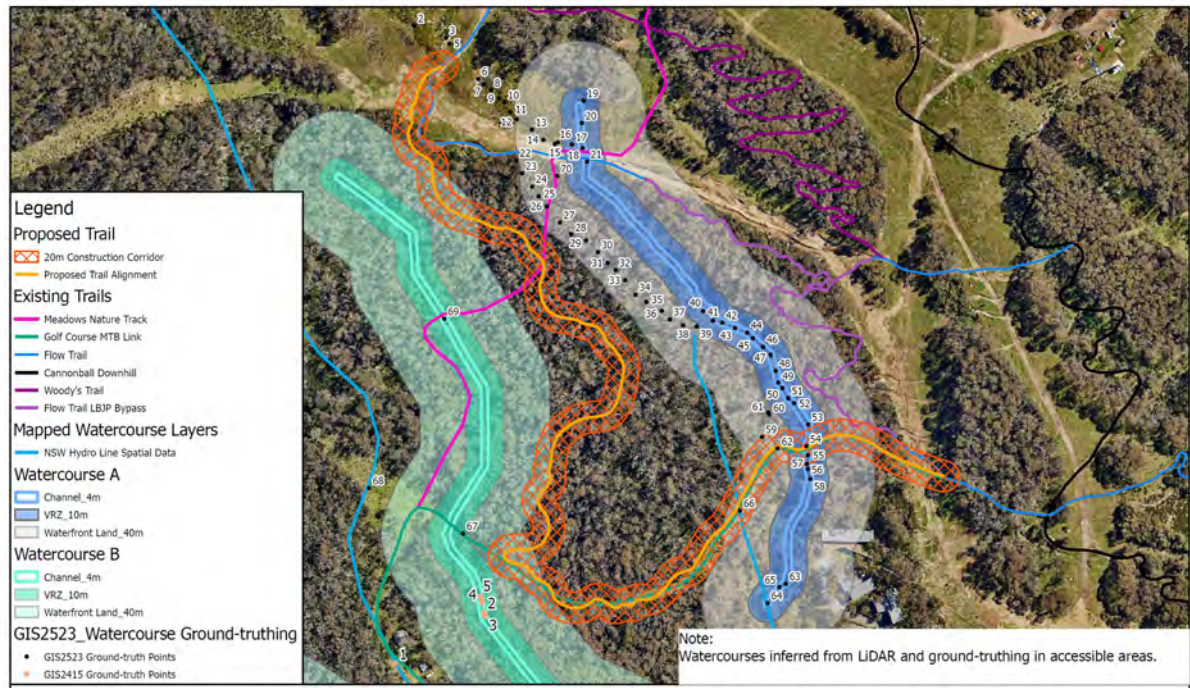


Figure 10: Proposed trail in relation to the verified watercourses and their respective vegetation riparian zones

By designing and locating the trail outside each watercourse VRZ, the associated Subalpine Riparian Scrub is also avoided, minimising impacts on this higher valued vegetation.

This also alleviates the need to construct bridges or platforms over any of the watercourses, with the trail using the ski run and access track culverts to cross watercourse A.

4. PROJECT DESCRIPTION

4.1 Project Components

Enchanted Forest Trail (MTB) - Summary:

Trail Length:	1015m
Type of Trail:	Technical/Jump Trail
Proposed Difficulty Rating:	Intermediate/Advanced
Proposed Surface:	Natural Surface
Trail Tread (width):	Technical (Forest): 1.5m Jump (Ski Run): 3m
Trail Corridor:	Technical (Forest): 4m (maximum) Jump (Ski Run): 4m (maximum)
Approximate total area of initial disturbance to native vegetation	0.18ha (see FFA)

Trail Description:

The proposed Section 44 trail is a technical/ intermediate to advanced jump trail focusing on highspeed technical sections while incorporating jumps built into the natural terrain.

The trail will branch off the Flow Trail below the Woody's Trail turnoff and above the Flow Trail jump park section and re-join the lower section of the Flow Trail above the cross-over structure. The first section of trail will be located within Subalpine Woodland vegetation and comprise of a combination of long turns and technical straight sections that will have more of a natural construction and hand cut feel, with a narrower trail tread. The second part of the trail will use the existing disturbed Section 44 access trail and ski run, accessed from Lower Golf Course ski run and will incorporate large tabletops, hip jumps, berms and the natural features available with a wider trail tread.

The new trail is 1015m in length and has been designed to diversify the trail network offering guests an intermediate/advanced jump trail and introduce an exciting new style of trail that can be used by riders with multiple ability levels.

A site overview of the proposal trail in relation to the existing and approved trail network, including existing Meadows Nature walking track is provided in figure 11 below.

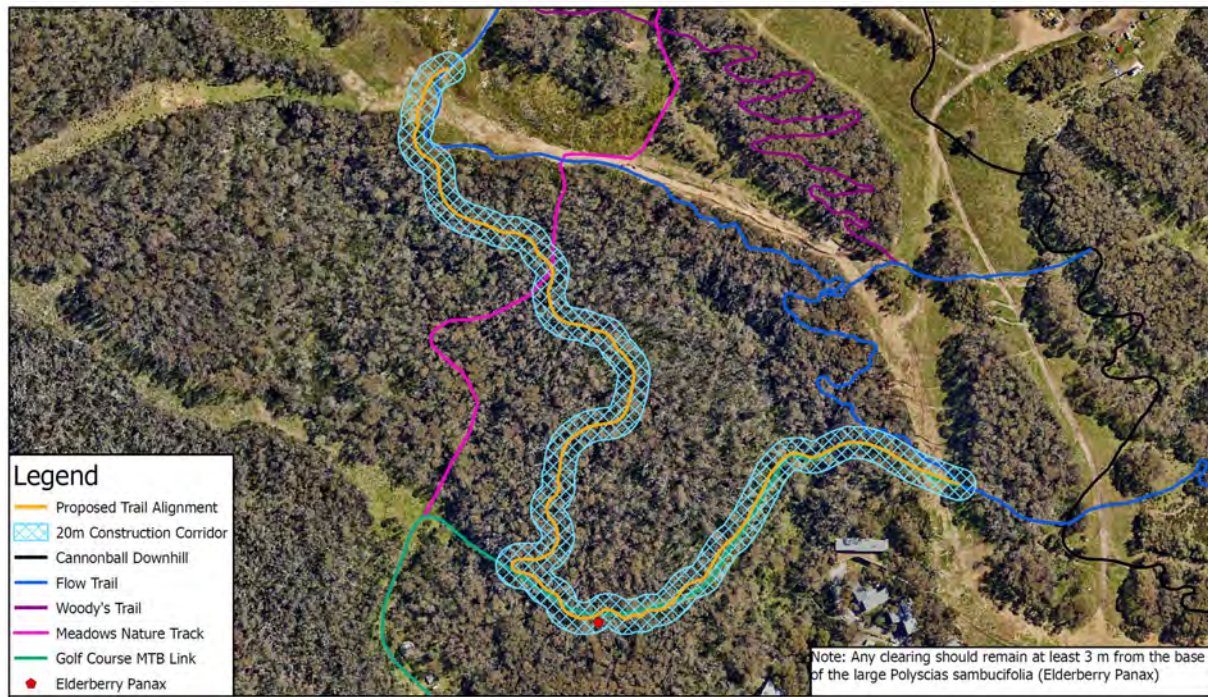


Figure 11: Site overview of the proposed trail in context with the trail network

The trail commences where it departs the Flow Trail, heading south into the Subalpine Woodland vegetation.



Figure 12: Trail departs the Flow Trail and enters the Subalpine Woodland vegetation

The proposed trail heads in a southerly direction, carefully located between two watercourses, following the elevated landform and drier Subalpine Woodland vegetation in a south-east direction.



Figure 13: Trail traverses the elevated landform and Subalpine Woodland vegetation

The trail then crosses the Meadows nature walking trail.



Figure 14: Trail crosses the Meadow Nature walking track

The trail then heads more southerly towards the Lower Golf Course ski run and access road, where it uses this disturbed corridor and existing culverts to avoid constructing new bridges.



Figure 15: Trail follows the existing disturbed ski run and access corridor and utilises its existing culverts

The proposed trail is located on both the lower and upper edges of this disturbed corridor, to avoid obstructing access vehicles in summer and skiers and snowboarders in winter.

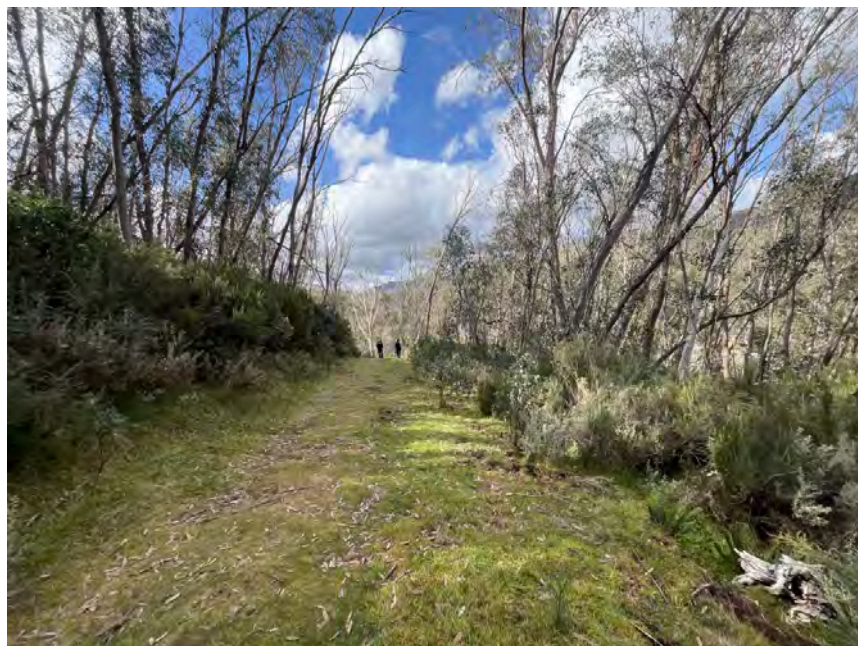


Figure 16: Trail has been designed to be located on both the high and low side of the ski run and access corridor to avoid obstruction

The trail will also be separated from the existing Golf Course MTB link trail.

The trail re-joins the existing Flow Trail on the Supertrail ski run, before the cross-over structure with the Cannonball Trail.

Trail Signage:

As part of the new trail, trail signage is also proposed in form of Waymarkers and a Decision Point sign.

Waymarkers:

Waymarkers usually comprise of a simple bollard or post (generally 100mm x 100mm x 1.2m tall) with symbols on it to guide trail users in the correct direction at any point of uncertainty where it may not be entirely clear where the trail goes.

Waymarkers should be used:

- Where a mountain bike trail crosses a road or four-wheel drive track – there is no need to signpost the name of the road or four-wheel drive track because it is not intended for use by mountain bikers, but there is a need to provide direction and reassurance for mountain bikers at this point to ensure they follow the mountain biking trail.
- Where there have been no signs for a substantial distance – if there have been no intersections or signs for, say, 2km, it might be prudent to place a waymarker beside the trail with a 'straight ahead' arrow, just to reassure riders they are still on the correct trail.
- Where a new trail branches off from another trail – the new trail should have a Decision Point Sign, but the current, continuing trail should have a waymarker to advise the rider that the trail they have been using continues as well.
- Waymarkers can also be used to signify the wrong direction of travel, by using an 'X'. For example, where a cross-country trail crosses over a downhill trail, or merges with a flow track, it may be wise to place Waymarkers suitably with 'X' symbols to discourage riders from going the wrong way. It is also good practice to place 'X' symbols on the backs of any Waymarkers, just as extra advice to riders that may travel in the wrong direction.

On this basis, the trail will require approximately four (4) Waymarkers across the proposed trail.

An example of a Waymarker already erected within the resort is provided in figure 17 below.



Figure 17: Example of a Waymarker at Thredbo

Decision point signs

Decision point signs generally comprise posts with information in relation to important departure and destination locations along the trail. Signs are generally 400 x 200 mm, on a 500 mm round post, 1,800 mm high. The signs generally include the following information:

- trail name
- arrow indicating direction of trail
- trail number (reference to trail network map)
- difficulty symbol e.g. blue for intermediate



Figure 18: Example of the Decision point sign content

4.2 General Construction

4.2.1 MTB Trail Construction

The trail path is referred to as the tread. The width of the tread will vary depending on the intended user group, the type of trail being constructed and the intended degree of difficulty.

As the proposed Section 44 trail is proposed to be an intermediate to advanced technical/jump mountain bike trail, the first part of the trail located within the Subalpine Woodland vegetation will comprise of a combination of long turns and technical straight sections that will have more of a natural construction and hand cut feel, with a narrower trail tread. This trail tread is proposed to be 1.5m wide.

The second part of the trail will use the existing disturbed Section 44 access trail and ski run, accessed from Lower Golf Course ski run and will incorporate large tabletops, hip jumps, berms and the natural features available with a wider trail tread. This trail tread is wider at 3m.

This achieves the requirements of the IMBA standards (trail difficulty guideline, provided in figure 19 below).

	Very easy  White Circle	Easy  Green Circle	Intermediate  Blue Square	Difficult  Single Black Diamond	Extreme  Double Black Diamond
Description	Likely to be a fire road or wide single track with a gentle gradient, smooth surface and free of obstacles. Frequent encounters are likely with other cyclists, walkers, runners and horse riders.	Likely to be a combination of fire road or wide single track with a gentle gradient, smooth surface and relatively free of obstacles. Short sections may exceed these criteria. Frequent encounters are likely with other cyclists, walkers, runners and horse riders.	Likely to be a single trail with moderate gradients, variable surface and obstacles. Dual use or preferred use Optional lines desirable	Likely to be a challenging single trail with steep gradients, variable surface and many obstacles. Single use and direction Optional lines XC, DH or trials	Extremely difficult trails will incorporate very steep gradients, highly variable surface and unavoidable, severe obstacles. Single use and direction Optional lines XC, DH or trials
Trail Width	2100mm plus or minus 900mm	900mm plus or minus 300mm for tread or bridges.	800mm plus or minus 300mm for tread or bridges.	300mm plus or minus 150mm for tread and bridges. Structures can vary.	150mm plus or minus 100mm for tread or bridges. Structures can vary.
Trail Surface	Hardened or smooth.	Mostly firm and stable.	Possible sections of rocky or loose tread.	Variable and challenging.	Widely variable and unpredictable.
Average Trail Grade	Climbs and descents are mostly shallow. Less than 5% average.	Climbs and descents are mostly shallow, but may include some moderately steep sections. 7% or less average.	Mostly moderate gradients but may include steep sections. 10% or less average.	Contains steeper descents or climbs. 20% or less average.	Expect prolonged steep, loose and rocky descents or climbs. 20% or greater average
Maximum Trail Grade	Max 10%	Max 15%	Max 20% or greater	Max 20% or greater	Max 40% or greater
Level of Trail Exposure	Firm and level fall zone to either side of trail corridor	Exposure to either side of trail corridor includes downward slopes of up to 10%	Exposure to either side of trail corridor includes downward slopes of up to 20%	Exposure to either side of trail corridor includes steep downward slopes or freefall	Exposure to either side of trail corridor includes steep downward slopes or freefall

Figure 19: IMBA Trail Difficulty Rating System (Source: IMBA)

The trail corridor

The trail corridor is usually wider than the trail tread width, depending on the slope and type of trail constructed. The greater the slope, the wider the corridor due to the extent of the upper and lower batters, as illustrated in figure 20 below.

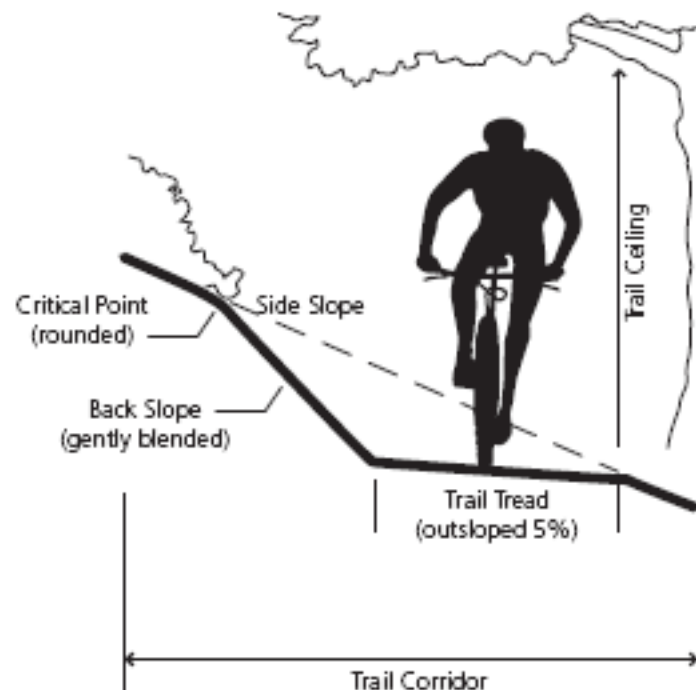


Figure 21: Trail corridor diagram (Source: IMBA)

A maximum 4m wide trail corridor has been used for assessment purposes for the entire trail.

