Statement of Environmental Effects

Merritts Mountain Bike Trail and Associated Works

Thredbo Alpine Resort,
Kosciuszko National Park

December 2024

Document Control

Revision	Date	Revision Type	Author	Approved by
A	19.07.2024	Draft	J. Best; C. Chalk	K. Delpit
0	11.12.2024	Final	J. Best; C. Chalk	A.Harrigan

Project Number: 24011MO

Kosciuszko Thredbo Pty Ltd

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1 Introduction

This Statement of Environmental Effects (SEE) has been prepared to support the Development Application (DA) for the Merritts Mountain Bike Trail and Associated Works within Thredbo Alpine Resort (hereinafter referred to as the Development).

1.1 Application details

Table 1: Application details

Application Details	
Applicant	Kosciuszko Thredbo Pty Ltd (KT)
ABN	95 000 139 015
Applicant Address	1 Friday Drive, Thredbo NSW 2625
Development Address	Thredbo Alpine Resort, Kosciuszko National Park, 2 Friday Drive, Thredbo NSW 2625
Lot/Plan	876/DP1243112
Local Government Area (LGA)	Snowy Monaro Regional Council
Zoning	Zone C1 – National Parks and Nature Reserves
Planning Instrument	*State Environmental Planning Policy (Precincts – Regional)* 2021 (Precincts – Regional SEPP)
Integrated Development	Works are within waterfront land requiring assessment under the *Water Management Act 2000.*
Consent Authority	Department of Planning, Housing and Infrastructure
Type of Development	Recreational infrastructure (mountain bike trail)
Summary of works	• vegetation clearing • construction of mountain bike trail, including earthworks and installation of signage • installation of camera on Gunbarrel chairlift tower 12, including trenching for connection into existing services • construction of vehicle access track within the Gunbarrel chairlift corridor • rehabilitation works.

1.2 Supporting documentation

This application is supported by the documentation listed below.

Table 2: Supporting documentation

Document	Title/Description	Author/Prepared by	Date	Document Reference
Site Environmental Management Plan	Site Environmental Management Plan, Merritts Mountain Bike Trail and Associated Works	Kosciuszko Thredbo Pty Ltd	November 2024	Rev0
Site Plan	Site Plan, Proposed Intermediate Trail	Kosciuszko Thredbo Pty Ltd, BB	17/10/2024	Rev 5
Plan	Standard Signage Plan	Kosciuszko Thredbo Pty Ltd	11/12/2024	Rev 0
Report	Merritts Intermediate Mountain Bike Trail – Thredbo Alpine Resort – Flora and Fauna Assessment	Eco Logical Australia Pty Ltd	6/12/2024	Version 2
Report	Construction of Mountain Bike Trails Merritts Intermediate Trail & Associated Works Detailed Rehabilitation and Monitoring Plan	Kosciuszko Thredbo Pty Ltd	28/11/2024	Rev 0

2 Site description

2.1 Location

The Development site is located in Thredbo, within the southern part of KNP, approximately 35 km south-west of Jindabyne in the Snowy Monaro Regional Council LGA (refer **Figure 1**). Within the context of the resort, the Development site is generally located to the east and south of the Merritts Gondola top station (refer **Figure 2**).

2.2 Existing land uses

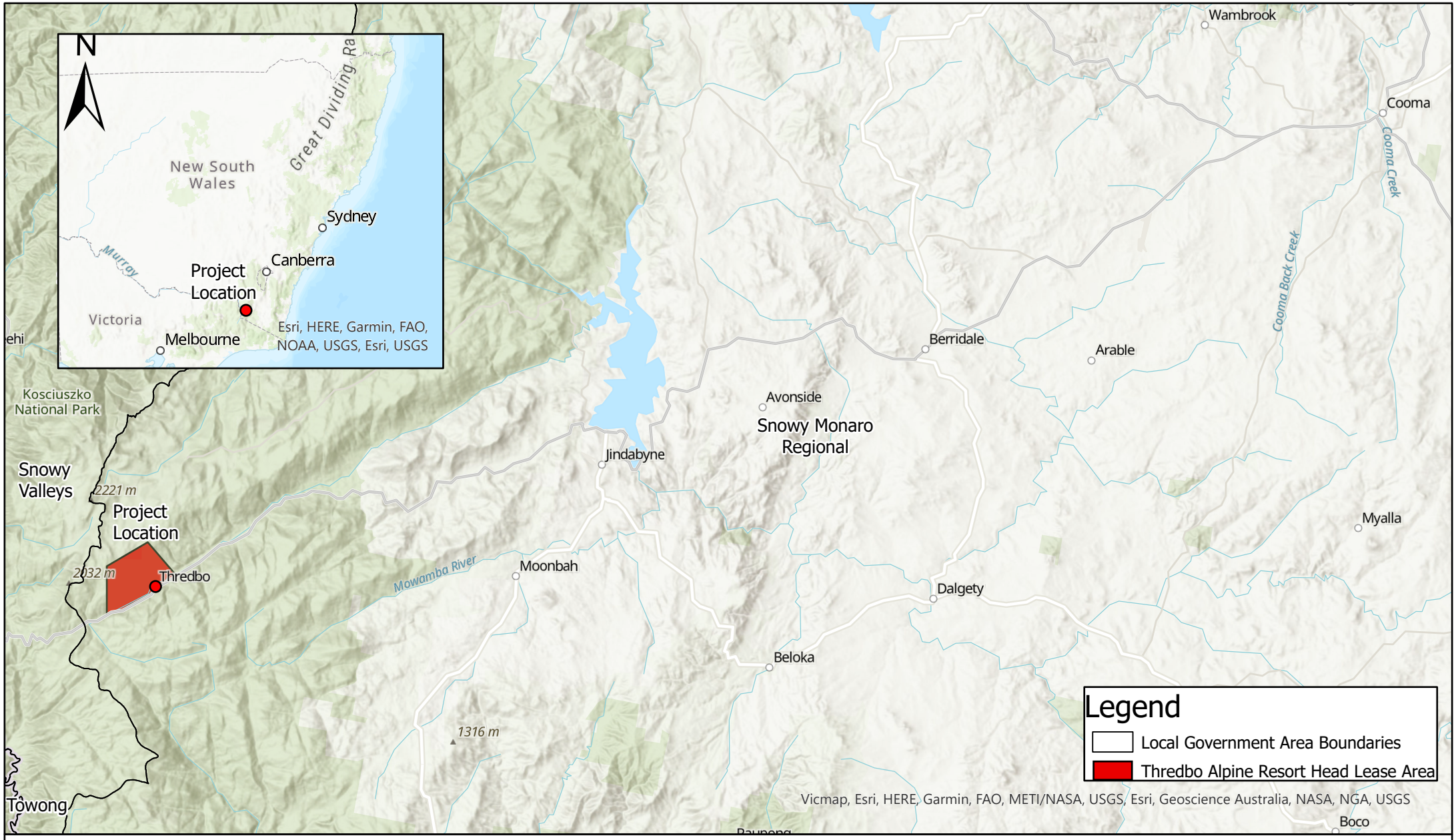
Surrounding land uses include MTB trails, lifting infrastructure, snowmaking infrastructure, ski runs, roads and access tracks.

2.3 Site suitability

The trail alignment traverses native vegetation and utilises existing mountain bike trails in the locality where suitable. The site is considered suitable for the trail as it is easily accessible, the terrain provides ideal features for an intermediate trail; and parts of the alignment will utilise existing trails and other disturbed areas.

The camera cable trench is located within the Gunbarrel lift corridor within a pre-existing offset area between Dream Run ski run and Tower 12. Alternatives to this location were considered, including adjacent to the existing lift corridor outside of the offset area but that alignment would have resulted in greater environmental impact to undisturbed native trees and understorey.

The vehicle access track is located within the Gunbarrel lift corridor within a predominately pre-disturbed area.



Scale: 1:305,832

3 1.5 0 3 6 9 12

Kilometers

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 55

N

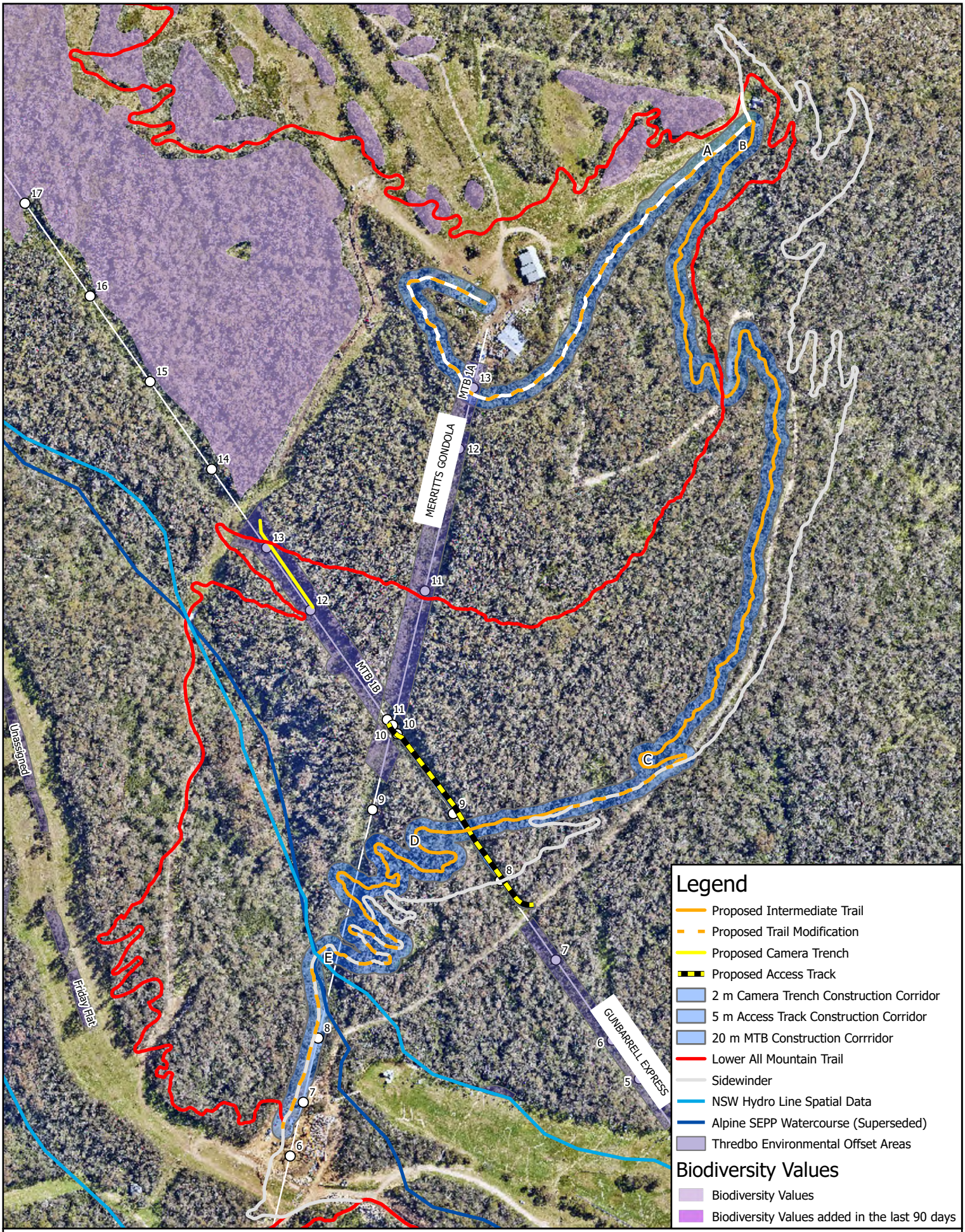
THREDBO

FIGURE 1: REGIONAL SITE CONTEXT

Revision: A

Date: 7/06/2022

Produced By: KO



Scale: 1:4,500

30 15 0 30 60 90 120

Meters

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

N

THREDBO

Site Plan

Project: Proposed Intermediate Trail

Revision: 6

Date: 28/11/2024

Produced By: BB/JB

3 Project description

3.1 Mountain bike trail

Thredbo's current trail network has generally been designed to accommodate the requirements for standard mountain bikes. The purpose of this Development is to create an inclusive intermediate mountain bike trail that can be utilised by a broader range of riders.

The trail will be designed to cater for both standard and adaptive mountain bikes. Adaptive mountain biking includes a range of riders who cannot ride a standard two-wheeled bikes and require adapted equipment and trails to suit their physical, intellectual, neurological and/or sensory abilities (BtB 2018). There are a number of considerations including trail width, turning radius, gradient, camber and limits on technical features to ensure the safety of adaptive riders.

One of KT's key trail design principles is 'trails for everyone'. Creating a new trail that caters to both standard and adaptive bikes will help to increase participation in the activity and improve the sense of inclusion at Thredbo.

3.1.1 Trail options analysis

A preliminary site assessment was undertaken by key Project personnel (i.e. Project Manager, MTB trail designers, Environmental Officer and adaptive rider) to identify potential constraints (e.g. ecological and construction) of the proposed trail alignment and to allow for appropriate controls to be incorporated into the design. During this stage, several walkthroughs of the proposed trail alignment were undertaken to ensure the trail objectives are met whilst minimising the impacts on the natural environment as much as practicable. Key considerations for the trail alignment and location included:

- Ensure trail is easily accessible – The trail head is accessible from Merritts Gondola top station. Guests are able to load their bikes at the bottom station, located at Valley Terminal.
- Using existing disturbed areas where possible – i.e. making modifications to existing trails within the locality instead of additional disturbance to native vegetation.
- Integration with the trail network – The trail head is located at the top of Merritts Gondola. The trail will terminate at the Gondola mid station, where a new beginner adaptive trail is proposed (subject to separate DA approval).
- Conserve riparian corridors – Minimise the amount of new disturbance within waterfront land and avoid new water crossings by utilising existing bridge which forms part of the existing Sidewinder trail.

On Thursday 4th April 2024, four (4) representatives from DPHI and three (3) representatives from NPWS inspected Development site with the Project team to review the trail alignment.