Flexibility in locating the trail corridor

Approval to construct the proposed trails is within a 20m wide corridor (10m either side of the ground-truthed alignment), which is narrow by industry standards (i.e., the Lower TVT was approved with a 50m corridor, although it required the removal of over 36,000m² of an Endangered Ecological Community).

A 20m wide corridor is required to provide flexibility for the trail builders to respond to any unforeseen circumstances that may occur. For example, prior to construction, it may appear that the soil is deep, and excavation will be easy, but once construction commences, it soon becomes apparent that there is a large slab of rock just beneath the surface.

This is generally a sound principle and is consistent with the trail design and construction process adopted with other trails.

This is particularly useful in areas of disturbed ski slopes or areas of common vegetation communities that are not listed as Endangered Ecological Communities or accommodate known Threatened Species.

Therefore, this principle will be applied to the proposed trail.

Trails on sloping ground

Trails built on sloping ground will require some form of excavation to achieve a full or partial bench construction, as shown in figure 22 below. Full bench tread involves excavating down and into the hillside and puts the entire tread width on mineral soil, thereby maximising stability and minimising ongoing maintenance.

Partial bench tread involves using some of the excavated soil to construct the downhill side of the tread. This technique is prone to slipping and is not recommended, except in specific circumstances when done in conjunction with a retaining wall.

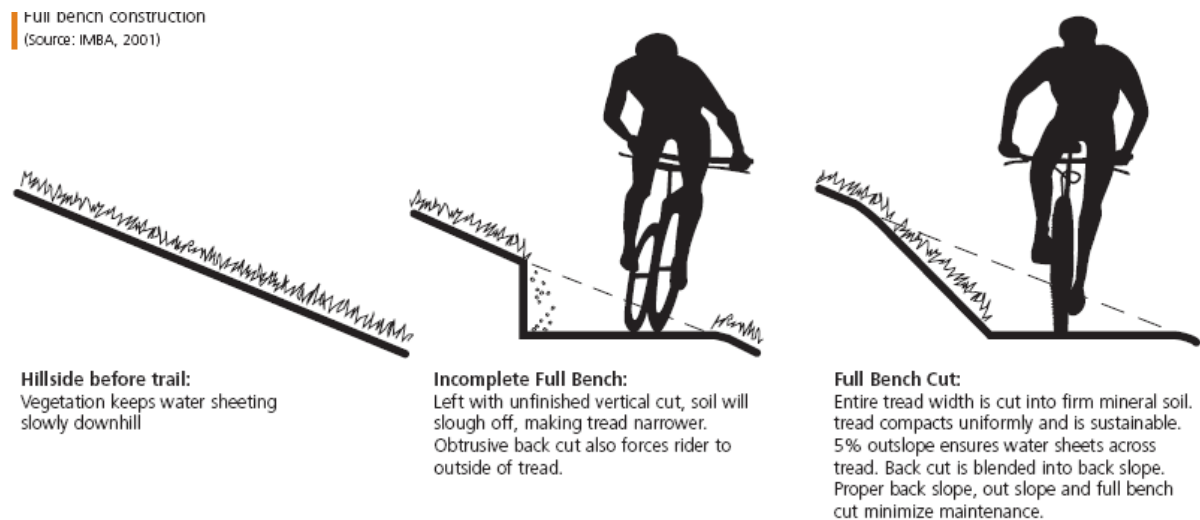


Figure 22: Full Bench Construction (Source: IMBA)

The trail surface

The proposed trail surface will be predominantly natural soil, with local crushed granodiorite used where required.

Surface water control

As part of achieving sustainable trails, diverting surface water is a high priority as running water will erode the trail and support structures and cause loss of sedimentation while standing water can result in wet boggy conditions.

As outlined in Section 3.2 of the SEE above, constructing the trail following the design principles including the rolling contours concept and outsloping the trail goes a long way in managing surface water. Other treatments include using frequent grade reversals, which incorporate grade or drain dips.



Figure 23: Example of a drain dip, rock hardened on the All-Mountain Trail

Rock Armouring

Rock armouring as shown in the example below in figure 24 is used to harden trails to create an elevated trail tread above wet or soft terrain and to harden the trail tread against user caused erosion.



Figure 24: Example of rock armouring on the Sidewinder Trail

4.2.2 Construction Sequence

KT has previously identified and used the following construction sequence for the construction of the trails:

1. Re-flag the trail; as the flagging tape used for the ground-truthing process may become untied or faded (or removed through snow), the trail corridor is to be re-flagged where required.
2. Mark out the exact trail alignment; the exact trail alignment is to be marked out using pin flags to mark the edges of the trail. The pin flags are places on the ground by the trail designer to mark the edges of the trail to be constructed.
3. Clear the trail corridor of vegetation; the next step is to clear the trail corridor of vegetation. The trail is to be aligned to avoid the need to fell large or mature trees (e.g., larger than 200mm in diameter). The goal in this step is to clear the trail corridor back to bare earth, ready for construction and therefore this should be undertaken in 50m sections at a time to reduce the amount of soil exposed. Surplus cut vegetation is to be spread into the surrounding heath and used to rehabilitate the exposed soil on the edges of the new trail, rather than import and use hay.
4. Cut the bench; using a mini excavator the slope is cut into and the soil excavated to achieve the appropriate depth. This will be undertaken following the pin flags laid out in the previous step. Any topsoil removed, along the vegetation sods are to be stockpiled close to the track.
5. Clean up the trail tread; the trail tread is then to be cleaned up by removing loose rocks, roots, compacting, back sloping the batter, ensuring outslope and drainage and placing rocks, logs and other obstacles as necessary to define the main riding line. Re-instate the verge areas topsoil and preserved vegetation sods and use the cut heath as a mulch for stabilisation and re-growth.

4.2.3 Construction Timing, Site Compound and Stockpile Site

Construction for the proposed trail is scheduled to commence during the summer of 2025/26.

Details on construction work areas, site compound and stockpile sites are provided in the SEMP separately.

5. KEY MATTERS FOR CONSIDERATION

5.1 Fauna and Flora

The proposed trail has been designed to avoid the biodiversity value mapped areas under the Biodiversity Conservation Act 2016.

The proposal trail has also been designed and located to avoid the vegetation riparian zones associated with the two adjacent watercourses and therefore avoids the higher valued Subalpine Riparian Scrub vegetation.

The trail type and construction has been deliberately designed as a technical trail [that will have more of a natural construction and hand cut feel] within the Subalpine Woodland vegetation, therefore requiring a narrower trail tread, before it utilises the existing ski run and access road corridor, where the trail design and its construction changes to a jump trail requiring a wider trail tread.

The proposal will result in 0.18ha of disturbance of common Subalpine Woodland vegetation.

As the trail does not comprise of permanent structures such as road base, concrete or buildings, the trail could be rehabilitated in the future should it be closed or become redundant. Former trails that have been closed demonstrate that they are claimed back by native vegetation cover, close to 100% to their original condition.

The impacts associated with the proposed trail has been assessed by Ryan Smithers, Principal Ecologist, Eco Logical Australia with the correspondence provided in Appendix A.

This assessment has identified that the 'proposal will not affect any potentially important habitats for threatened fauna species. , and has been designed to avoid potentially important habitats such as the nearby Subalpine Riparian Scrub Forest. The proposal will not sever any linkages between habitats or otherwise permanently restrict fauna movement'.

The assessment concluded that it is unlikely that the proposal will have a significant effect on threatened species, populations or ecological communities or their habitats and that the proposal is also 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 necessary.

5.2 Aboriginal Cultural Heritage

An 'Aboriginal Cultural Due Diligence Assessment' has been undertaken by Past Traces Heritage Consultants, which included an on-site field survey and background research.

The assessment was undertaken following the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales [DECCW 2010a]*. The Due Diligence process was followed to ensure compliance with the code.

This process included an extensive search of the AHIMS database covering the surrounding area centred on the project area, a review of previous studies and a field survey.

As a result of the field survey and background research, the development proposal should be able to proceed with no additional archaeological investigations. No areas of potential archaeological deposits or heritage sites have been identified within the development area and the potential for Aboriginal or historical heritage objects within the development area has been assessed as low.

A copy of the full report is provided in Appendix B.

6. ENVIRONMENTAL AND PLANNING LEGISLATION

6.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

6.1.1 SECTION 4.15(1)(a)(i) – ENVIRONMENTAL PLANNING INSTRUMENTS

The State Environmental Planning Policy (Precincts – Regional) 2021 (SEPP Regional Precincts) applies to the subject site and proposed development.

Chapter 4 – Kosciuszko Alpine Region of the SEPP Regional Precincts has been addressed below.

Section 4.1 Aim and objectives of Chapter:

Matter for Consideration	Response
The aim of this Chapter is to protect and enhance the Alpine Region by ensuring development managed with regard to the principles of ecologically sustainable development, including the conservation and restoration of ecological processes, natural systems and biodiversity.	
(2) The objectives of this Chapter are as follows—	
(a) to encourage the carrying out of a range of development to support sustainable tourism in the Alpine Region all year round, if the development does not result in adverse environmental, social or economic impacts on the natural or cultural environment of the Alpine Region, including cumulative impacts on the environment from development and resource use,	<i>The proposal is to provide a mountain bike trail that has been designed to minimise environmental impacts whilst providing positive social and economic impacts.</i> <i>The SEPP does not provide any framework for consideration of cumulative impacts.</i>
(b) to establish planning controls that— (i) contribute to and facilitate the carrying out of ecologically sustainable development in the Alpine Region, and (ii) recognise the Alpine Region's significant contribution to recreation and the tourism economy in the State,	<i>The objective relates to establishing planning controls and therefore is not relevant to the assessment of the proposed development.</i>

(c) to minimise the risk to the community exposure to environmental hazards, particularly geotechnical hazards, bush fires and flooding, by— (i) generally requiring development consent on land in the Alpine Region, and (ii) establishing planning controls for buildings ensure the safety of persons using the buildings if there is a fire.	<i>The objective sets out to minimise risk to the community in relation to environmental hazards, such as geotechnical hazards, bush fires and flooding by requiring development consent.</i> <i>A DA has been lodged and the development requires consent.</i> <i>The second part of the objective relates to establishing planning controls for buildings to ensure the safety of persons using the buildings if there is a fire. This is not an environmental hazard, and the proposal does not relate to buildings.</i>
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Section 4.2 Land to which Chapter applies:

The subject site is located within the Thredbo Alpine Resort and this subregion is mapped as shown in the extract below.

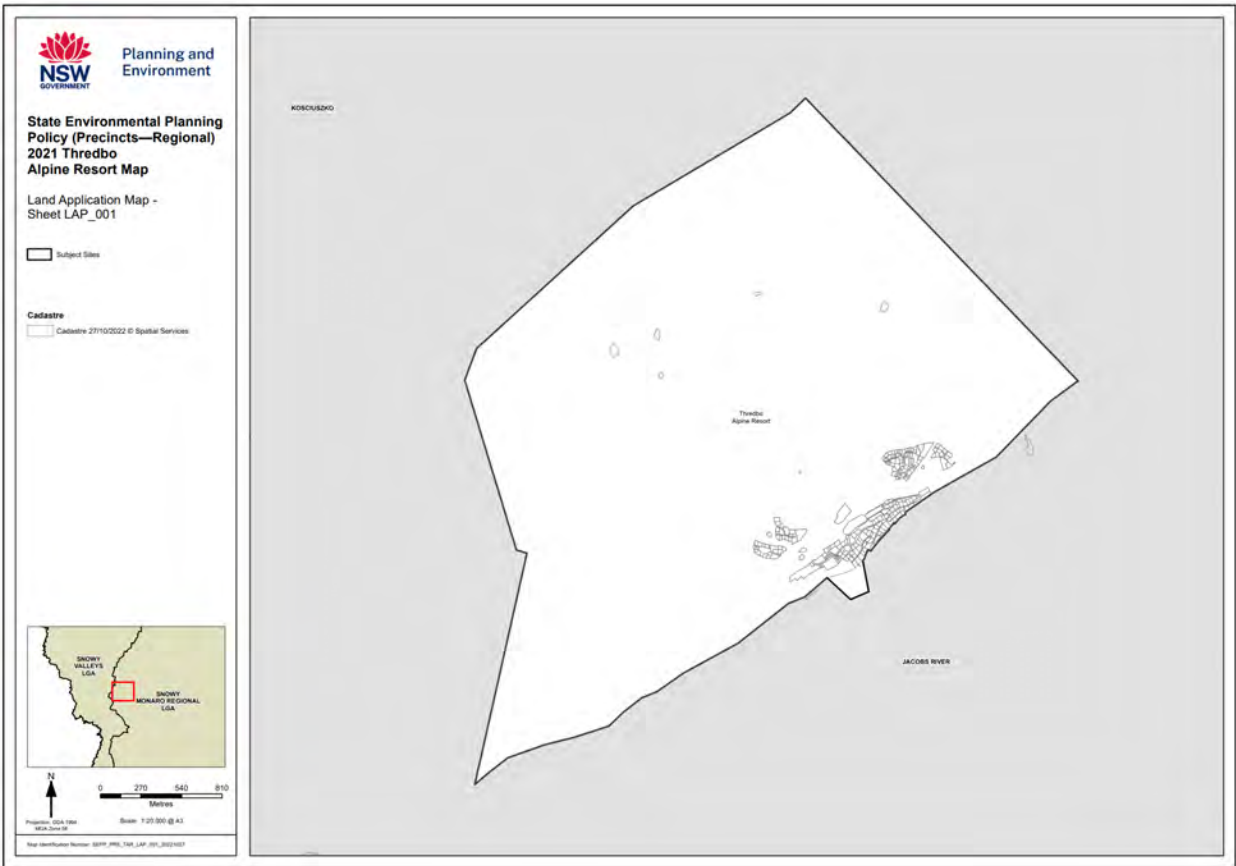


Figure 25: Precincts-Regional SEPP - Thredbo Alpine Resort Sub-Region Map

Section 4.7 - Land Use Table:

The land use table for Thredbo Alpine Resort specifies that ‘recreation infrastructure’ is permitted with consent. Accordingly, the proposal is permitted with consent.

Section 4.19 Public utility infrastructure

The proposed trails do not require the provision of public utility infrastructure.

Section 4.24 Flood Planning

Under Section 4.24(2), Development consent must not be granted to development on land in the Alpine Region the consent authority considers to be in the flood planning area unless the consent authority is satisfied with the provisions listed under (a) to (e) with further matters for consideration listed under S.4.23(3).

Under S.4.24(4) the words used in this section have the same meaning as in the *Considering Flooding in Land Use Planning Guideline*, published on the Department's website on 14 July 2021, unless otherwise defined.

In accordance with these guidelines, 'flood planning area has the same meaning as in the *Floodplain Development Manual*, ISBN 0 7347 5476 0, published by the NSW Government in April 2005'.

The Floodplain Development Manual defines flood planning area as 'the area of land below the FPL, and thus subject to flood related development controls. The concept of flood planning area generally supersedes the "flood liable land" concept in the 1986 Manual'.

Under the SEPP, there is no defined flood planning area or FPL and no reference to any adopted mapping.

Further consideration of Section 4.24 therefore cannot be undertaken.