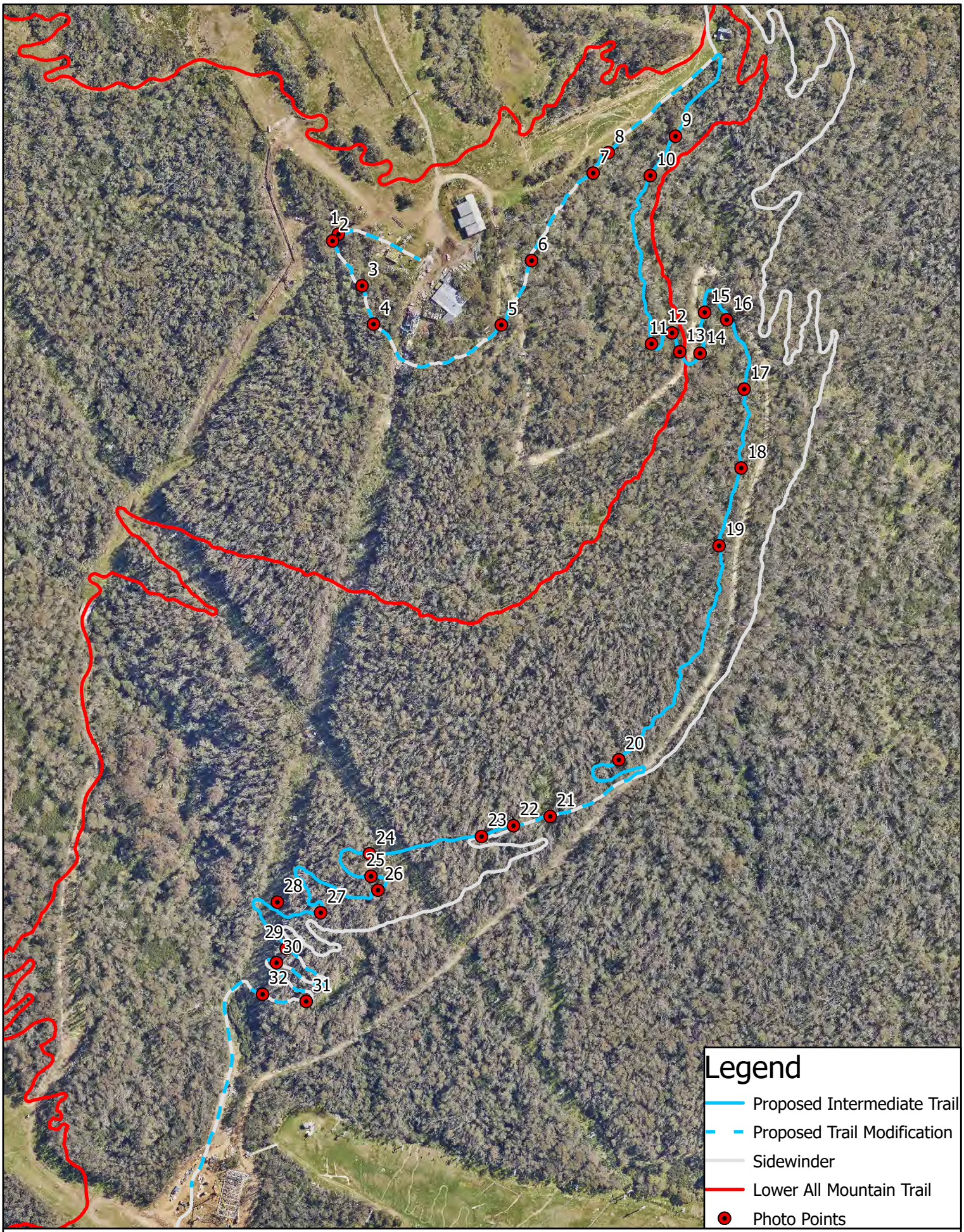
3.1.2 Trail overview

The trail starts at the top of Merritts Gondola and terminates at the Gondola mid station. From start to finish the trail drops in elevation from approximately 1,630 to 1,500 m AHD.

The start of the trail uses the Gondola Connect trail (approved under DA 21/11659). Modifications to the Gondola Connect trail (identified as section A on the Site Plan, **Figure 2**) will be required to cater for adaptive bikes. The trail then descends from nearby the Easy Rider T-bar bottom station where it crosses the summer mountain access road and existing Lower All-mountain trail.

The trail then descends through the native vegetation before it rejoins onto Sidewinder (approved under DA 10312). To enable riders access into the Gondola mid station, modifications to sections of Sidewinder trail (identified at sections C and E on the Site Plan, **Figure 2**) will be required to cater for adaptive bikes. No modifications to the bridge (watercourse crossing) on the lower section of Sidewinder is required. The trail will incorporate rolling contours, grade reversals, berms, jumps, and natural obstacles to create an interesting trail for users.

A description of the trail with photo point references is provided in **Figure 3** and **Table 3**.



Scale: 1:4,000

25 12.50 25 50 75 100

Meters

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

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THREDBO

SITE PLAN

Project: Proposed Intermediate Trail

Revision: 2

Date: 31/07/2024

Produced By: BB

Table 3: Site Photos and Trail Description

Photo Point ID / Description	Photo
PH1: The first section of the trail utilises the existing Gondola Connect trail which commences at the top of Merritts Gondola. Only minor trail works are proposed along this section of trail	
PH2: The trail utilises the existing berm on Gondola Connect.	
PH3: The trail heads south following the contours and grade reversals on Gondola Connect trail.	

Photo Point ID / Description	Photo
PH4: The trail heads east utilising the Gondola Connect trail before crossing the Merritts Gondola lift line. Very limited trail works required on the existing trail.	
PH5: The trail continues along the Gondola Connect trail before crossing the Merritts summer access road.	
PH6: The trail continues on the Gondola Connect trail following the contours and grade reversals.	

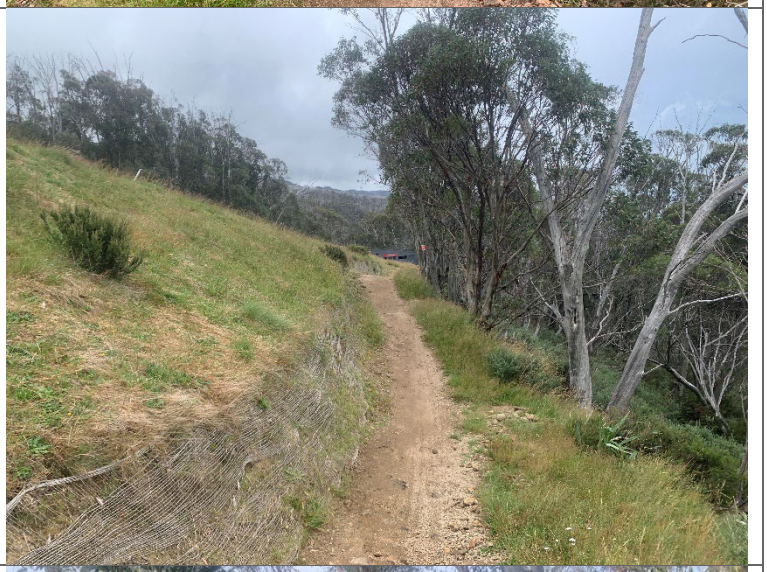
Photo Point ID / Description	Photo
PH7: The trail continues on the Gondola Connect trail heading northeast toward the Easy Rider t-bar bottom station.	
PH8: The trail continues along the edge of the ski run towards the Easy Rider t-bar bottom station before enting into the native vegetation.	
PH9: The trail follows the contours through the gaps in the trees.	

Photo Point ID / Description	Photo
PH10: The trail continues through the native vegetation following the contours of the slope.	
PH11: The trail descends into a series of switchbacks uphill of the Merritts summer access road	
PH12: The trail heads into a berm located within an open area amongst the trees.	

Photo Point ID / Description	Photo
PH13: The trail crosses the Merritts summer access road.	
PH14: The trail follows the contours of the slope adjacent to the Merritts summer access road.	
PH15: The trail heads into a berm within the shrubs adjacent to the Merritts summer access road.	

Photo Point ID / Description	Photo
PH16: The trail continues along native vegetation uphill of the Merritts summer access road.	
PH17: The trail continues to descend within the native vegetation adjacent to the Merritts summer access road.	
PH18: The trail continues through the native vegetation uphill of the Merritts summer access road.	

Photo Point ID / Description	Photo
PH19: The trail continues through the native vegetation.	
PH20: The trail continues west through the native vegetation into a berm before switching directions back towards the Merritts summer access road.	
PH21: The trail joins onto the existing Sidewinder trail. Minor trail works are required in this location.	

Photo Point ID / Description	Photo
PH22: The trail departs Sidewinder into the native vegetation uphill of the existing trail.	
PH23: The trail continues along the contours towards the Gunbarrel lift line	
PH24: The trail follows the contours heading west into a berm.	

Photo Point ID / Description	Photo
PH25: The trail departs the berm and heads east towards the Gunbarrel lift line.	
PH26: The trail exits the berm and heads west through the gaps in the trees.	
PH27: The trail incorporates a series of switchbacks through the native vegetation.	

Photo Point ID / Description	Photo
PH28: The trail exits the native vegetation into the cleared Merritts Gondola lift corridor.	
PH29: The trail departs the Merritts Gondola lift corridor and enters the native vegetation for a short section before re-joining Sidewinder.	
PH30: The trail utilises the Sidewinder trail. Trail modification is required in this location.	

Photo Point ID / Description	Photo
PH31: The trail utilises the existing berm on Sidewinder. Minor modifications are required.	
PH32: The trail utilises the existing Sidewinder trail where is crosses into waterfront land. No bridge modifications are required. The trail terminates at the Merritts Gondola mid station.	

3.1.3 Trail design and construction

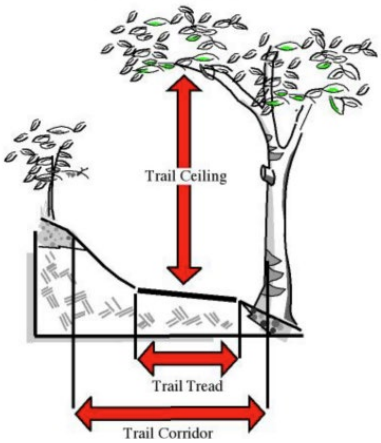
The design of trails is dependent upon various factors such as terrain (soil types, gradient of the land, natural features, vegetation etc.) safety of riders, user groups and style of trail (e.g. gravity, cross-country, adaptive). There are no fixed standards for designing and constructing trails. The following guidelines provide recommendations for trail design and construction that cater to a range of user groups, trail types and intended degree of difficulty:

- Kootenay Adaptive Trail Standards (KASA 2020)
- Australian *Adaptive Mountain Biking Guidelines, version 1.0.0* (Break the Boundary Inc. 2018)
- IMBA Guidelines
- Guidelines for trail planning, design and management: a toolkit for state and local government agencies, community groups and investors on how to plan, manage and market exceptional trail experiences (TRC Tourism 2015)
- Australian Mountain Bike Trail Guidelines (AusCycling 2019)

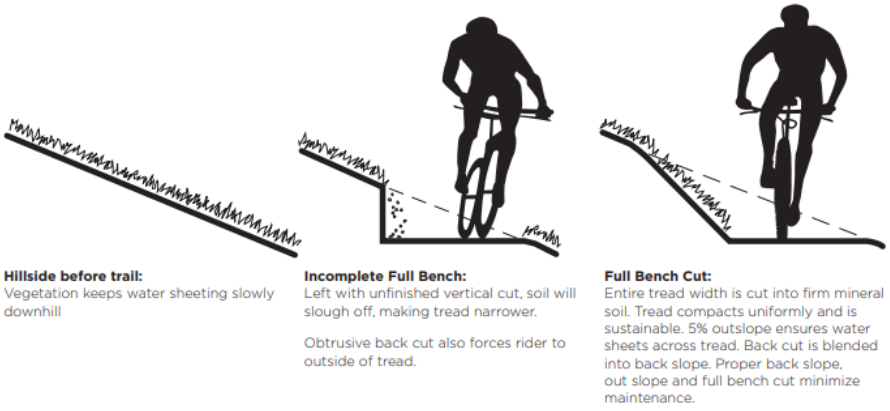
- Design principles applied to the construction of existing trails within the resort, including: trails for everyone, recreation versus competition, one-way trails, trail difficulty ratings, trail names and minimise environmental impacts.

A summary of key trail design and construction techniques is provided below.

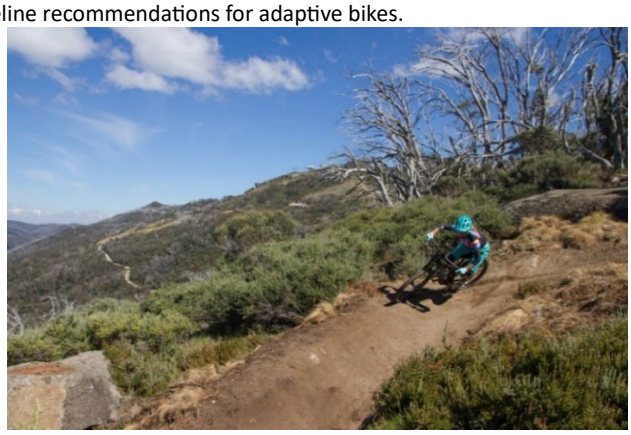
Table 4: Trail design and construction techniques

Element	Details
Trail tread	The tread refers to the actual surface of the trail upon which users travel. The width of the tread varies depending on the intended user, type of trail and proposed degree of difficulty. The Australian Adaptive Mountain Biking Guideline states "there are no hard-and-fast rules on how wide the trail should be in relation to the shoulder". BtB (2018) recommends "*the minimum width at any point of a trail (inclusive of tread and shoulders) that allows for a standard bike or pedestrian to overtake, should be no less than 1.5 m*". KASA 2020, recommends an average trail width of 1.8 m for a beginner trail (KASA, 2020) to allow sufficient clearance for adaptive bikes. The trail surface will be predominately natural soil, with local crushed granodiorite used where required.
Trail corridor	The trail corridor refers to the full dimensions of the trail, including the area on either side of the tread and the space overhead that needs to be cleared of brush and obstacles. IMBA suggests the trail corridor is generally double the width of the tread, dependent upon the slope. The greater the slope, the wider the corridor due to the extent of the upper and lower batters.  *Example of trail corridor (Source: IMBA)*
Trail type	One-way (descending) – This design component is a key risk management technique to minimise the likelihood of head-on collisions between riders.
Natural Obstacles and Technical Trail Features (TTFs)	The trail will incorporate TTFs (e.g. log roll, rock, stump or small mound).
Trail gradient	Trail gradient to consider guideline recommendations applicable to the site, considering the landscape and topography.
Trail signage	Trail signage is installed to clearly mark the trail, inform users of their responsibilities, aid in navigation and provide key information. Coordinated directional signage will be installed at relevant locations to direct riders from key public areas to the trail head. Generally, trail signage includes: *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

Element	Details
	• trail type e.g. flow • trail user type e.g. bikes only, no walkers, adaptive bikes • trail network logo.  *Example of decision point sign* *Waymarkers* Waymarkers include symbols to guide trail users in the correct direction at points along the trail e.g. where a trail crosses a road or access track, where a new trail branches off from another trail, to signify the wrong direction of travel. Waymarker signs are generally 100 mm x 100 mm x 1200 mm high.  *Example of Waymarker* Adaptive signage will be incorporated into network signage.  *Example of adaptive signage*
Follow the contours	The trail should be built on a side slope, aligned along the contours of the hillside. The most sustainable trails are those that have a low overall grade and frequent undulations, which will ensure water flows across and not along the trail.