Section 4.25 Earthworks

Matter for Consideration	Response
(3) In deciding whether to grant development consent for earthworks, or for development involving ancillary earthworks, the consent authority must consider the following matters—	
(a) the likely disruption of, or adverse impact on, drainage patterns and soil stability in the locality of the development,	<i>The proposal includes ancillary earthworks involved with the construction of mountain bike trails.</i> <i>Construction of mountain bike trails across the mountain is a common development practice that has demonstrated to have little to no impact on drainage patterns or soil stability, with the trail designed to avoid watercourses and wet areas.</i>
(b) the effect of the development on the likely future use or redevelopment of the land,	<i>The effect of the development will have a negligible impact on the future use or redevelopment.</i>
(c) the quality of the fill or the soil to be excavated, or both,	<i>The quality of the soil is not likely to change, as it will be reused on site.</i>
(d) the effect of the development on the existing and likely amenity of adjoining properties,	<i>The development will have a negligible effect on the existing and likely amenity of adjoining properties, which predominantly comprise of ski slopes and mountain bike trails.</i>

(e) the source of any fill material and the destination of any excavated material,	<i>The proposed trail construction does not generally use fill material or require excavated material to be transported off-site.</i>
(f) the likelihood of disturbing relics,	<i>This is unlikely as discussed in Section 4.2 above.</i>
(g) the proximity to, and potential for adverse impacts on, a waterway, drinking water catchment or environmentally sensitive area,	<i>The proposed trail has been carefully designed and located to minimise impacts on a waterway.</i> <i>There are no defined water catchments or environmentally sensitive areas under the SEPP.</i>
(h) appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.	<i>The proposal has been carefully designed and located to minimise impacts on watercourses, wet areas and significant vegetation.</i> <i>Furthermore, these impacts can be minimised by way of implementation of the measures outlined in the Site Environmental Management Plan (SEMP).</i>

Section 4.26 Master plans

The Minister must prepare and approve a master that applies to the Alpine Region under Section 4.26 of the Chapter 4 of the SEPP Regional Precincts. On the 1 July 2022, the Snowy Mountains Special Activation Precinct Master Plan (SM SAP MP) was adopted. The SM SAP MP was adopted well in advance of the new Chapter 4 of the SEPP Regional Precincts and therefore prior to Section 4.46 being implemented.

The Master Plan must contain certain information.

The SM SAP MAP does not:

- Include a map showing existing and proposed types of development for the Thredbo Alpine Resort: No map of the entire resort, including the subject site is provided, therefore the Master Plan does not apply to the subject site. Furthermore, the map provided does not show 'existing and proposed types of development'. The map only shows 'development areas'.
- Include performance criteria for the proposed development.
- Include information about heritage items or places of heritage significance: The Master Plan does not provide information or a map of any heritage items.
- Outline limitations on development on certain land: The Master Plan does not show any limitation on development with regard to the subject site, being located on the upper ski slopes of the resort.

The Master Plan was drafted and finalised well before the new Chapter 4 of the SEPP Regional Precincts was gazetted.

Section 4.28 – Consideration of master plans and other documents

Matter for Consideration	Response
(1) In deciding whether to grant development consent to development in the Alpine Region, the consent authority must consider the following—	
(a) the aim and objectives of this Chapter set out in section 4.1,	<i>The proposed development is not inconsistent with the aim and relevant objectives.</i>
(b) [Repealed]	<i>Not applicable.</i>
(c) a conservation agreement under the Environment Protection and Biodiversity Conservation Act 1999 of the Commonwealth that applies to the land,	<i>Not applicable.</i>
(d) the <i>Geotechnical Policy –Kosciuszko Alpine Resorts</i> published by the Department in November 2003,	<i>The ‘Geotechnical Policy –Kosciuszko Alpine Resorts’ only applies to the land which State Environmental Planning Policy No.73 – Kosciuszko Ski Resorts (SEPP No. 73) applies, under clause 1.2(b).</i> <i>This SEPP has been repealed and no longer applies to the land.</i> <i>Notwithstanding this, the proposed trail does not require any structures or platforms to traverse watercourses and therefore only comprises of minor earthworks. A Form 4 is therefore not required.</i>
(e) for development in the Perisher Range Alpine Resort— (i) the Perisher Range Resorts Master Plan published by the National Parks and Wildlife Service in November 2001, and (ii) the Perisher Blue Ski Resort Ski Slope Master Plan adopted by the National Parks and Wildlife Service in May 2002.	<i>Not applicable.</i>
(2) In deciding whether to grant development consent to development in the Alpine Region, the consent authority must consider—	
(a) a master plan approved by the Minister under section 4.26 that applies to the land, or	<i>The SM SAP MP was adopted prior to the new Chapter 4 of the SEPP being adopted, therefore prior to section 4.26.</i> <i>The SM SAP MP does not specifically relate to the site or the proposed development and does not include the mandatory information required under section 4.26 of the SEPP.</i>
(b) if a master plan has not been approved—a draft master plan prepared under section 4.26 that is intended to apply to the land and has been published on the NSW planning portal.	<i>Not applicable.</i>

Section 4.29 - Consideration of environmental, geotechnical and other matters

Matter for Consideration	Response
S.4.29 (1) In deciding whether to grant development consent to development in the Alpine Region, the consent authority must consider the following—	
(a) measures proposed to address geotechnical issues relating to the development,	<i>The proposed trail does not require any structures or platforms to traverse watercourses and therefore only comprises of minor earthworks. A Form 4 is therefore not required and no measures are required to address geotechnical issues.</i>
(b) the extent to which the development will achieve an appropriate balance between— (i) the conservation of the natural environment, and (ii) taking measures to mitigate environmental hazards, including geotechnical hazards, bush fires and flooding,	<i>The proposal does not require any measures to mitigate environmental hazards that would impact on the conservation of the natural environment.</i>
(c) the visual impact of the proposed development, particularly when viewed from the land identified as the Main Range Management Unit in the Kosciuszko National Park Plan of Management	<i>The proposed works will result in a mountain bike trail in an area that is not visually prominent and mostly screened by existing vegetation.</i> <i>The proposed mountain bike trail is commonplace in the resort and will not create any additional visual impacts.</i>
(d) the cumulative impacts of development and resource use on the environment of the Alpine Subregion in which the development is carried out,	<i>There is no framework provided to assess cumulative impacts. That being said, an assessment of likely impacts of the proposal is provided in Section 6.1.6 of this SEE.</i>
(e) the capacity of existing infrastructure and services for transport to and within the Alpine Region to deal with additional usage generated by the development, including in peak periods,	<i>The proposed trail will have no impact on the existing transport to and within the resort, as the proposal does not generate additional usage.</i>
(f) the capacity of existing waste or resource management facilities to deal with additional waste generated by the development, including in peak periods.	<i>The proposed trail will generate minimal waste.</i>
(2) For development involving earthworks or stormwater draining works, the consent authority must also consider measures to mitigate adverse impacts associated with the works.	<i>Ancillary excavation works are required for the trail.</i> <i>Sedimentation and erosion control measures as outlined in the SEMP provided separately will mitigate any adverse impacts associated with such works.</i>

(3) For development the consent authority considers will significantly alter the character of an Alpine Subregion, the consent authority must also consider— (a) the existing character of the site and immediate surroundings, and (b) how the development will relate to the Alpine Subregion.	<i>The proposed trail will not significantly alter the character of the Thredbo Alpine Subregion.</i>
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Section 4.30 - Kosciuszko National Park Plan of Management

The proposed development is not inconsistent with the Kosciuszko National Park Plan of Management.

6.1.2 SECTION 4.15(1)(a)(ii) – DRAFT ENVIRONMENTAL PLANNING INSTRUMENTS

There are no draft Environmental Planning Instruments that are applicable to the site or proposed development.

6.1.3 SECTION 4.15(1)(a)(iii) – DEVELOPMENT CONTROL PLANS

The NSW Alpine Region Development Control Plan 2025 (ARDCP 2025) applies to the subject site, being located within the Thredbo Alpine Resort.

In accordance with Section 1.8 of the ARDCP 2025, a development application is required to take into consideration:

- *the general objectives and controls in Chapter 2, and*
- *the specific objectives and controls for the relevant Alpine Sub-region(s) in Chapters 3 and 4.*

As outlined under Sections 2.2 & 2.3 of the ARDCP 2025, the objectives and controls in this part do not apply to recreation infrastructure, lifting facilities, monitoring stations, ski-slope huts, snow-making infrastructure, on-mountain guest amenity buildings (including food and beverage outlets and toilets) and any ancillary structure associated with these land uses.

Chapter 2.4 relates to On-mountain development and infrastructure.

An assessment of the development in relation to Chapter 2.4 controls are provided below.

Chapter 2.4 - On-mountain development and infrastructure:

Controls	Response
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.	<i>Not applicable as the proposal is not for lift infrastructure or snowmaking infrastructure.</i>
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.	<i>Not applicable as the proposal is not for an aerial or surface lift.</i>
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.	<i>The proposal is for a mountain bike trail, not a walking trail.</i>
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.	<i>The proposed trail uses the natural terrain with minor modification to provide sustainable trails and quality guest experience.</i>

Chapters 2.5, 2.6, 2.7, 2.9, 2.10, 2.11, 2.12, 2.14, 2.15 & Chapter 3 of the ARDCP 2025 do not relate to the development or subject site.

Regarding Chapter 2.8 Aboriginal heritage, the site is not mapped within a heritage management zone under Appendix D of the ARDCP 2025 and Aboriginal heritage has been addressed under Section 5.2 of this report above with an Aboriginal Due Diligence assessment report provided in Appendix B.

Regarding Chapter 2.13 Biodiversity, natural water systems and water sensitive urban design, this has been addressed below.

2.13 Biodiversity, natural water systems and water sensitive urban design

Controls	Response
<u>All development:</u>	
C1. Except where development within the vegetated riparian zone (VRZ) is unavoidable or allowable under the Guidelines for Controlled Activity Approvals, or equivalent under the Water Management Act 2000, development is designed and sited to minimise disturbance of the of the natural drainage system and avoid VRZs, shown in Figure 13.	<i>The proposed trail has been carefully designed and located to avoid impacting the VRZ associated with both 1st order watercourses as addressed in this report above.</i> <i>Where the trail requires to traverse the watercourse, it uses the existing culvert associated with the ski run and access track.</i> <i>The proposal has therefore been designed to minimise disturbance of these adjacent natural drainage systems.</i>
C2. Development is designed and sited to avoid or minimise impacts on significant natural landform features including slopes, ridges and rock outcrops.	<i>The proposal avoids significant landform features such as slopes, ridges and rock outcrops.</i>
C3. Development that may result in biodiversity impacts (excluding vegetation removal) is supported by rehabilitation and monitoring measures consistent with the Rehab Guidelines.	<i>The proposal will be required to be rehabilitated in accordance with the Rehab Guidelines.</i>
C4. Impervious surfaces are minimised and soft landscaping incorporated to the maximum practical extent to promote water infiltration and reduce stormwater run-off.	<i>The proposal is for natural mountain bike trail, avoiding the use of impervious surfaces, except for minor rock armouring where necessary.</i>
C5. Except as part of minor developments or alterations and additions and where site conditions allow, water sensitive urban design (WSUD) measures are incorporated into development to minimise adverse impacts on sensitive and water-dependent ecosystems such as bogs and fens. Within the Alpine Region, this includes all areas of alpine and sub-alpine peatlands, damp herb fields and fens.	<i>Not applicable.</i>
C6. Stormwater runoff from communal areas for new development is treated through communal WSUD measures to ensure water pollution is avoided.	<i>Not applicable.</i>

6.1.4 SECTION 4.15(1)(a)(iiiia) – PLANNING AGREEMENTS

There are no Planning Agreements applicable to the Kosciuszko Alpine Resorts under the SEPP Regional Precincts.

6.1.5 SECTION 4.15(1)(a)(iv) – REGULATIONS

The development application has been made in accordance with the requirements contained in the Environmental Planning and Assessment Regulation 2021.

6.1.6 SECTION 4.15(1)(b) – LIKELY IMPACTS

Natural Environment:

The flora and fauna assessment provided in Appendix A, has concluded that the proposed development is unlikely to have a significant effect on threatened species, endangered populations, ecological communities, or their habitats.

The likely impacts on the natural environment have therefore been comprehensively identified in the report and this SEE.

These impacts have largely been minimised as a consequence of the site analysis process as documented in Section 3 of this SEE, which includes in summary:

- Locate trails within areas that are less constrained in regard to vegetation, slope and watercourses, where possible.
- Apply IMBA Sustainable Trail Guidelines.
- Undertake a ground-truthing process.
- Undertake preliminary site assessment.
- Undertake fieldwork.
- Re-align, adjust and refine trails.

Overall, the impacts generated by the proposal on the natural environment have been minimised through the site analysis process undertaken and through the implementation of the measures identified in the SEMP.

Built Environment:

The impacts on the built environment are expected to be minimal given the distance of the components of the project from the nearest tourist accommodation and the minimal disturbance of the activity which is relatively quiet and is already being undertaken within the resort and commonly found in other tourist destinations within the locality, region and worldwide.

Social and Economic impacts in the locality:

The social and economic impacts from the development are expected to be positive as the development will provide a combined a technical/ intermediate to advanced jump trail offering guests an exciting new style of trail that can be used by riders with multiple ability levels.

The construction and employment generated will add to the overall positive economic impacts generated by the development with both construction and ongoing operational jobs being created.

The development will represent a further capital improvement in summer tourism for the resort, which is not only important for Thredbo but for the locality and wider region.

6.1.7 SECTION 4.15(1)(c) – SUITABILITY OF THE SITE

The location of the proposed trail has been subject to an extensive site analysis process.

Overall, the site is considered suitable for the proposed trail.

6.1.8 SECTION 4.15(1)(d) – SUBMISSIONS

The proposed works are located more than 50m from the closest tourist accommodation building and therefore cannot be not required to be publicly notified or advertised under the Departments Community Participation Plan, 2024.

In accordance with Table 2 of the Departments CPP 2024, where the site is located more than 50m away from tourist accommodation will not exhibited.

Accordingly, there is no lawful requirement allowing for public exhibition or notification for the proposed development.

Consequently any submissions received are not 'submissions made in accordance with this Act or the regulations' and therefore are not matters for consideration under Section 4.15(1)(d) of the EP&A Act, 1979.

6.1.9 SECTION 4.15(1)(e) – THE PUBLIC INTEREST

The proposal is considered to be within the public interest.

6.1.10 SECTION 4.46 – INTEGRATED DEVELOPMENT

As outlined above, the proposed trail has been carefully designed and located in response to the two 1st order watercourses and avoid their respective VRZ in accordance with Guidelines for riparian corridors on waterfront land.

However, due to the proximity of the trail to these watercourses, the proposal is an Integrated Development under Section 4.46 of the EP&A Act, 1979, requiring a Controlled Activity Approval under the Water Management Act 2000.

6.2 BIODIVERSITY CONSERVATION ACT, 2016

The Biodiversity Conservation Act 2016 and Local Land Services Amendment Act 2016 together with the Biodiversity Conservation Regulations 2017 apply to the subject site and proposed development.

The proposed works avoid the removal of any areas of native vegetation mapped within the Biodiversity Values Map as defined in the NSW Biodiversity Conservation Regulation 2017 (BC Reg), as shown in the Fauna and Flora Assessment provided in Appendix A.

An extract of the Biodiversity Values Map for the site is provided below in figure 26.



Figure 26: Biodiversity Values Map for the subject site

Regarding the clearing threshold, the site is located within a National Park and is zoned C1 – National Park under the Snowy River Local Environmental Plan, 2013 (SR LEP, 2013).

Consequently, the site does not have a minimum lot size, under the SR LEP 2013.

Therefore, the clearing threshold is based on the lot size of the subject site.

The proposed trail is located within the KT head lease area. Therefore, with the size of the head lease allotment over 40 hectares, but less than 1000 hectares, the biodiversity offsets scheme threshold for Thredbo Alpine Resort is 1 hectare (10,000m²).

Therefore, the clearing threshold is 1 ha of clearing of native vegetation without having to undertake a Biodiversity Assessment Method (BAM) assessment and therefore triggering the Biodiversity Offsets Scheme (BOS).

The proposed clearing of native vegetation has been measured to be approximately 0.18ha, below the clearing threshold and the BOS therefore is not triggered.

Accordingly, it is unlikely that the proposal will result in any substantial adverse impacts on the environment or have any significant effects on threatened species, endangered populations, ecological communities, or their habitats. Therefore, no further assessment is required under the BC Act, 2016.

7. CONCLUSION

The proposed Section 44 mountain bike trail will provide a technical/ intermediate to advanced jump trail focusing on highspeed technical sections while incorporating jumps built into the natural terrain.

The trail provides an alternative trail option from the Flow Trail, with the first section of trail located within Subalpine Woodland vegetation and comprising of a combination of long turns and technical straight sections that will have more of a natural construction and hand cut feel, with a narrower trail tread. The second part of the trail will use the existing disturbed Section 44 access trail and ski run, and will incorporate large tabletops, hip jumps, berms and the natural features available with a wider trail tread.