Element	Details
Partial or full bench-cut construction	Trails built on sloping ground require excavation to achieve a partial or full bench construction. 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 in which it must be supported by a retaining wall. 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.  *Example of benching (Source: IMBA 2001)*
Outslope	A method of tread construction that leaves the outside edge of a hillside trail lower than the inside, in order to shed water in sheet flow. It is noted that completely outsloping trails will not provide enjoyable and safe trails. Camber design to consider recommendations for adaptive bikes.  *Example of outsloping on trail*
Rock armouring	Rock armouring is used to harden the trail to create an elevated trail tread above wet or soft terrain and to harden the trail tread against potential erosion from trail users.  *Example of rock armouring*

Element	Details
Drainage	Drainage crossings are a critical element of trail design and construction in areas which may have the greatest impact on water quality and the site where water has the greatest potential to damage the trail. Where minor drainage crossings are required, low level platforms will be constructed, similar to the structures used on the All-Mountain Trail and Friday Flat Loop, which have been constructed from steel frames with fibre-glass mesh on top. Drainage crossings will be low profile and located close to the ground, and therefore handrails are unlikely required. However, if handrails are required, the steel posts will be pile driven (to refusal) for each section of the fibreglass mesh tread and bearers be installed with the fibreglass mesh on top.  *Example of drainage crossings*
Half rule	Guidelines suggest a trail's grade should not exceed half the grade of the sideslope (e.g. if the gradient of the side slope is 20 %, the maximum allowable trail gradient would be 10 %). This will assist the sheeting of water across the trail.  *Example of half rule*
10 % rule – average trail grade guideline	Generally, an average trail grade of 10 % or less is the most sustainable (IMBA 2012).
Grade reversals	A grade reversal is where the trail has to be briefly reversed (i.e. a climb briefly goes down, or a descent briefly goes up) to help divert water off the trail. Grade reversals are also beneficial before and after steep sections, with smooth transitions between different grades (TRC Tourism 2015).

Element	Details
	 *Example of grade reversals*
Berms	A bermed corner has a banked outer edge that runs the entire length of the corner, allowing the rider to maintain a faster speed. Berms improve trail flow and reduce soil movement on corners. Berms help riders maintain speed without sliding out of the turn. Berms in conjunction with effective grade reversals provide effective drainage outlets. Berm design to consider guideline recommendations for adaptive bikes.  *Example of berm*
Trail demarcation and anchors	Marking trail boundaries with rocks or vegetation to discourage users from cutting corners or from the desired path. Trail users will often cut corners through turns or around technical trail features. This can negatively affect the sustainability of a trail. Demarcation or anchors are a subtle way of keeping riders on the intended line. This is achieved by placing natural elements such as existing vegetation, rocks, logs or other natural landform or onsite materials. Strategically selected and placed demarcations or anchors prevent trail widening and can offer a more advanced features for more experienced riders (AusCycling 2019). This technique is only possible in vegetated areas and not on disturbed ski runs as no natural anchors or demarcation is available.
Trail flow	Correct trail flow manages the riders speed and momentum through trail design and construction. Consistent flow can minimise soil disturbance and displacement by reducing the need for users to exert more downwards or sideways force to stay on the trail. The goal of this element of trail design is to avoid abrupt changes and corners that are likely to make riders brake excessively or skid, which can result in braking bumps and trail widening.

3.2 Gunbarrel lift camera

The Development will include the installation of a camera on Gunbarrel lift tower 12 and installation of an underground cable between an existing communications pit on Dream Run that connects to the camera on tower 12. The camera is a safety requirement for the lift operation as it will allow operators to view chair activity along this section of the alignment and inform lift closures from high

wind events. The installation of this monitoring camera is a recommendation from an improvement notice issued by NSW SafeWork.

Figure 4: Proposed Gunbarrel lift camera pit location

The proposed cable alignment is located within the Stage 1B MTB Trails offset area. The requirements of the offset area include a management regime that precludes the routine maintenance activity of slashing the health vegetation on a bi-annual basis. The aim of the management regime is outlined below:

> The aim of the new management regime is to allow for native vegetation grow and recruit within this area to an approximate height of 500mm. The height of the vegetation in the area will be managed by cutting the vegetation using a combination of hand-held scrub cutters as and when required to maintain the 500mm height. This height has been determined to be the best compromise between operational requirements (they are located underneath a chairlift where pedestrian access may be required from time to time) and the requirement to allow cover for any fauna traversing the site.
>
> There are no plans to include any proposed planting in this area and to simply let the area naturally recruit.
>
> *Rehabilitation and Environmental Offsets Plan* *Page 4*

The trench disturbance will be approximately 30 m^2 (100m long x 300 mm wide) requiring the removal of some shrubs and groundcover. The trench will be dug with a 1.7t excavator with rubber tracks.

Alternatives to the preferred installation method were considered, including:

- Fixing the cable overhead to the lift infrastructure. This was discounted due to –
    - The Gunbarrel lift towers are not rated for overhead cables, especially for a single span only (i.e. for T13 to T12)
    - Overhead cable installation does not meet the Doppelmayr lift OEM's approval
- Trenching adjacent to the lift corridor which would predominately be outside of the offset area but would require the removal of a number of mature trees and understorey. This alternative would result in a greater environmental impact.

Following installation of the cable, the trench alignment will be rehabilitated with the following nominated species, including a mix of grasses, ground covers and shrubs. These species have been selected from the Gunbarrel offset area species list.

- *Coronidium scorpioides* (Button everlasting)
- *Acaena novae-zelandiae* (Bidgee widgee)
- *Olearia phlogopappa* (Dusty Daisy Bush)
- *Olearia megalophylla* (Large Leaf Daisy Bush)
- Ozothamnus secundiflorus (Cascade Everlasting)
- *Poa fawcettiae Vickery* (Smooth Blue Snowgrass)

Figure 5: Extract from Stage 1B Rehabilitation and Environmental Offset Plan (December 2015)

3.3 Vehicle access track

Modifications to the existing access track within the Gunbarrel lift corridor is proposed to allow for safer lift maintenance access and extraction of bike riders on trails in the locality. The track runs from Merritts summer access road, up the Gunbarrel lift corridor to the cross-over with Merritts Gondola as shown on the Site Plan (**Figure 2**). The track will be surfaced with decomposed granite and road base.

Figure 6: Vehicle access track alignment off Mountain summer access road

Figure 7: Vehicle access track below Gunbarrel chairlift (facing uphill)

3.4 Disturbance

A summary of the disturbance is provided below.

Trail length	Approximately 1495 m.
Trail tread	The average trail tread will be 1.5 m wide to account for adaptive rider considerations.

Trail corridor	The average trail corridor is 3 m wide, and up to 4 m to allow for negotiating large obstacles such as tree roots, which are not suitable for adaptive bikes. The trail construction corridor will be 10 m either side of the approved alignment. The flexible construction corridor is to enable trail builders to respond to any unforeseen circumstances that may occur on site particularly in relation to environmental constraints where it may be more appropriate to go around an object rather than remove it, and to allow greater flexibility to meet relevant adaptive trail design requirements.
Gunbarrel lift camera trench	The trench will be approximately 300 mm wide, with a 2 m construction corridor.
Vehicle access track	The formed access track will be approximately 2.5 m wide. A 5 m construction corridor is to enable batters and stabilisation works, and enable builders to respond to any unforeseen circumstances that may occur on site particularly in relation to environmental constraints where it may be more appropriate to go around an object rather than remove it.
Initial disturbance to native vegetation	Approximately 0.88 ha refer to the Flora and Fauna Assessment (ELA 2024) provided in **Appendix B** for details.

3.5 Project timing

Construction is planned for the 2024/25 summer construction period.

3.6 Operational details

The opening of the trail is planned for the 2025/26 mountain bike season. The trail will be operational during the Thredbo Mountain biking season (generally end of November to end of April each year).

During operation, ongoing monitoring and maintenance of the trail is critical to ensure effective and sustainable trail management. A maintenance and monitoring program will be implemented as part of the overarching *Thredbo Mountain Bike Trail Management Plan*. The plan sets out the management requirements and guides the maintenance works required to sustainably manage the Thredbo MTB Trail Network, as well as the monitoring and reporting requirements to effectively monitor the environmental condition of trails and their impact on the surrounding environment.

4 Legislation and statutory framework

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage nationally and internationally important aspects of the Australian environment. The EPBC Act is administered by the Department of Climate Change, Energy, the Environment and Water (DCCEEW). Under Part 3 of the EPBC Act, a person must not undertake an action (e.g. a development) that will have, or is likely to have, a significant impact on a protected matter (MNES), without approval from the Australian Government Minister for the Environment.

MNES that may occur or relate to the search area (within a 5 km search buffer) are provided in the EPBC Act Protected Matters Report within the appendices. A summary of the PMR and potential impacts is provided below.

Table 5: Summary of MNES

Matters of National Environmental Significance	Comment
World Heritage Properties	Not applicable.
National Heritage Places	No impacts proposed.
Wetlands of International Importance	No impacts proposed.
Great Barrier Reef Marine Park	Not applicable.
Commonwealth Marine Area	Not applicable.
Listed Threatened Ecological Communities	The Flora and Fauna Assessment (ELA 2024) concluded the Development is unlikely to result in any significant impacts to MNES.
Listed Threatened Species	
Listed Migratory Species	

Following consideration of the MNES Significant Impact Guidelines it is concluded that the Development is unlikely to have a significant impact on any MNES or Commonwealth land, and a referral to the Commonwealth Environment Minister is therefore not recommended.

4.2 State legislation

4.2.1 Environmental Planning and Assessment Act 1979

A review of the Development against the *Environmental Planning and Assessment Act 1979* (EP&A Act) is provided below.

Table 6: EP&A Act matters for consideration

Environmental Planning and Assessment Act 1979	
Section 4.15 – matters for consideration	
(i) any environmental planning instrument	The Precincts – Regional SEPP is the only environmental planning instrument which applies to the site for this proposal. Refer to assessment in the next section.
(ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved)	Not applicable. There are no draft Environmental Planning Instruments that are applicable to the Development.
(iii) any development control plan	Not applicable. There are currently no development control plans applicable to the site.
(iiia) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4	Not applicable. There are no planning agreements applicable to Thredbo under the Precincts – Regional SEPP.
(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph)	The DA and supporting information have been prepared in accordance with the relevant requirements of the EP&A Regulation.
(a) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality	The likely impacts of the Development on the natural and built environment, and social and economic impacts in the locality have been assessed in this document.
(b) the suitability of the site for the development	The site suitability has been addressed in this document.
(c) any submissions made in accordance with this Act or the regulations	Consideration will be given to submissions made.
(d) the public interest.	The Development is considered within the public interest as the new trail aims to increase participation in mountain biking and improve the sense of inclusion at

	Thredbo. The lift camera and vehicle access track will support ongoing resort operations and lift safety.

4.2.2 State Environmental Planning Policy (Precincts – Regional) 2021

A review of the Development against the relevant provisions of the *Statement Environmental Planning Policy (Precincts – Regional) 2021* (Precincts – Regional SEPP) is provided below.

Table 7: State Environmental Planning Policy (Precincts – Regional) 2021 Chapter 4

Section	Evaluation
State Environmental Planning Policy (Precincts – Regional) 2021 Chapter 4	
Section 4.2 Land to which Chapter applies	Thredbo Alpine Resort is listed as one of the Alpine Subregions on the *State Environmental Planning Policy (Precincts – Regional 2021 Thredbo Alpine Resort Map* referenced in Section 4.2.
Section 4.7 Land Use Table	'recreation infrastructure', 'management trails' and 'telecommunication facilities' are considered permissible development with consent within the Thredbo Alpine Resort.
Section 4.21 Heritage Conservation	The Development will not impact upon any heritage items or Aboriginal heritage items or places.
Section 4.24 Flood Planning	There is no defined flood planning area, flood planning level or reference to adopted mapping under the Precincts – Regional SEPP. No further consideration is required.
Section 4.25 Earthworks (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, (b) the effect of the development on the likely future use or redevelopment of the land, (c) the quality of the fill or the soil to be excavated, or both, (d) the effect of the development on the existing and likely amenity of adjoining properties, (e) the source of any fill material and the destination of any excavated material, (f) the likelihood of disturbing relics, (g) the proximity to, and potential for adverse impacts on, a waterway, drinking water catchment or environmentally sensitive area, (h) appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.	a) Unlikely, refer to the waterfront land assessment in **Section 5.2.1** b) The Development will not impact upon the redevelopment of the site. c) The excavated material will be reused onsite. The quality of the excavated soil is not expected to change. d) The Development is consistent within adjoining land uses. There are no adjoining properties. e) In the event of excess spoil from earthworks, it will be transported to the dedicated stockpile sites outlined in the Site Environmental Management Plan: Merritts Mountain Bike Trail and Associated Works (KT 2024) (SEMP). Any imported materials will be sourced from NPWS approved stockpile sites outlined in the SEMP. f) Unlikely, refer to the Due Diligence Assessment in **Section 5.8** g) The Development is located within 40 m of a watercourse, refer to the waterfront land assessment in **Section 5.2.1** for details. h) Sustainable trail building methods will be used in accordance with industry guidelines. Construction methods for the trail, camera cable trench and access track include temporary site controls to manage soil and water quality impacts. Appropriate drainage methods will be incorporated into the trail (e.g. grade reversals, outsloping) and access track (e.g. drainage bars) to manage surface water runoff during operation.
Section 4.26 Master plans	The Snowy SAP Master Plan is applicable to the site.
Section 4.28 Consideration of master plans and other documents (a) the aim and objectives of this Chapter set out in section 4.1, (d) the Geotechnical Policy —Kosciuszko Alpine Resorts published by the Department in November 2003,	The Development is consistent with the aim and objectives of Section 4.1, as demonstrated in this report. Refer to **Section 5.1** for geotechnical considerations.