The new trail is 1015m in length and has been designed to diversify the trail network offering guests an intermediate/advanced jump trail and introduce an exciting new style of trail that can be used by riders with multiple ability levels.

The proposed trail alignment has been identified and designed by KT and reviewed by the Dabyne Planning as well as Eco-Logical Australia to determine an appropriate alignment that fulfils both an improved mountain bike trail outcome and resort operational outcome, whilst minimising impacts on the environment.

This SEE has concluded that following an extensive design and environmental assessment process, the proposed development can further enhance Thredbo as the Australian leader of Australia's gravity-based mountain bike resorts, whilst minimising impacts on the environment.

This conclusion has been derived by following a comprehensive site analysis process, which resulted in the careful design and siting of the trail to avoid the two adjacent watercourses and their VRZ, therefore avoiding their higher valued Subalpine Riparian Scrub vegetation. Potential environmental, construction and operational impacts associated with the trail alignment has been mitigated through this site analysis process, whilst ensuring that the overall trail objectives would not be compromised, and the key design principles upheld.

Any associated impacts will be further minimised through the application of the measures in the Site Environmental Management Plan.

To ensure that all the environmental and associated legislation is complied with and fulfilled, the proposed development has been considered in regard Section 4.15 of the Environmental Planning and Assessment Act, 1979, Biodiversity Conservation Act, 2016, and Chapter 4 of the State Environmental Planning Policy (Precincts – Regional) 2021.

The proposal has been found to be consistent with the above legislation and relevant Environmental Planning Instrument, as detailed in this SEE.

On balance, the proposed development will generate positive social and economic impacts for the resort and forms part of creating a world-class mountain bike trail network at Thredbo.

APPENDIX A

FAUNA AND FLORA ASSESSMENT

A stylized topographic map with grey contour lines is positioned on the left side of the page, extending from the top left towards the bottom left.

Section 44 Mountain Bike Trail – Thredbo Alpine Resort – Flora and Fauna Assessment

Kosciuszko Thredbo Pty Ltd

DOCUMENT TRACKING

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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
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DCCEEW (NSW)	NSW Department of Climate Change, Energy, the Environment and Water
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
LGA	Local Government Area
NSW	New South Wales
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 Section 44 mountain bike trail at Thredbo Alpine Resort.

The construction of the proposed realignment will require the clearing of small trees, shrubs and groundcovers in a 4 m wide corridor where the trail traverses remnant native vegetation. The trail design and construction incorporate a range of measures to minimise and mitigate the impacts on vegetation communities and fauna habitats, and on the environment generally. The alignment has been chosen to avoid locations that are particularly sensitive i.e. Subalpine Riparian Scrub.

The proposal will not trigger the Biodiversity Offsets Scheme (BOS), as it will not encroach on any area of land identified on the Biodiversity Values map, and the total clearing of native vegetation is significantly less than the 1 ha threshold at which the BOS is triggered.

The study area and immediate surrounds was found to support one native vegetation community: Subalpine Woodland, with parts of the development footprint (0.18 ha) comprising Exotic Grassland or other heavily disturbed vegetation. No threatened flora species were recorded within the study area during the survey period and none are considered likely to occur there given the general absence of suitable habitats. The study area does not support any endangered ecological communities. Only approximately 0.18 ha of Subalpine Woodland is expected to be affected in association with the proposal. Whilst this comprises an adverse impact, it is considered acceptable given the very small proportion of the extant extent of the community within the Thredbo Resort Area, 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, Eastern Pygmy-possum, Gang-gang Cockatoo, Olive Whistler, Pilotbird, Pink Robin, Scarlet Robin, 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, and has been designed to avoid potentially important habitats such as the nearby Subalpine Riparian Scrub. 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 necessary.

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 to accompany a proposal to construct the Section 44 mountain bike trail, at Thredbo Alpine Resort. This flora and fauna assessment 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 biodiversity.

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 development is for the construction of the Section 44 mountain bike trail. The proposed trail will be a technical intermediate to advanced jump trail with technical sections and jumps built into the natural terrain. The trail will branch off the Flow trail below the Woody's Trail turnoff and above the Flow Trail jump park section and rejoin the lower section of the Flow Trail above the cross-over structure. The first section of the trail will be located in forest with the second part following the existing Section 44 access trail and ski run.

The proposed trail will result in an expected maximum disturbance footprint width of 4 m and is expected to affect 0.18 ha of native vegetation.

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

- The clearing of shrubs and groundcovers in a 4 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 less than 4 m. The clearing will be undertaken with a mix of hand tools i.e. chainsaws and brush-cutters, and machinery i.e. mini-excavator.
- In general, it is possible to align the trail to avoid tree removal, however there will be some areas where the removal of some 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.

An overview of the proposal is shown in Figure 1 and further identified in Photos 1-6. A more detailed description of the proposal is also provided in the Statement of Environmental Effects for the proposal (Dabyne Planning 2025).

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 0.18 ha of native vegetation (Subalpine Woodland).

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

- The footprint of the proposed direct impacts is relatively small.
- The development has been designed to avoid the nearby Subalpine Riparian Scrub which provides known habitat for the threatened *Pachycephala olivacea* (Olive Whistler).
- A significant proportion of the areas affected are already heavily disturbed.
- 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. Similar impacts 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.

Whilst the proposal will result in increased noise and human activity whilst in operation, these increases will occur in areas that are already subject these impacts in association with chairlifts, skiing, mountain biking and resort operations. The proposal is not expected to have any substantial adverse impacts on habitat connectivity as the disruptions to existing connectivity will be minor, and only up to 4 m in width.

1.3 Subject site, study area and locality

The “subject site” comprises those areas, as described in Section 1.1 and Figures 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 indirect impacts anticipated beyond the development footprint, as shown 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 Biodiversity Offset Scheme

The proposal does not trigger the NSW Biodiversity Offset Scheme (BOS) as:

- The proposal will not affect any land mapped within the Biodiversity Values Map as defined in the NSW Biodiversity Conservation Regulation 2017 (BC Reg).
- The area of native vegetation affected will be approximately 0.18 ha, which is well below the threshold (1 ha) trigger for the BOS.
- The proposal will not result in a significant impact on any threatened species, populations or communities listed under the NSW *Biodiversity Conservation Act 2016* (BC Act).

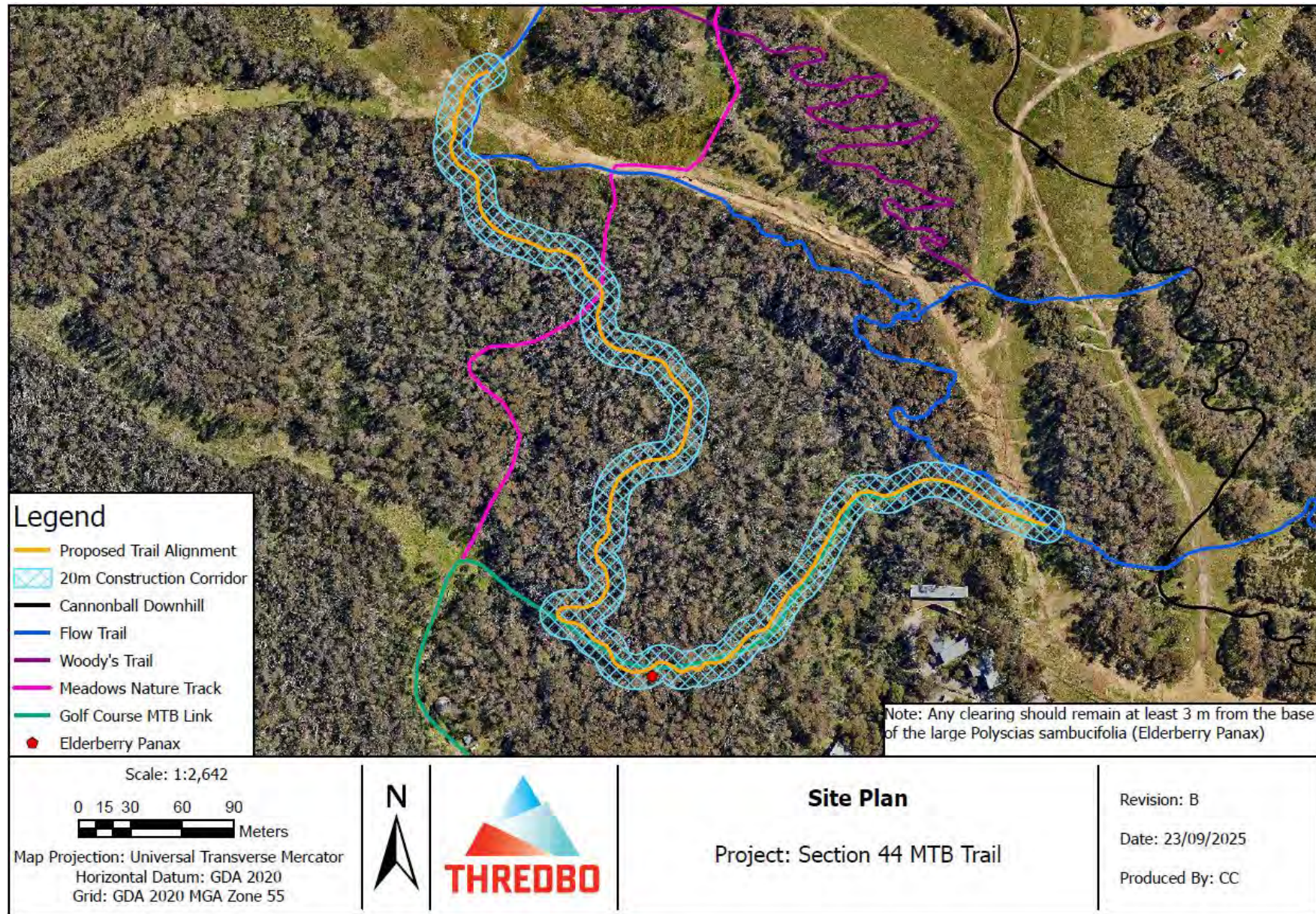


Figure 1: The proposed trail alignment.

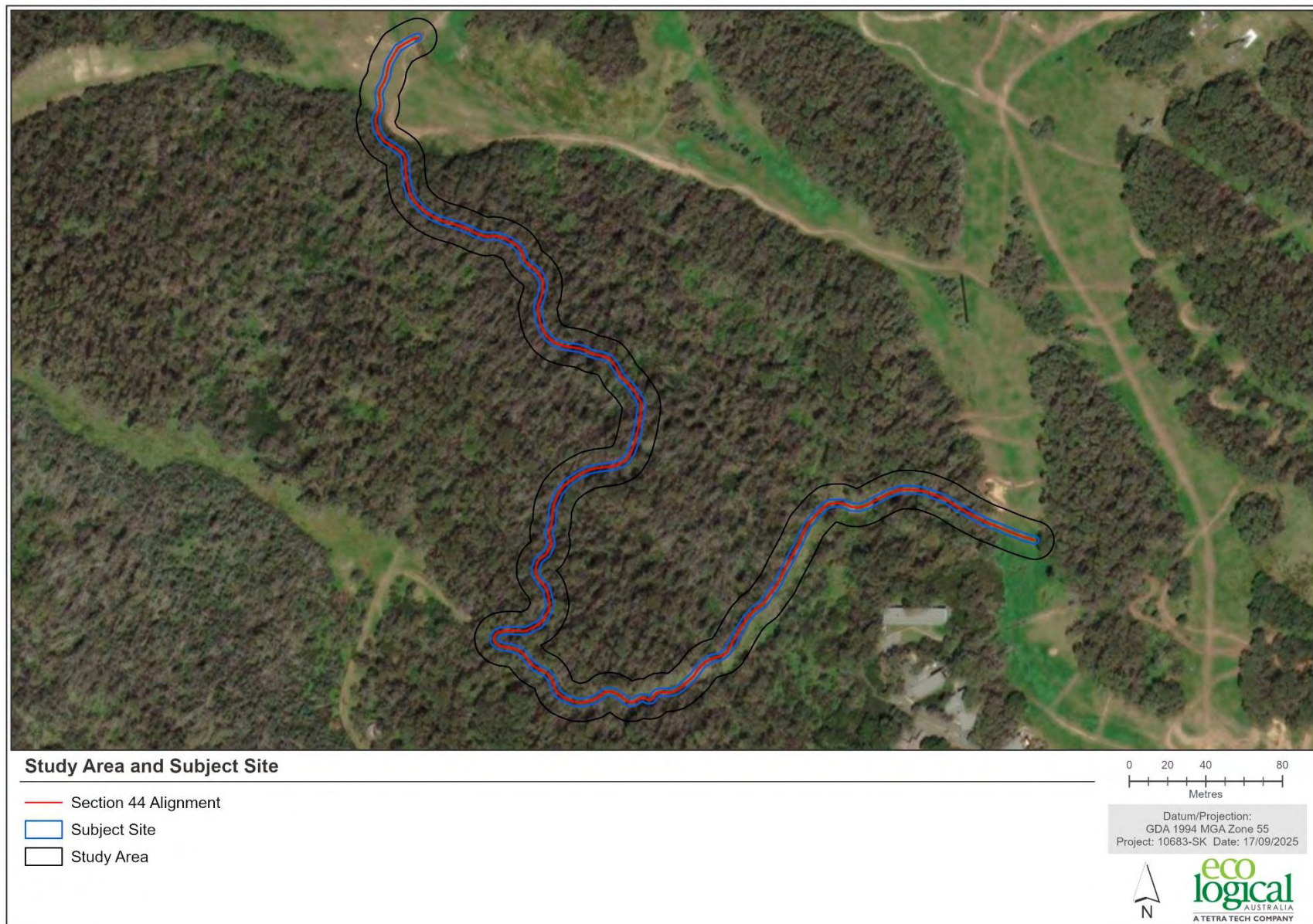


Figure 2: The subject site and study area.



Photo 1: The first part of the proposed trail traverses dense Subalpine Woodland on spur which leads down to the Section 44 access trail. The trail follows the spur thus avoiding the watercourses and associated vegetation on either side.



Photo 2: The proposed trail crosses the Meadows Nature Track.



Photo 3: The proposed trail descends the Subalpine Woodland on the spur eventually joining the Section 44 access trail.



Photo 4: The proposed trail then follows the disturbed lower and upper edges of the existing Section 44 access trail avoiding obstruction of the access trail and including a range of jumps.



Photo 5: The proposed trail utilises the disturbed cut and batter of the existing Section 44 access trail as it heads back towards the Supertrail ski run where it will rejoin the existing Flow Trail.



Photo 6: The proposed trail utilises the disturbed cut and batter of the existing Section 44 access trail as it heads back towards the Supertrail ski run where it will rejoin the existing Flow Trail. The proposed trail, by using the existing access trail, avoids any impacts on the Subalpine Riparian Scrub associated with the watercourses that the existing trail traverses.

1.5 Topography, geology and soils

The study area occupies moderately sloping east facing slopes at an altitude of between approximately 1460 m and 1400 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 unnamed creeks which are tributaries of the Thredbo River but will not traverse any mapped watercourses.

1.6 Disturbances

Parts of the study area have already been disturbed in association with the existing the existing Section 44 access trail and ski run. These disturbed areas are generally dominated by introduced grasses such as *Festuca rubra* (Red Fescue) and *Agrostis capillaris* (Browntop Bent), and a range of exotic herbs including *Acetosella vulgaris* (Sheep Sorrel), *Trifolium repens* (White Clover), and *Hypochaeris radicata* (Flatweed). The areas of woodland to be affected by the proposal are generally relatively undisturbed with only minor occurrences of cosmopolitan exotic grasses and herbs and scattered occurrences of other weeds, particularly *Rubus* spp. (Blackberry) and *Ilex aquifolium* (Holly).

1.7 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 (Dabyne Planning 2025). 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.

1.7.1 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.

1.7.2 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.

1.7.3 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 DCCEEW.

1.7.4 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.

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 6 May 2025.

2.2.1 Flora surveys

A botanical survey was conducted in the study area by ELA Principal Ecologist Ryan Smithers on 6 May 2025.

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. 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 classified to 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.

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 6 May 2025.

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 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 gather the data necessary 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 TECs 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 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 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 community: Subalpine Woodland, with Exotic Grassland and Disturbed Vegetation on the ski slopes, as shown in Figure 3. Whilst the proposed alignment traverses a patch of Subalpine Riparian Scrub, it does so on the existing Section 44 access trail such that there will be no impacts on this vegetation community, which the trail alignment has been designed to avoid.

3.2.1 Subalpine Woodland

Subalpine Woodland dominates the study area and surrounds, as shown in Figure 3. It is the most dominant community within the Thredbo Resort area covering an estimated 443 ha (Ecology Australia 2002). The community does not correlate well with any PCT, however is closest to PCT 3381 - *Kosciuszko Alpine Sally Woodland* and 3307 - *Kosciuszko-Namadgi Alpine Ash Moist Grassy Forest*.

The canopy is dominated by dense regrowth *Eucalyptus pauciflora* (Snow Gum) to a height of approximately 14-20 m and percent foliage cover (PFC) of up to 60%. The understorey is dominated by *Bossiaea foliosa* (Leafy Bossiaea) to a height of up to 2.5 m with PFC of 70-90%. Other understorey shrubs which occur less frequently include *Olearia phlogopappa* (Dusty Daisy-bush), *Tasmannia xerophila* subsp. *xerophila* (Alpine Pepperbush), *Prostanthera cuneata* (Alpine Mint Bush), and *Polyscias sambucifolia* (Elderberry Panax).

The groundcover is typically sparse given the density of the understorey and includes patches of species such as *Poa ensiformis* (Purple-sheathed Tussock-grass), *Asperula gunnii* (Mountain Woodruff), *Senecio gunnii*, *Geranium potentilloides* var. *potentilloides*, *Acaena novae-zelandiae* (Bidgee Widgee), *Hydrocotyle algida* and *Polystichum proliferum* (Mother Shield Fern).

A single very large specimen of Elderberry Panax occurs just downslope of the existing Section 44 trail, as shown in Photo 7. The proposed trail alignment should be micro-sited to avoid this plant which is a very large specimen.

3.2.2 Exotic Grassland and Disturbed Ski Slopes

The most heavily disturbed parts of the study area, i.e. the access track and ski slopes, support exotic grassland, with occasional patches of native shrubs, grasses, and forbs. These areas are characterised by an abundance of exotic grasses and herbs, the most common species comprising *Festuca rubra*, *Agrostis capillaris*, and a range of exotic herbs including *Hypochaeris radicata*, *Acetosella vulgaris*, and *Achillea millefolium*.

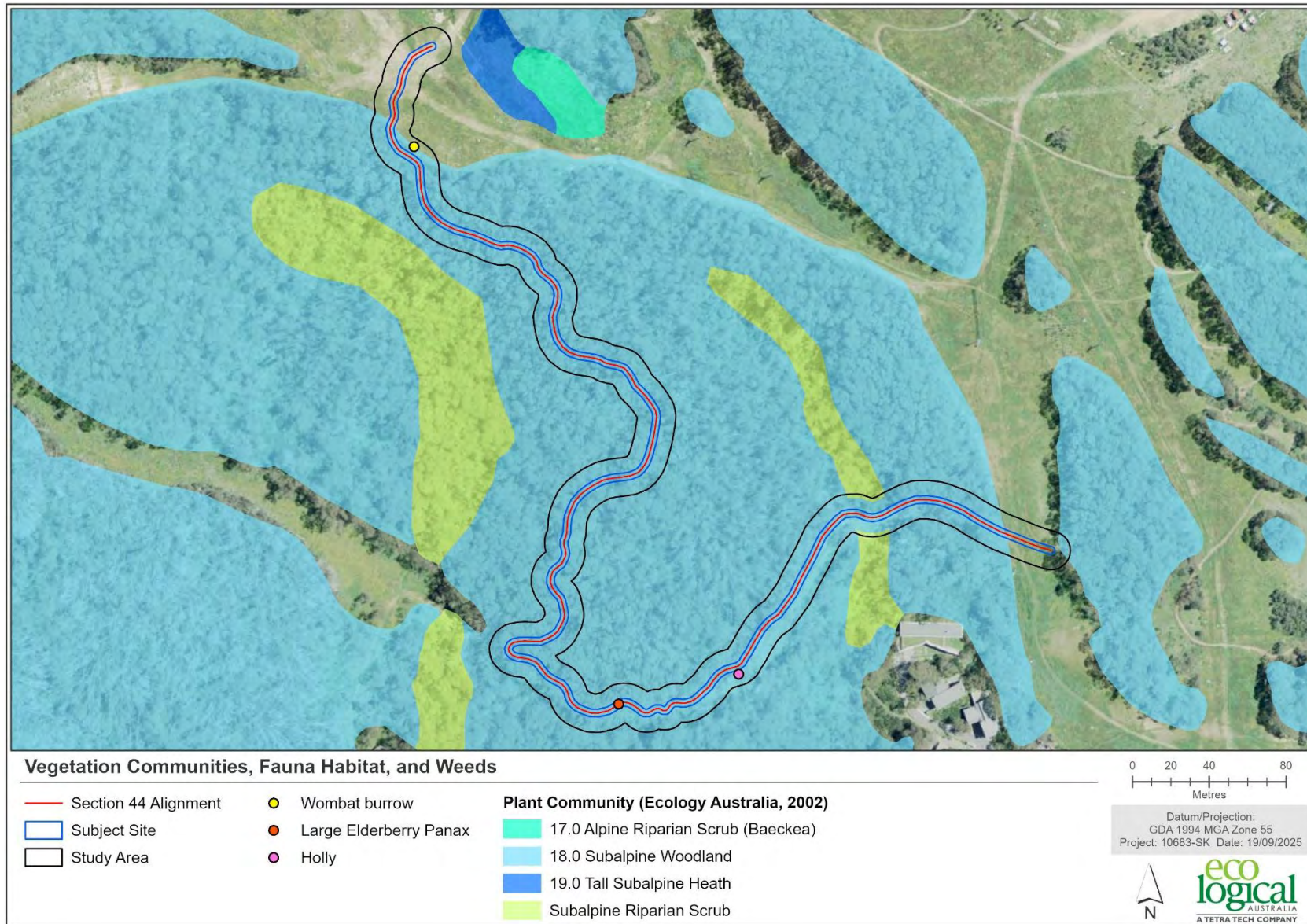


Figure 3: Vegetation communities and fauna habitats within the study area.



Photo 7: Very large *Polyscias sambucifolia* (Elderberry Panax) plant just below the existing Section 44 access trail.

3.3 Fauna

3.3.1 Fauna habitats

The study area contains a limited range of fauna habitats given its narrow linear nature. 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 within the study area provides habitat for native birds, terrestrial and arboreal mammals, microchiropteran bats 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), *Petroica boodang* (Scarlet Robin), *Petroica rodinogaster* (Pink Robin) and *Pachycephala olivacea* (Olive Whistler), all of which are known from the Thredbo Resort area, and in the case of the Flame Robin and Olive Whistler, 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 marginal potential foraging and sheltering habitat for *Mastacomys fuscus* (Broad-toothed Rat), which is likely to be relatively 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 known habitat for *Vombatus ursinus* (Common Wombat) and one active burrow was observed as shown in Figure 3. There are likely to be other burrows within the study area.

The rock habitats, logs and dead trees within the study area provide a limited basking and foraging resource for reptiles, however the study area does not provide suitable habitat for any threatened reptiles such as *Cyclodomorphus praealtus* (Alpine She-oak Skink) or *Liopholis guthega* (Guthega Skink), given the lower elevation and the density of the canopy and understorey.

The 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* (European Rabbit) and *Cervus unicolour* (Sambar Deer).

4. Impact assessment

4.1 Impacts on vegetation communities

4.1.1 Subalpine Woodland

The proposal will result in the removal of approximately 0.18 ha of the Subalpine Woodland vegetation community in association with the clearing of the up to 4 m wide trail disturbance footprint where the trail traverses intact patches of the community.

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. The SVTM PCT map estimates that 69,187 ha or approximately 99% of the original extent of the *Kosciuszko Alpine Sally Woodland* is still extant. Furthermore, the vast majority of the occurrence of the community in NSW is within conservation reserves and in particular with Kosciuszko National Park. Whilst there have been reductions in the extent of the community in recent decades in association with other developments within the Thredbo Resort Area, the community remains widespread and well conserved within Kosciuszko National Park.

In this context the loss of approximately 0.18 ha of Subalpine Woodland (0.04% 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.

4.3 Impacts on flora species of conservation significance

No threatened flora species, or flora species identified on the schedules of the Kosciuszko National Park Plan of Management (KNPPOM) (DEC 2006), were recorded within the study area during the survey period and none are expected to occur there. The study area does support individuals of *Podocarpus lawrencei* (Mountain Plum Pine) which is considered to be of conservation significance, particularly where it occurs as a shrubland (DEC 2006) or closed heath, and where it is associated with, and a major foraging resource for *Burramys parvus* (Mountain Pygmy-possum) populations. However, Mountain Plum Pine is common in the subalpine and montane woodlands and forests in the Thredbo Valley (Hogg 1987 in ENFAC 2008). The proposal may result in the loss of a few Mountain Plum Pine shrubs, however, it will not affect any Mountain Plum Pine Closed Heath, or other potentially significant stands of the species. The impacts of the proposal on Mountain Plum Pine are negligible in the context of the abundance of the species within the Thredbo Resort area and elsewhere in the locality.

4.4 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, Gang-gang Cockatoo, Olive Whistler, Scarlet Robin, 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 native vegetation (approximately 0.18 ha), and a few rocks, none of which provide important fauna habitats.

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.

Impacts on the Eastern Pygmy-possum, if it does occur within the study area, would be minor given the narrow linear nature of the proposed vegetation clearing and the extensive surrounding forests and woodlands.

The proposal will not adversely affect the Gang-gang Cockatoo, Olive Whistler, Pilotbird, Scarlet Robin 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. The proposal was designed to ensure that the trail alignment avoids the Subalpine Riparian Scrub that occurs downslope of the trail and which provides known habitat for the Olive Whistler.

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

4.5 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 Appendix 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	—	E	E	Potential
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	—	V	—	Potential
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	—	E	E	Potential
<i>Petroica boodang</i>	Scarlet Robin	—	V	—	Potential
<i>Petroica phoenicea</i>	Flame Robin	—	V	—	Potential
<i>Petroica rodinogaster</i>	Pink Robin	—	V	—	Potential
<i>Pachycephala olivacea</i>	Olive Whistler	—	V	—	Potential
<i>Pycnoptilus floccosus</i>	Pilotbird	—	V	V	Potential

V = Vulnerable, E = Endangered

4.6 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.

4.7 Conclusion of EPBC Act 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

1. All disturbance should be kept to the minimum required to achieve the proposal.
2. All machinery to be used during the construction phase should be limited to the existing disturbed areas and access tracks and the proposed trail alignments as far as is possible.
3. 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.
4. Any clearing associated with the proposed development should remain at least 3 m from the base of the large *Polyscias sambucifolia* (Elderberry Panax) plant shown in Photo 7 and Figure 3.
5. If any trees with a diameter at breast height (dbh) of greater than 200 mm are to be felled, then the tree must be inspected prior to felling by the appointed Environmental Officer for any potential hollows or fissures that could potentially be used for sheltering by the Eastern Pygmy-possum.
6. 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.
7. Any Blackberry, Holly or other problematic weeds detected within the study area should be controlled.

Sediment control

8. 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.
9. 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

10. Rehabilitation activities should be consistent with the resort areas rehabilitation guidelines (NGH Environmental 2007).
11. 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 Section 44 mountain bike trail at Thredbo Alpine Resort.

The study area and immediate surrounds was found to support one native vegetation community: Subalpine Woodland, with parts of the study area comprising Exotic Grassland or other heavily disturbed vegetation. No threatened flora species were recorded within the study area during the survey period and none are considered likely to occur there given the general absence of suitable habitats. The study area does not support any endangered ecological communities. Only approximately 0.18 ha 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, Eastern Pygmy-possum, Gang-gang Cockatoo, Olive Whistler, Pilotbird, Scarlet Robin, Pink Robin 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, and has been modified to avoid potentially important habitats such as the nearby Subalpine Riparian Scrub, which provides known breeding habitat for the Olive Whistler. 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 necessary.

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>Calotis pubescens</i>	Max Mueller's Burr-daisy	-	E	-	This species has been recorded from five sites in the Snowy Mountains of NSW (four of which, all in Kosciuszko National Park, are extant). It was first recorded in Victoria in the 19th Century but not seen again there until 2009 when a single large population was discovered south-east of Mt Hotham. It has also been detected recently in numerous locations in the northern parts of Kosciuszko National Park. It grows in subalpine treeless plains in herb-rich grassland (often dominated by <i>Poa hookeri</i>); not subject to periodic inundation. 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 above 1000 m. 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 bogs, alpine herbfield, sod tussock grassland, subalpine stream edges or moist 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	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					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.	
<i>Glycine latrobeana</i>	Clover Glycine	-	CE	V	Clover Glycine is found across south-eastern Australia mainly in native grasslands and grassy woodlands, and less so in dry sclerophyll forests, woodlands. There is no suitable habitat for the species within the study area. In NSW this species is known from the Tantangara area in the northern parts of Kosciuszko National Park.	No
<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. 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. There is no suitable habitat for the species within the study area.	No
<i>Pimelea bracteata</i>	-	-	CE	CE	<i>Pimelea bracteata</i> occurs in wetlands and along waterways and stream edges in high altitude treeless subalpine valleys. It can also occur in wet heathland and closed heath. It is endemic to New South Wales where it is currently known from the Southern Tablelands. The main areas of occurrence are in the northern area of Kosciuszko National Park, Scabby Range Nature Reserve, neighbouring State Forests and freehold land. There is no suitable habitat for the species within the study area.	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	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					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 for the species within the study area.	
<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 for the species within the 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	Feldmark 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	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					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.	
<i>Thesium australe</i>	Austral Toadflax	-	V	V	This species is semi-parasitic on roots of a range of grass species, mainly Kangaroo Grass. It is considered highly unlikely that it would occur within the study area.	Unlikely
<i>Viola improcera</i>	Dwarf Violet	-	-	V	Dwarf Violet occurs at high altitudes above ca. 1300 m and up to at least 1800 m elevation in open shrubland and snow-gum woodland. The species is known to grow in open areas on or near summits and upper slopes on rocky soil and is readily seen along tracks. There are no records of the species in the locality and the habitat for the species is marginal at best. It is considered unlikely that it would occur within the study area.	Unlikely
<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 no suitable habitat for the species within the study area.	No
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. The vegetation communities within the study area do not comprise this community.	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 <i>Empodisma minus</i> and is found in permanently wet areas, such as along streams, valley edges, valley floors where soils are waterlogged. The vegetation communities within the study area do not comprise this community.	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
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

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	-	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	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	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					Murray-Darling system (DPI 2006; McDowall 1980b). There is no suitable habitat within the study area.	
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 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.	Potential
<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		E	E	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	Potential

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					runways through dense vegetation of wet grass, sedge or heath and under the snow in winter.	
<i>Petauroides volans</i>	Southern Greater Glider		E	E	This species is associated with tall moist forests. It is considered unlikely that it would occur within the study area.	Unlikely
<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		E	E	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 occurs in ferny gullies. The species has recently been recorded at numerous locations in the northern parts of Kosciuszko National Park. It is considered unlikely that the species would occur within the study area or immediate surrounds give its rarity and the nature of the habitats there.	Unlikely
<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	CE	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.	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					Tadpoles occur predominantly in slow-flowing sections of streams. There is no suitable habitat within the study area.	
<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. It has recently been detected in many locations within the within the northern parts of Kosciuszko National Park suggesting a large population there. There is no suitable breeding habitat for the species within the study area and it is unlikely that it would occur there.	Unlikely
<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	Unlikely