Section	Evaluation
(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	The Development is consistent with the Snowy SAP Master Plan, refer **Section 4.3.1**.
Section 4.29 Consideration of environmental, geotechnical and other matters (a) measures proposed to address geotechnical issues relating to the development, (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, (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, (d) the cumulative impacts of development and resource use on the environment of the Alpine Subregion in which the development is carried out, (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, (f) the capacity of existing waste or resource management facilities to deal with additional waste generated by the development, including in peak periods. (2) For development involving earthworks or stormwater draining works, the consent authority must also consider measures to mitigate adverse impacts associated with the works. (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.	a) Refer **Section 5.1** for geotechnical considerations. b) No measures to mitigate environmental hazards are proposed that would impact on the conservation of the natural environment. c) The Development is not visible from the Main Range Management Unit. Visual impacts considered acceptable within the context of the site and surrounds, refer **Section 5.6.** d) The impacts of the Development are addressed in **Section 5**. With the implementation of appropriate environmental controls during construction and operation, the Development is not anticipated to result in any significant adverse impacts on identified environmental values of the site and surrounds. e) The Development will not impact upon the capacity of existing infrastructure and services for transport to deal with additional usage generated by the Development. f) The Development will not impact upon the capacity of existing waste or resource management facilities. (2) Earthworks are proposed. Temporary drainage, erosion and sediment control measures will be implemented in accordance with the SEMP during construction to mitigate potential impacts. (3) The Development will not alter the alpine resort character. The Development will contribute to sustainable year-round recreational opportunities.
Section 4.30 Kosciuszko National Park Plan of Management	The Development is not inconsistent with the Kosciuszko National Park Plan of Management.

4.2.3 Integrated development considerations

A review of the *Development referrals guideline* (DPIE 2021) has been undertaken to inform this Application. Integrated development requires development consent and one or more of the approvals outlined in Section 4.46 of the EP&A Act. The Development is integrated development, requiring assessment under the *Water Management Act 2000*.

4.2.4 Biodiversity Conservation Act 2016

The purpose of the *Biodiversity Conservation Act 2016* (BC Act) is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ESD. The *Biodiversity Conservation Regulation 2017* (BC Regulation) sets out threshold levels for when the BOS will be triggered, see below.

Table 8: BC Regulation BOS Triggers

BOS Trigger	Comment
whether the amount of native vegetation being cleared exceeds the area threshold	Given the site is zoned C1 – National Park under the Snowy River Local Environmental Plan 2013, there is no minimum lot size. Therefore, the lot size allows for clearing up to 1 ha. The proposed clearing is below 1 ha, therefore area clearing threshold is not triggered.
whether the impacts occur on an area mapped on the Biodiversity Values Map (BVM) published by the Minister for Environment	The Development will not occur in any BVM areas.
the 'test of significance' in section 7.3 of the BC Act identifies that the development or activity is likely to significantly effect threatened species or ecological communities, or their habitats	The Development is unlikely to significantly impact threatened species or ecological communities or their habitats, refer to the Flora and Fauna Assessment (ELA 2024).
the works are carried out on a declared area of outstanding biodiversity value	Not applicable.

4.3 Plans

4.3.1 Snowy Mountains Special Activation Precinct Master Plan 2022

The Snowy Mountains Special Activation Precinct Master Plan 2022 (Master Plan) applies to the NSW Alpine Resort Areas, including Thredbo. The performance criteria applicable to Thredbo has been reviewed during the development of this proposal.

The Development is consistent with the Master Plan. Mountain biking is a popular recreational activity during the summer months, and the provision of a new inclusive intermediate trail will positively contribute to the social values of Thredbo.

4.3.2 South East and Tablelands Regional Plan 2036

The *South East and Tablelands Regional Plan 2036* (Regional Plan) provides directions for land use planning for the South-east and tablelands region. The Regional Plan promotes well planned, efficient, and sustainable development that complements the area's natural and cultural values.

The Development will address rider safety, operational and environmental issues, and enhance Thredbo's MTB trail network, whilst minimising impacts on the natural environment.

4.3.3 Kosciuszko National Park Cycling Strategy 2017

The *Kosciuszko National Park Cycling Strategy* (OEH 2017) (KNP Cycling Strategy) was prepared for the management of cycling (on-road and off-road) within KNP.

As demonstrated in subsequent sections, the Development will enhance the recreational and social values of KNP, whilst minimising potential impacts to the natural environment, therefore is considered consistent with the KNP Cycling Strategy.

5 Impact assessment

The assessment for the development consisted of a desktop review of publicly available data sources. A preliminary site assessment was undertaken, by KT Project personnel and various technical consultants, to validate the desktop assessment results, inform the design process, and ensure appropriate environmental controls are implemented to avoid, mitigate and/or management potential impacts on environmental and cultural values.

5.1 Geotechnical considerations

A review of the *Geotechnical Policy Kosciuszko Alpine Resorts* (DIPNR 2003) (Geotechnical Policy) was undertaken to inform the planning of this Development. The site is partially located within the designated "G" on the accompanying geotechnical maps for the Kosciuszko Alpine Resort areas (refer **Figure 8**).

The Development will comprise minor earthworks, not involving excavation or fill in excess of one metre in vertical height, therefore in accordance with Section 3.1 of the Geotechnical Policy a geotechnical report is not required. Trail stability is managed through the implementation of sustainable trail construction principles. No further assessment of geotechnical matters is considered necessary.

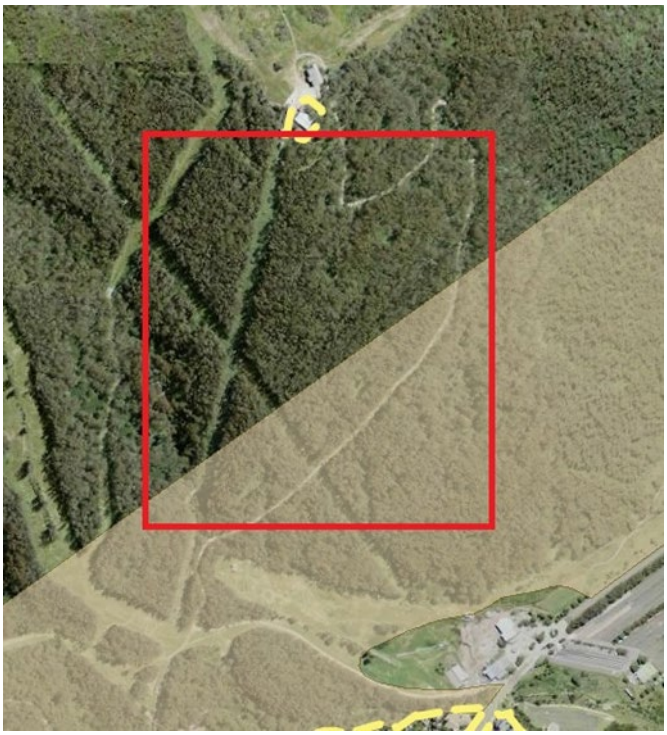


Figure 8: Geotechnical policy area (NSW Planning Portal Spatial Viewer, NSW Government 2024)

5.2 Soil and water

The Development will be constructed to effectively manage erosion and run-off in accordance with sustainable trail design concepts and construction techniques such as rolling contours, outslope, the half rule and 10% average guideline and use of frequent grade reversals to minimise erosion and soil stability risks.