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					study area does not include any suitable habitat for this species and it is considered unlikely that it would occur there.	
<i>Eulamprus kosciuskoi</i>	Alpine Water Skink		V	V	The alpine water skink has been observed at high elevations (above 1000 m above sea level (asl) and up to 2000 m asl), basking on granite boulders, tussocks and sphagnum moss along small alpine streams, bogs, and wet heath. It has also been observed along drainage lines, in tussock grasses, and up to hundreds of metres upslope, or otherwise away, from typical wetter habitat. In the Snowy Mountains and Brindabella Range, the species exhibits a high degree of habitat specialisation, being confined to sphagnum bog, fen, wet heath and, less frequently, wet sod-tussock grassland. The study area is typically too densely treed to provide suitable habitat for the species which is associated with more open and wet habitats at higher altitudes.	No
<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 is not associated with Subalpine Woodland and is highly unlikely to occur within the study area.	No
<i>Liopholis montana</i>	Mountain Skink		E	E	This species is known from the Snowy Mountains, Victorian Alps and ACT and is associated with rocky areas in a range of alpine and subalpine and montane vegetation communities above 600 m. 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 study area does not include any suitable habitat for this species. The study area is typically too densely treed to provide suitable habitat for the species which is associated with more open and typically rocky habitats. There are no records within the Thredbo resort area, with the nearest records being at Blue Cow mountain.	Unlikely
<i>Pseudemoia cryodroma</i>	Alpine Bog Skink		-	E	The alpine bog skink occurs primarily in alpine bog, riparian and wet heath areas above 1100 m elevation, and less commonly in alpine and subalpine grassland and dry treeless heath, drainage lines in subalpine meadows, and	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					in snow gum woodland. The study area is typically too densely treed to provide suitable habitat for the species which is associated with more open and wet habitats.	
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 abundant nectar sources with different flowering times to provide a reliable supply of nectar. The species would not occur within the study area.	No
<i>Aphelocephala leucopsis</i>	Southern Whiteface		V	V	This species inhabits dry woodlands with a sparse grassy understorey where it forages for insects and vegetable matter on the ground. The habitats within the study area are unsuitable for the species.	No
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow		V	-	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.	Unlikely
<i>Botaurus poiciloptilus</i>	Australasian Bittern		V	E	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.	No
<i>Collocephalon fimbriatum</i>	Gang-gang Cockatoo		E	E	Gang-gang Cockatoos live as pairs inhabiting woodlands of south-eastern Australia. The species feeds primarily on the seeds of eucalypts and acacias	Likely

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					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.	
<i>Calyptorhynchus lathami</i>	South-eastern Glossy Black-Cockatoo		V	V	This species occurs in forests and woodlands where She-oak feeding resources are prevalent and large tree hollows exist for breeding. There is no foraging or breeding habitat for the species within the study area and it is highly unlikely that it would occur there.	Unlikely
<i>Climacteris picumnus</i>	Brown Treecreeper (eastern subspecies)		V	V	This species occurs in Eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is not usually found in woodlands with a dense shrub layer. Fallen timber is an important habitat component for foraging. It is a sedentary species and is resident in many locations throughout its range, and is present in all seasons or year-round at many sites. Hollows in standing dead or live trees and tree stumps are essential for nesting. There is no habitat for the species within the study area.	No
<i>Daphoenositta chrysoptera</i>	Varied Sittella		V	—	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.	Unlikely
<i>Falco hypoleucos</i>	Grey Falcon		E	V	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. 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.	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
<i>Gallinago hardwickii</i>	Latham's Snipe		V	V	This species may occur in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. They also use crops and pasture. The study area does not provide any potential habitat for the species and it would not occur there.	No
<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 (Acacia pendula), Brigalow (A. harpophylla) 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 Amyema. Nesting occurs from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping Eucalyptus spp., Allocasuarina and Casuarina spp. (Sheoaks), Melaleuca sp. (Paperbark) or Mistletoe branches. It is highly unlikely that the species would occur within the study area.	Unlikely
<i>Hirundapus caudacutus</i>	White-throated Needletail		V	V, 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>Melanodryas cucullata cucullata</i>	South-eastern Hooded Robin		E	E	This species prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. It requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. The habitats within the study area are unsuitable for this species which is rarely recorded in the locality.	Unlikely
<i>Lathamus discolor</i>	Swift Parrot		CE	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 (Eucalyptus robusta), Spotted Gum (Corymbia maculata), Red Bloodwood (C. gummifera), Mugga Ironbark (E. sideroxylon), and White Box (E. albens). It is considered highly unlikely that the species would occur within the study area.	Unlikely

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
<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 Boronia species and the everlasting daisy (<i>Helichrysum pumilum</i>). After breeding, 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.	No
<i>Neophema chrysostoma</i>	Blue-winged Parrot		V	-	Blue-winged parrots breed on mainland Australia south of the Great Dividing Range in southern Victoria from Port Albert in Gippsland west to Nelson, and sometimes in the far south-east of South Australia, and the north-western, central and eastern parts of Tasmania. A partial migrant, variable numbers of birds migrate across Bass Strait in winter, apparently making the flight non-stop based on the scarcity of records from the Bass Strait islands. During the non-breeding period, from autumn to early spring, birds are recorded from northern Victoria, eastern South Australia, south-western Queensland and western New South Wales, with some birds reaching south-eastern New South Wales and eastern Victoria, particularly on the southern migration. Blue-winged parrots inhabit a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. They tend to favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones. Blue-winged parrots breed in Tasmania, coastal south-eastern South Australia and southern Victoria. During the breeding season (spring and summer), birds occupy eucalypt forests and woodlands (Higgins 1999). Blue-winged parrots form monogamous pairs. Nests are made in hollows, preferably with a vertical opening, in live or dead trees or stumps. There is no suitable habitat for the species within the study area.	Unlikely

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
<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.	Likely
<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 subalpine woodlands with a heathy understorey and Montane Forests rather than alpine heaths. The species may forage within the study area from time to time.	Potential
<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. The habitat for the species within the study area is marginal however the species is recorded within the Thredbo Valley from time to time and has been recorded by the author in similar habitats to those within the study area.	Potential
<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 would likely use the more open habitats within the study area from time to time for foraging.	Likely

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
<i>Pycnoptilus floccosus</i>	Pilotbird		V	V	The Pilotbird occurs in temperate wet sclerophyll forests and occasionally temperate rainforest, where there is dense undergrowth with abundant debris. Pilotbirds are known from the Thredbo Resort area and the species may occur within the study area from time to time.	Potential
<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
<i>Stagonopleura guttata</i>	Diamond Firetail		V	V	Found in grassy eucalypt woodlands, open forests, mallee, Natural Temperate Grasslands, riparian areas and sometimes lightly wooded farmlands. The habitat for the species within the study area is marginal and it is not regularly detected within the Thredbo Resort area.	Unlikely
MIGRATORY TERRESTRIAL AND WETLAND SPECIES LISTED UNDER EPBC ACT						
<i>Hirundapus caudacutus</i>	White-throated Needletail		V	V, M	SEE DIURNAL BIRDS ABOVE	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

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
<i>Neophema chrysogaster</i>	Orange-bellied Parrot		E	E, M	SEE DIURNAL BIRDS ABOVE	No
<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		CE	CE, M	SEE DIURNAL BIRDS ABOVE	No
<i>Gallinago hardwickii</i>	Latham's Snipe		V	V, M	SEE DIURNAL BIRDS ABOVE	No
<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 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

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)
- *Petroica boodang* (Scarlet Robin)
- *Petroica rodinogaster* (Pink Robin)
- *Pachycephala olivacea* (Olive Whistler)
- *Pycnoptilus floccosus* (Pilotbird)

(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,

Fauna

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 marginal potential foraging and sheltering habitat for the Broad-toothed Rat. Whilst no evidence of the species was observed within the study area, it has been observed nearby, and it is possible that the species occurs within the study area from time to time.

The proposed development will affect only a very small amount of the potential habitat for the species in the Thredbo Resort area and will not affect any key resources for the species. As such, the proposed development is unlikely to adversely affect a significant proportion of the home range of one or more 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 clearing required. 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 1,800 m. It is likely that the Eastern Pygmy-possum occurs in the subalpine and montane habitats of the Thredbo Resort.

The proposal 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 trails given the relatively small area to be affected during the construction phase and the fact that no hollow-bearing trees will be removed. 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* (likely 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. 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. The foraging resources (generally eucalypt trees) to be removed in association with the proposed development would not be important for the species, given the extent of foraging resources in the Thredbo Resort area.

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* (likely 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.

Scarlet Robin *Petroica boodang* (potential occurrence).

This Scarlet Robin 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. The habitat for the species within the study area is marginal however the species is recorded within the Thredbo Valley from time to time.

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 Scarlet Robin such that a viable local population of the species is likely to be placed at risk of extinction.

Pink Robin *Petroica rodinogaster* (potential occurrence).

The Pink Robin is common in Tasmania, uncommon in Victoria and rare in NSW. It is known to breed in low numbers in Kosciuszko National Park, including in a small patch of Montane Forest (dominated by Mountain Ash) which occurs just beyond the study area (MGP 1996), on the high side of Sundowner ski run. During the non-breeding period the species has been observed in more open areas including trees on the edge of Thredbo golf course.

Surveys for Pink Robins within the Thredbo Lease area in 1986 and 1987 (Margules Partners 1987) demonstrated the high fidelity of Pink Robins with deep sheltered gullies supporting Mountain Ash forest in that each of the three nests detected occurred in such habitats, and no Pink Robins were observed more than 150 m from these habitats during the breeding season.

Whilst the proposed will affect a small amount of potential foraging habitat for the species, it is highly unlikely to affect breeding given the species demonstrated high fidelity with preferred breeding habitats. The proposed development was modified to ensure that it avoided the nearby known breeding habitat associated with the Montane Forest.

Under these circumstances, the proposal is considered unlikely to disrupt the life cycle of the Pink 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 species was not recorded within the study area during the survey period however it is likely to occur there from time to time.

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 are 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).

Pilotbird *Pycnoptilus floccosus* (potential occurrence).

The Pilotbird occurs in temperate wet sclerophyll forests and occasionally temperate rainforest, where there is dense undergrowth with abundant debris. Pilotbirds are strictly terrestrial, living on the ground in dense forests with heavy undergrowth. Largely sedentary, they are typically seen hopping briskly over the forest floor and foraging on damp ground or among leaf-litter. Flight is described as fairly weak, though, if disturbed, birds can sometimes ascend into shrubs (but no more than 1–2 m from the ground). They are typically seen in pairs or occasionally in family parties, occupying small territories all year round.

Pilotbirds forage mostly in pairs for insects, and occasionally eat seeds and fruits. They use their bills and feet to turn and scratch leaf litter for food. Males are often seen feeding females. Pilotbirds have been associated with Superb Lyrebirds, foraging in their wake as they scratch the forest floor. Pilotbirds are known from the Thredbo Resort area and may occur within the study area from time to time.

The proposed development will result in the loss of a small amount of potential foraging and breeding habitat for the Pilotbird. 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 are contiguous with the study area in the extensive Subalpine Woodland and other forests within the Thredbo Valley.

Under these circumstances it is considered unlikely that the proposed development would affect the life cycle of the Pilotbird 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 small area of marginal potential habitat for the Broad-toothed Rat and Eastern Pygmy-possum and will not affect any known Broad-toothed Rat communal nesting or likely breeding sites for either species. The proposed development will result in the modification of a very small amount of potential foraging and breeding habitat (0.18 ha) for the Flame Robin, Scarlet Robin, Olive Whistler and Pilotbird, and only a very small amount of potential foraging habitat for the Gang-gang Cockatoo and Pink Robin.

(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 2.5-3 m in width, but up to 4 m. 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 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.

In the context of the extent of similar habitat available for the Gang-gang Cockatoo, Olive Whistler, Pink Robin, Scarlet Robin, Flame Robin and Pilotbird 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 0.18 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, Gang-gang Cockatoo and Pilotbird.

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;	No. The proposal does not impact on a World Heritage Property or a National Heritage Place as addressed in the SEE. (listed natural: Australian Alpine National Parks and Reserves; nominated historic: Snowy Mountains Scheme NSW).
(b) any environmental impact on Wetlands of International Importance;	No. The proposal will not affect any part of Ramsar wetland.
(c) any impact on Commonwealth Listed Critically Endangered or Endangered Species;	Yes. The study area provides potential habitat for two Commonwealth listed endangered species: the Gang-gang Cockatoo and the Broad-toothed Rat. The significant impact criteria for endangered species are discussed below: a. lead to a long-term decrease in the size a population of a species, The proposed action will only affect a very small amount of potential habitat for these species in the context of the extent of potential habitat in the locality. The proposal will not affect any breeding or roosting habitat or otherwise adversely impact these species.

Matters to be addressed	Impact
	Under these circumstances, it is considered highly unlikely that the proposed action will lead to a long-term decrease in the size of the Gang-gang Cockatoo or Broad-toothed Rat population.
	b. reduce the area of occupancy of the species The proposed action will be limited to the loss or further modification of 0.18 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 or Broad-toothed Rat; nor affect these species ability to access habitats within or beyond the study area. Under these circumstances, the proposed action is highly unlikely to reduce the area of occupancy of the local population of the Gang-gang Cockatoo or Broad-toothed Rat.
	c. fragment an existing population into two or more populations The proposed action will be limited to the loss or further modification of 0.18 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 or Broad-toothed Rat; nor affect these species ability to access habitats within or beyond the study area. Under these circumstances, the proposed action will not fragment an existing population of the Gang-gang Cockatoo or Broad-toothed Rat into two or more populations.
	d. adversely affect habitat critical to the survival of a species No habitat within the development site is considered likely to be critical to the survival of the Gang-gang Cockatoo or Broad-toothed Rat. 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 and Broad-toothed Rat continue to occur within the Thredbo Resort Area despite a long history of similar and more extensive disturbances.
	e. disrupt the breeding cycle of a population It is considered highly unlikely that the Gang-gang Cockatoo would breed within the study area given the absence of hollow-bearing trees. Similarly, it is considered unlikely that the Broad-toothed Rat would breed within the study area given the absence of the species preferred wet heath and bog habitats. Under these circumstances, the proposed action will not disrupt the breeding cycle of a population of the Gang-gang Cockatoo or Broad-toothed Rat.
	f. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline The proposed action will modify a very small area of habitat for the Gang-gang Cockatoo and Broad-toothed Rat, but this area is unlikely to be important to these species in the context of the extent of potential habitat in the locality. 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 or Broad-toothed Rat is likely to decline.
	g. result in invasive species that are harmful to an endangered species becoming established in the endangered or critically endangered species' habitat The proposed action is unlikely to result in invasive species that are harmful becoming established in potential habitat of the Gang-gang Cockatoo or Broad-toothed Rat. Species such

Matters to be addressed	Impact
	as cats or foxes are already present in the landscape and are subject to control programs within the resort. h. introduce disease that may cause the species to decline The proposed action is unlikely to introduce disease that may cause the Gang-gang Cockatoo or Broad-toothed Rat to decline. i. interfere with the recovery of the species. As the proposed action is not considered to decrease or fragment any existing populations the recovery of the Gang-gang Cockatoo or Broad-toothed Rat is unlikely to be adversely impacted.
(d) any impact on Commonwealth Listed Vulnerable Species;	Yes. The study area provides potential habitat for one Commonwealth listed vulnerable species: the Pilotbird. The significant impact criteria in terms of the vulnerable species are discussed below: <i>a. lead to a long-term decrease in the size of an important population of a species.</i> Whilst the proposal will impact a relatively small amount of potential habitat for the Pilotbird, it is unlikely to impact adversely on any individual Pilotbirds, let alone decrease the size of an important population of the species. The noise and vibration associated with the proposal is likely to temporarily deter any Pilotbird 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. Under these circumstances the proposed action will not lead to a long-term decrease in the size of an important population of the Pilotbird. <i>b. reduce the area of occupancy of an important population</i> It is highly likely that the Pilotbird will continue to occur within the study area after the implementation of the proposed action. As such, the proposed action is highly unlikely to reduce the area of occupancy of the Pilotbird. <i>c. fragment an existing important population into two or more populations</i> The proposed action will not fragment an existing important population of the Pilotbird into two or more populations. <i>d. adversely affect habitat critical to the survival of a species</i> No habitat within the study area is considered to be critical to the survival of the Pilotbird. <i>e. disrupt the breeding cycle of an important population</i> The proposed action and affected area are too small to disrupt the breeding cycle of a population of the Pilotbird. <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> The proposed action will not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the Pilotbird is likely to decline. <i>g. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat</i>

Matters to be addressed	Impact
	The proposed action will not result in invasive species that are harmful becoming established in habitat for the Pilotbird. <i>h. interferes substantially with the recovery of the species.</i> The proposal is too small to impact adversely on the recovery of the Pilotbird. It is likely that the species will continue to utilize the study area from time to time after the implementation of the action proposed.
(e) Any impact on a Commonwealth Endangered Ecological Community	No. The proposal will not impact any Commonwealth listed endangered ecological communities.
(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.



APPENDIX B

ABORIGINAL CULTURAL HERITAGE DUE DILLIGENCE ASSESSMENT

Aboriginal Cultural Heritage Due Diligence Assessment Section 44 Mountain Bike Trail, Thredbo



Report Prepared for Kosciuszko Thredbo Pty Ltd

Date: 10/06/2025

Document Control

Revision	Date	Author	Reviewed
V1	10/06/2025	N. Cracknell	L. O'Brien/Thredbo
V2	16/6/2025	L O'Brien	

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- ❖ Maps, Mapping Grid Reference Co-ordinates or images for Aboriginal heritage sites, places and objects.
- ❖ Location or detailed information regarding places of Aboriginal cultural significance, as expressed or directed by Representative Aboriginal Organisations, Aboriginal elders, or members of the wider Aboriginal community.
- ❖ Other culturally appropriate restricted information as advised by Aboriginal representatives and traditional knowledge holders.

Information in the report covered by the above categories should be redacted before being made available to the general public. This information should only be made available to those persons with a just and reasonable need for access.

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EXECUTIVE SUMMARY

Kosciuszko Thredbo Pty Ltd are seeking to construct a new mountain bike trail (Section 44) at the Thredbo Alpine Resort, located between the Kosciuszko Flow Trail, and the lower golf course ski run/access road. The project area is located within the larger Lot 876 DP1243112 and consists of the hillslopes to the south of the Kosciuszko Flow Trail and exits along the vehicle access track.

The study area is shown on Figure 1 in a regional context with details of the proposed works in Figure 2.

This Due Diligence heritage assessment has been undertaken in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010a).

The proposal would involve the following impacts:

- ❖ Clearing of vegetation to trail width
- ❖ Construction and maintenance of ground surface for use as a mountain biking trail, including earthworks, landscaping and the introduction of materials.
- ❖ Rehabilitation works

No heritage sites or areas of Potential Archaeological Deposit (PAD) were identified within the project area based on a review of previous reports and field survey of the project area.

Field survey was undertaken across the project area in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b). The field survey covered the majority of the proposed trail's alignment, where accessible, as well as the surrounding area. Ground visibility was generally low at the time of field survey with extensive vegetation coverage and few exposures, namely limited to erosion along the 4WD track. The field survey did not identify any heritage sites or areas of potential.

As a result of the field survey and background research completed for the project, the following recommendations have been developed:

- ❖ The development proposal should be able to proceed with no additional archaeological investigations. No areas of potential archaeological deposits or heritage sites have been identified within the development area and the potential for Aboriginal or historical heritage objects within the development area has been assessed as low.
- ❖ All Aboriginal objects are protected under the *NSW National Parks and Wildlife Act 1974*. It is an offence to disturb an Aboriginal site without a consent permit issued by NSW Heritage. Should any Aboriginal objects be encountered during works then works must cease and the find should not be moved until assessed by a qualified archaeologist.

- ❖ In the unlikely event that human remains are discovered during the construction, all work must cease. NSW Heritage, the local police and the appropriate Local Aboriginal Land Council (LALC) should be notified. Further assessment would be required to determine if the remains are Aboriginal or non-Aboriginal.
- ❖ Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation.

1 INTRODUCTION

Kosciuszko Thredbo Pty Ltd are seeking to construct a new mountain bike trail (Section 44) at the Thredbo Alpine Resort, located between the Kosciuszko Flow Trail, and the lower golf course ski run/access road. The project area is located within the larger Lot 876 DP1243112 and consists of the hillslopes to the south of the Kosciuszko Flow Trail and exits along the vehicle access track.

The study area is shown on Figure 1 in a regional context with details of the proposed works in Figure 2.

The proposal would involve the following impacts:

- ❖ Clearing of vegetation to trail width
- ❖ Construction and maintenance of ground surface for use as a mountain biking trail, including earthworks, landscaping and the introduction of materials.
- ❖ Rehabilitation works

These works are high impact and would have a negative impact on any heritage located within the project boundary. Heritage sites may be located on the surface or subsurface in areas of high potential for the preservation of archaeological remains of historical events or past usage by Aboriginal groups.

To assess the potential impacts of the proposed works on heritage this Due Diligence Heritage Assessment has been undertaken.

This report, field survey and associated research has been conducted in accordance to the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (OEH 2010).

1.1 PROJECT OBJECTIVES

The due diligence assessment is being undertaken to complete the following objectives:

1. Review of the NSW Heritage Aboriginal Heritage Information Management System (AHIMS), to identify any recorded Aboriginal heritage sites within the project area.
2. Review of historic registers to identify any historic heritage.
3. Review of previous reports in area to develop predictive model of site location
4. Assess landforms present in project area against predictive model to determine potential for heritage sites and determine level of disturbance
5. Complete site visit to visually inspect impact areas or areas assessed as holding potential based on predictive model and record any identified heritage sites. The site visit will also document levels of disturbance within project area.
6. Complete due diligence report with management recommendations to avoid or minimise impacts within the project area.

1.2 ABORIGINAL CONSULTATION

Due to the limited scope of the proposed works, and no previously recorded sites recorded in the vicinity, no consultation with the local Aboriginal community has been undertaken. Consultation with the Aboriginal community is not a requirement of the Due Diligence Code of assessment, which is undertaken at the preliminary planning stage of the project.

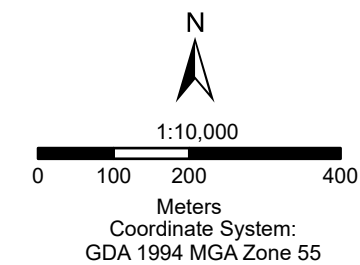
If the assessment finds that impacts to Aboriginal heritage will occur as a result of the development then consultation will be undertaken with the Local Aboriginal Land Council (LALC) and the wider Aboriginal community, in accordance with the consultation guidelines required by NSW Heritage.



Figure 1: Regional Context

Legend

-  Watercourse
-  Section 44 Mountain Bike Trail
-  Major Road



Imagery: © NSW Spatial Services

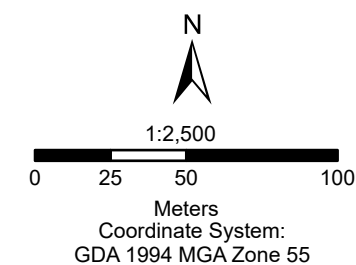
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Figure 2: Project Area

Legend

-  Contour -2m
-  Watercourse
-  Minor Road
-  Track
-  Path
-  Section 44 Mountain Bike Trail
-  Cadastre



Imagery: © NSW Spatial Services

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2 DESKTOP ASSESSMENT RESULTS

2.1 HISTORICAL HERITAGE SEARCH

Within NSW Local government is responsible for managing heritage items. This responsibility is mainly fulfilled by listing heritage items in the Local Environmental Plans (LEPs) under the *Environmental Planning & Assessment Act 1979*. Council approval is required to impact any listed item.

Heritage items can also be of 'state significance' in which case they are listed on the NSW Heritage Register by the NSW Heritage Council under the *Heritage Act 1977*. These items are usually substantial and consist of buildings, bridges or other structures that represent events in the local area.

A search of the NSW Heritage Register and the Snowy River LEP 2013 was undertaken for the project. No historical items were located during these searches. A review of historical parish maps was also undertaken with no known structures or items identified within the project area.

2.2 PREVIOUS HERITAGE STUDIES

An extensive number of heritage studies have been undertaken in the immediate area of the Thredbo Valley. These have been mainly small scale and development focused. Studies covering a larger area and generating models of occupation have been undertaken in the Perisher Valley (NOHC 2000) and Thredbo (Ironbark 2013). A review of this large body of work has been undertaken to provide context and site location modelling for the project area. The most relevant reports for the current project are summarised below from this large body of work.

Geering (1983) undertook field survey and assessment of the Bullocks Flat area for the Skitube development. The assessment recorded twelve isolated artefacts and three artefact scatters. Paton (1984) completed a further assessment including excavation of test pits in areas of high potential and in areas based on modelling considered to hold low potential, such as steeper slopes. None of the test pits revealed any artefacts and Paton concluded that the modelling based on areas of level ground near creek lines (Flood 1980) was correct in this location.

Paton (1985) completed a survey along the Thredbo River valley between the Ranger Station and Dead Horse Gap for the Alpine Way upgrade. This survey covered a range of differing landforms located on site on area of level ground amongst spur line. A locational model of site location on level areas was theorised.

Walkington (1988) completed a survey for a proposed 33kV powerline from Bullocks Flat to Thredbo identifying 11 artefact scatters and two isolated finds. Almost all of the sites found were situated on gently sloping ground such as spurs elevated above the river.

Paton (1988) surveyed the Thredbo Valley for a fibre optic cable route again crossing differing topographies in the area. Paton located a further two site during this assessment which supported his earlier location model.

Fuller (1988) completed a survey of the proposed development areas in Thredbo Village recording seven archaeological sites all consisting of isolated finds or small artefact scatters. The sites were located on level areas on basal and midslopes. Fuller concludes that all of the sites are typical of high-altitude sites in being low-density artefact scatters (1988:7).

Navin and Officer completed two surveys of the Thredbo valley, one for the Alpine Way in 1992 and the other for the Thredbo Alpine Village in 1994. A number of small sites were located, conforming to the site models being isolated finds or small artefact scatters located on level areas or gradual slopes within basal contexts.

Dearling (1997) surveyed a 2-hectare area, for a proposed ski run at Thredbo. He located one site (#61-6-103), which consisted of five artefacts. It was situated on a cleared service road on the crest of a spur in a minor saddle with Merritt's Creek to the south and an unnamed creek to the north. The level location and proximity to creek lines again conform to the modelling for the region. This site is the closest to the current project area but well outside of any area of impact.

NOHC in 2000 completed a large scale and extensive field surveys and subsurface testing of landforms for the Perisher Blue Ski Resort. This study resulted in the development of a site location model which is equally applicable to the Thredbo region as similar topography and landscape features are present. Navin Officer Heritage Consultants concluded that the strongest site determinants were:

- Relatively level, well drained ground
- Shelter from prevailing weather patterns (mainly from the west and northwest)
- Avoidance of cold air drainage contexts
- Preference for terrain which facilitates pedestrian access and through travel
- Proximity to exploitable resources such as open woodland, grassland and herb fields and Bogong moth aestivation sites (2000:41).
- Majority of sites would be small artefact scatters of less than 15 artefacts, found throughout landscape
- Larger sites (minority) would be located on crests of ridges and major spur lines or more commonly on basal valley slopes. The larger sites decreased in artefact density the higher the location from the basal slopes (NOHC 2000:41).

Dibden (2003) completed a survey of proposed upgrade works for Antons and Spennars T-bars at Thredbo. No sites were found, due to previous disturbance from clearing, land modification for grooming of ski slopes and the fact that the study corridor was located on steep, mid to upper slopes with low archaeological potential (2003:1).

Aecom (Formerly HLA) throughout 2004 and 2005 completed a series of survey and excavations for a proposed works depot at Friday Flat, located on level basal slopes and within a recorded site location (NOHC 1992). The excavations were placed in six differing locations and recovered 99 artefacts.

Grinsbergs (2008) completed a survey for the proposed multi-use trail from Bullocks Flat to Thredbo along the Thredbo Valley floor, which identified 21 sites, comprising 11 artefact scatters, nine isolated artefacts and a grinding groove as well as two areas of potential archaeological deposit. Based on the site locations Grinsbergs concludes that general model of site location with sites on level areas in basal contexts and not located on slopes was applicable.

Ironbark Heritage (2013) completed a due diligence assessment for the Thredbo Mountain Bike Trails which included the development of a GIS Slope analysis model. This assessment showed slopes of more than 10 degrees as not being conducive to Aboriginal usage and holding low potential for sites and subsurface deposits. This study included the current project area through which the trail passes.

NGH (2017) completed an Aboriginal heritage due diligence assessment for the Thredbo Mountain Bike Trails covering three new trail locations. The terrain features within the project area were mostly steep slopes, with few potential areas of sensitive landforms. No sites or areas of potential were identified, and the study concluded that the potential for the presence of Aboriginal sites is low due to the level of disturbance associated with previous ski slope work and the general steepness of the terrain.

Past Traces Pty Ltd (2018) completed three heritage assessment for the Thredbo Alpine Resort in regard to the upgrade and redevelopment of the Merritt's Mountain House Restaurant Thredbo NSW, the extension of visitor car park facilities at Friday Flat at Thredbo and the demolition and construction of a new building complex (retail/hospitality) on the site of the Thredboland building. All these three assessments did not locate any Aboriginal heritage sites or areas of Potential Archaeological Deposit (PAD) within the area.

OzArk (2021) completed the regional assessment of the Snowy Mountains Special Activation Precinct (SAP). The assessment area covered 72,211ha of which 330 were surveyed. One of these areas at Thredbo included the eastern portion of the current project area. No sites were identified with a general ranking of low potential based on gradient with moderate to high areas mapped on the eastern end on the flatter river flats close to Thredbo River. These areas will not be impacted by the current works.

Past Traces in 2023 conducted an assessment for the proposed upgrade to the Snowgums Chairlift to provide increased capacity and quality infrastructure. The project area was located predominately within the existing impacted Snowgums Chairlift corridor, at Thredbo, NSW on steep slopes. Based on the models of site location the areas were classified as low potential and this assessment did not identify any new heritage sites or areas of PAD.

In 2024, Past Traces undertook a cultural heritage assessment for the proposed rehabilitation of the Thredbo Sewer Trunk Main, located within the Thredbo Village. The field survey covered the pipeline alignment, with particular focus on the trees listed for removal and the degree of previous disturbance. Despite high ground surface visibility at the time, the field survey identified no Aboriginal heritage sites or areas of potential due to the steepness of the landforms, located on low potential landforms and the high degree of previous impacts along the pipeline route.

2.2.1 Predictive Model

The following predictive model has been developed for the project area (Table 1). The project impact area is limited in size and confined to low slope creek flats.

This site prediction model is based on:

- ❖ Site distribution in relation to landscape features within the project area
- ❖ Consideration of site type and densities likely to be present within the project area
- ❖ Slope gradients based on Ironbark (2013) and NOHC (2000).

Table 1. Site Prediction Model

Probability	Site Type	Definition	Typical Landform	Assessment
Low	Isolated finds and surface scatters of stone artefacts	Stone artefacts ranging from single artefact to high numbers	Most likely in proximity to creek lines and river flats	Project area is located on moderate gradient slopes with previously landscaping undertaken along 4WD alignment.
Low	Potential Archaeological Deposits (PADs)	Area considered on landform to hold higher potential for unidentified subsurface deposits	Varies, but most frequent on elevated terraces along creek lines and river frontage.	Project area is located on moderate gradient slopes with previously landscaping undertaken along 4WD alignment.
Nil	Culturally Modified Trees (CMTs)	Trees which have been modified by scarring, marking or branch twining	Wherever old remnant trees remain	Alpine species not applicable.
Nil	Rock Engravings	Images engraved on flat rock surfaces	Escarpments, rock platforms or rock shelters	Not present
Nil	Stone arrangements	Arrangements of stones by human intention, including circles lines or patterns.	Any landform	High levels of previous impact None are previously recorded.
Nil	Stone quarries/Ochre sources	Quarry sites where resources have been mined.	Any landform	Not present based on geology.
Nil	Axe grinding grooves	Grooves in stone caused by the grinding of stone axes	Usually in creek lines, as water is used as abrasive with sand.	None previously recorded.
Nil	Burials	Burials of Aboriginal persons	Usually requiring deep sandy soils on eastern facing slopes	Relevant soils not present. None previously recorded.

2.3 ABORIGINAL HERITAGE INFORMATION MANAGEMENT SYSTEM (AHIMS) SEARCH

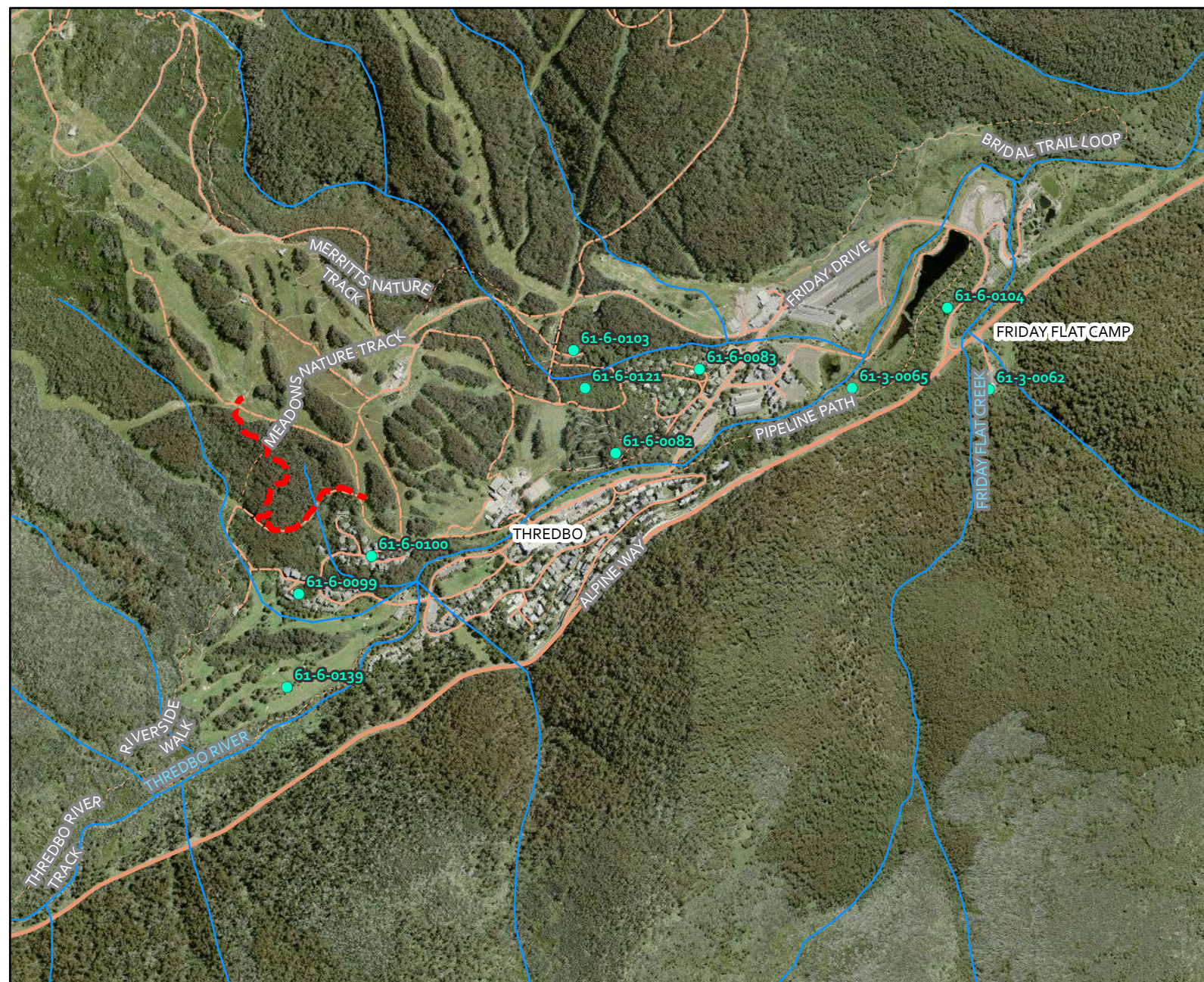
A search of the NSW Heritage AHIMS database was undertaken on the 20/5/2025 covering the approximate 1km surrounding area centred on the project area. The extensive search revealed previously recorded heritage sites (n=22) within the surrounding 1km. No previous heritage sites have been located within the Project Area.

The sites located in this 1km area are provided in Table 1 and consist of isolated finds, artefact scatters, and one area of PAD and conform to the wider site predictive model for the Thredbo Valley/Kosciusko area (NOHC 2000, Grinsbergs 2008, Ironbark 2013, OzArk 2021). This model predicts a site location model of small sites located on level ground in proximity to water sources, or on level areas of spur lines, saddles and ridge crests amongst mountainous areas. This predictive model is discussed in more detail in Section 2.2. The location of previously recorded sites within 1km of the project area are shown in Figure 3.

Table 2. AHIMS Site Types

Site Type	Number	Percentage
Isolated find	3	14%
Open camp site	18	82%
PAD	1	5%

Figure 3: Previously Recorded Heritage Sites



Legend

-  Watercourse
-  Previously Recorded Site
-  Section 44 Mountain Bike Trail
-  Primary Road
-  Major Road
-  Minor Road
-  Track
-  Path

1:15,000
 0 0.2 0.4 0.8
 Kilometers
 Coordinate System:
 GDA 1994 MGA Zone 55

Imagery: © NSW Spatial Services

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2.4 LANDFORM AND DISTURBANCE LEVEL ASSESSMENT

The project area consists of moderate gradient amorphous terrain descending from upper slopes to lower slopes. Based on the predictive model developed by Ironbark (2013) these slopes hold low potential for Aboriginal heritage sites. A large portion of the proposed track locations are heavily disturbed from previous, landscaping and ongoing use of the access track and intersection with the Meadows Nature Track. This high level of disturbance further reduces heritage potential. The remaining sections of the proposed Section 44 Track are located within dense eucalypt scrub, which appears to have little previous impact but are within moderate to steep gradient slopes.

Review of topographic maps and aerial photography show a high level of impact along the existing trails consisting of vegetation clearance, vehicle tracks and ongoing maintenance. In summary, based on the desktop assessment, the project area is considered to hold low potential for heritage sites. Previous assessments by Ironbark (2013) for the surrounding mountain bike trails did not identify any areas of PAD or heritage sites recorded within the wider project area. Confirmation of this finding of low potential and high impact are the main aims of the visual inspection (field survey) of the project area detailed in the following section.

3 FIELD SURVEY RESULTS

A field survey of the project area was undertaken on the 29th May 2025 to verify the findings of the desktop review of landforms and disturbance. The aim of the investigation was to identify heritage objects or places of potential archaeological Deposit (PAD). Based upon the background research, known Aboriginal site patterning, and current aerial photography, the majority of the proposed Section 44 track and surrounding landforms were inspected.

All surveyed areas and items of interest were recorded on a topographic map of the study area (using a GPS and GDA94 MGA55 coordinates), along with levels of visibility, erosion, soil conditions, and evidence of land disturbance.

Ground surface visibility (GSV) is the percentage of ground surface that is visible during the field inspection. GSV increases in areas of exposures such as stock impact trails, roads, gates and along areas of erosion such as creek banks and dam walls. As a result surveys undertaken in areas with high exposure rates result in a more effective survey coverage.

The site visit resulted in the following findings.

3.1.1 Ground Surface Visibility

GSV over most of the study area was very low due to dense vegetation and leaf litter coverage across the majority of the proposed track's alignment. Bare earth was visible in erosional exposures and across the project area the average GSV was estimated at <10%. Due to the prevailing vegetation, areas of exposure were infrequent and limited to the 4WD, the intersection with Meadows Nature Track and the northern ski slope.

The conditions at the time of the field survey are shown in plates 1 to 8.



Plate 1. Southern length of trail along access track (facing west)



Plate 2. Alignment along access track with dense vegetation along proposed track, heavily cut into slope (east)



Plate 3. Eroded exposures along access track (northwest)



Plate 4. Location where proposed track deviates into dense scrub (north)



Plate 5. Dense scrub along southern half of track with nil GSV (west)



Plate 6. Location of intersection between proposed trail and Meadows Nature Track (northwest)



Plate 7. Track alignment to north of Meadows Nature Track intersection (northeast)



Plate 8. Northern entrance of proposed track into dense scrub (south)

3.1.2 Disturbance

The degree of disturbance across the study area varied from low throughout the dense scrub sections of the alignment, and high disturbance along the access track and Meadows Nature Track portions of the alignment.

The areas of the proposed Section 44 mountain bike track within the dense scrub featured overall low levels of disturbance, however, were located within moderate gradient slopes assessed as holding low potential. The vegetation was dense and difficult to traverse with several large rock outcrops and boulders present.

The proposed Section 44 mountain bike track utilises a large portion of an existing access track and intersects the Meadows Nature Track, as well as connecting into the existing bike tracks located within the ski slope to the north. In these areas the overall disturbance was assessed as high due to extensive landscaping, introduced materials and ongoing use and maintenance.

The locations of the proposed works are not located on high potential landforms and these areas are considered to hold low potential for heritage sites due to the high levels of previous disturbance and overall gradient of the slope.

3.1.3 Results - Aboriginal Heritage Sites

No areas of Aboriginal heritage were identified during the field survey. No known heritage sites will be affected by the proposed development.

3.1.4 Results - Areas of Potential Archaeological Deposit (PAD)

Areas of PAD are defined as landforms that hold higher potential than their surrounds to contain subsurface deposits of past Aboriginal occupation. Based on a review of previous studies completed for the region, areas of PAD would be located in association with waterways (1st or 2nd order streams) on level ground or along spur crest and ridge lines.

As a result, of the landforms and prior impacts, no areas of PAD have been identified and the project area is considered to hold low potential.

3.1.5 Results – Historical Heritage

No areas or items of historical heritage were identified within the project area as a result of the background review or field survey.

3.1.6 Summary

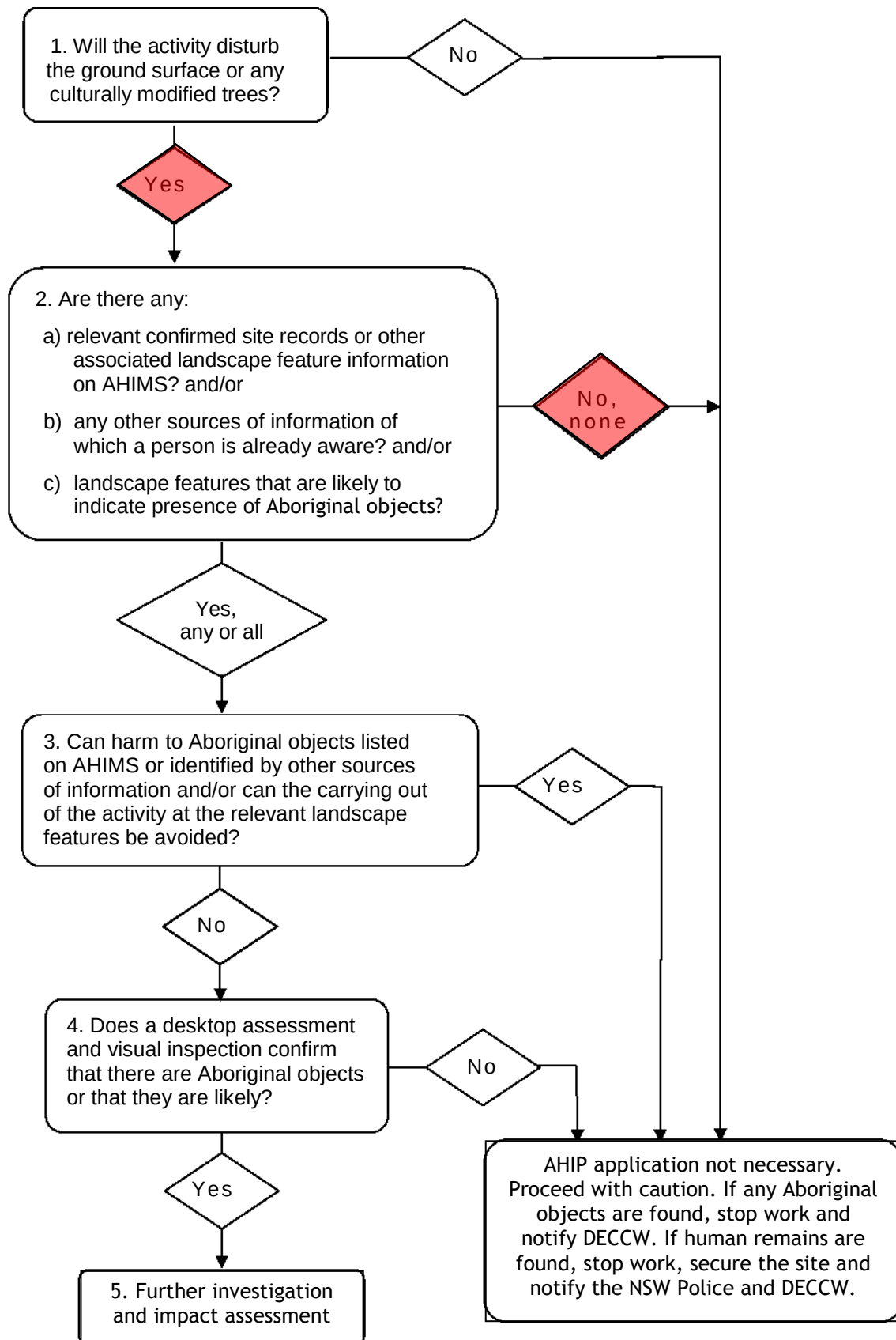
As a result of the site visit, field survey of impact areas and background research, it is considered that the project has low potential to impact on unrecorded Aboriginal or Historical heritage sites or areas of PAD. No Aboriginal heritage sites or areas of PAD were recorded or identified as a result of the assessment and no areas of high or moderate sensitivity are present in the development area based on previous research, modelling and the field survey assessment of disturbance and soils.

Based on the assessment the impacts from the project are as follows:

- ❖ No known Aboriginal objects or places will be impacted by the proposed works.
- ❖ No known Historical objects or places are present in the project area.
- ❖ No areas of high potential to contain unrecorded Aboriginal or historical objects or places are present in the project area.

The Aboriginal Due Diligence Code provides a flowchart of six questions to identify the presence of and potential harm to Aboriginal heritage. These questions and their applicability to the project are shown in Figure 4. The responses to these questions determine if further heritage investigations are required.

Figure 4. Due Diligence Flow Diagram (OEH 2010:10 – Due Diligence Code of Practice)



4 RECOMMENDATIONS

Based on this due diligence assessment the following actions are recommended for the project.

Recommendation 1: Works to proceed without further heritage assessment with caution.

The proposed works can proceed without further assessment as no Aboriginal or historical heritage sites (objects or places) have been identified within the project area. The potential for impacting on unrecorded heritage sites within the project area is assessed as extremely low, based on landform analysis and field survey.

Recommendation 2: Discovery of Unidentified Aboriginal cultural material during works.

Under the *NPW Act 1977* all Aboriginal places and objects are protected from harm, even if they have not been previously identified during the assessment process. If Aboriginal material is discovered during works then the steps as outlined below should be followed:

- ❖ All work must cease in the vicinity of the find and project manager notified immediately.
- ❖ A buffer zone of 10m should be fenced in all direction of the find and construction personnel made aware of the 'no go' zone.
- ❖ NSW Heritage must be notified of the find and advice sought on the proper steps to be undertaken.
- ❖ After confirmation with NSW Heritage a heritage consultation should be engaged to undertake assessment of the find and provide appropriate management recommendations to the proponent.

Recommendation 3: Discovery of Human Remains

In the highly unlikely event that human remains are discovered during any construction work, than all activity in the vicinity of the find must cease. As a first step the local police must be notified, followed by NSW Heritage and advice sought on appropriate next actions. No work can continue on the site until cleared with police and NSW Heritage.

Recommendation 4: Alteration of impact footprint

Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation.

Implementation of the above management recommendations will result in low potential for the project to impact on heritage values or result in damage to heritage sites.

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A.1 AHIMS SITE SEARCH

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 2025-087

Client Service ID : 1006057

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
61-6-0100	Ramshead Creek 2; <u>Contact</u>	AGD	55	616290	5959060	Open site	Valid	Artefact : -	Open Camp Site	
61-3-0062	Alpine Way 7 <u>Contact</u>	AGD	55	617909	5959497	Open site	Valid	Artefact : -	Open Camp Site	2495,99160,99 161,99162,991 63,99164,9934 1,99487,99818, 103116
61-6-0083	Merritts Park, Site 1; <u>Contact</u>	AGD	55	617150	5959550	Open site	Valid	Artefact : -	Open Camp Site	1417
61-6-0121	Merritts Creek 1 <u>Contact</u>	AGD	55	616850	5959500	Open site	Valid	Artefact : -		
61-6-0104	Friday Flat 2 <u>Contact</u>	AGD	55	617800	5959710	Open site	Valid	Artefact : -	Isolated Find	99341
61-3-0065	Friday Flat IF-1;? <u>Contact</u>	AGD	55	617550	5959500	Open site	Valid	Artefact : -	Isolated Find	103116
61-6-0103	EDI 1 <u>Contact</u>	AGD	55	616820	5959600	Open site	Valid	Artefact : -	Open Camp Site	4447
61-6-0099	Ramshead Creek 1; <u>Contact</u>	AGD	55	616100	5958960	Open site	Valid	Artefact : -	Open Camp Site	668,675,1769
61-6-0082	Merritts Park Nature Trail;Site 1; <u>Contact</u>	AGD	55	616930	5959330	Open site	Valid	Artefact : -	Open Camp Site	1417
61-6-0139	TGC1 <u>Contact</u>	GDA	55	616182	5958901	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		

** Site Status

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 20/05/2025 for Lyn O'Brien for the following area at Lat, Long From : -36.5094, 148.2907 - Lat, Long To : -36.4921, 148.3216. Number of Aboriginal sites and Aboriginal objects found is 10

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.