Where areas of disturbance do not form part of the final trail alignment, they will be stabilised and/or revegetated in accordance with the Merritts Intermediate Trail & Associated Works Detailed Rehabilitation and Monitoring Plan (KT 2024), which will assist in achieving an erosion resistant state.

5.2.1 Waterfront land assessment

A small area of the Development is located within 40 m of a mapped watercourse (refer Site Plan, **Figure 2**). Therefore, an assessment has been carried out in accordance with the *DPE Fact Sheet: Controlled Activities – Guidelines for riparian corridors on waterfront land*.

5.2.1.1 Watercourse order

The watercourse is classified as a first order stream under the Strahler system.

5.2.1.2 Riparian corridor width

The recommended width of the Vegetation Riparian Zone (VRZ) (each side of the watercourse) for a first order watercourse is 10 m. The channel width of the watercourse upstream and downstream of the Development is approximately 4 m. Therefore, the total riparian corridor of the watercourse has been assessed as approximately 24 m (20 m + channel width).

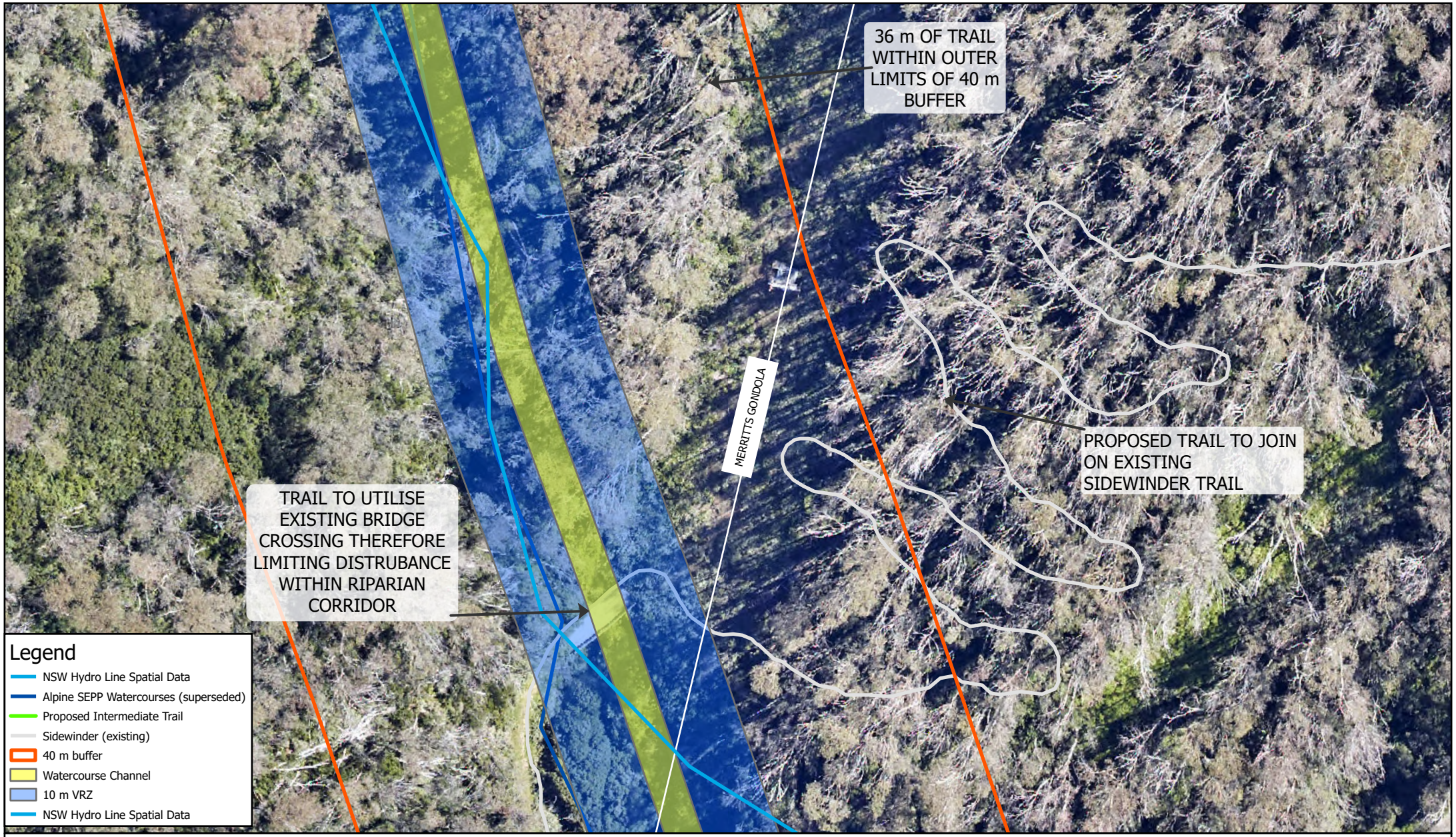
5.2.1.3 Impact assessment

A short section of the new trail located on the edge of the Merritts Gondola lift corridor will result in vegetation clearing within the outer limits of the 40 m waterfront land buffer, refer **Figure 9**.

In addition, minor modifications to the existing Sidewinder trail either side of the existing bridge crossing will be required to cater for adaptive bikes (refer to site plan and **Figure 10** to **Figure 13** for site photos).

The environmental impacts to waterfront land are considered acceptable given the following:

- A minor amount of vegetation clearing is required within the outer limits of the 40 m waterfront land buffer on the edge of the Merritts Gondola lift corridor.
- The section of Sidewinder that is located within waterfront land was constructed partly on a former access track and utilises the existing bridge over the watercourse, therefore limiting new disturbance within the riparian corridor. Only minor modifications to the trail tread are proposed to ensure the surface is suitable for adaptive bikes. Some minor grass and shrub removal/trimming may be required within the existing trail corridor.
- The trail will utilise the existing bridge to cross the watercourse, therefore no new disturbance will occur within the bed or banks of the watercourse.
- Appropriate environmental controls will be implemented during construction in accordance with the SEMP to mitigate potential impacts to the receiving environment.
- The trail will be designed and constructed in accordance with relevant guidelines to ensure the ongoing sustainability of the trail, including the management of surface water runoff and erosion to ensure no adverse impacts to the watercourse and associated corridor during operation.
- The Development is not expected to impact on connectivity within the riparian corridor.



Scale: 1:696

0 3 6 12 18 24 30

Meters

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

N

THREDBO

Waterfront Land Assessment

Project: Merritts Intermediate MTB Trail

Revision: A

Date: 17/10/2024

Produced By: JB

Figure 10: Existing Sidewinder trail within waterfront land (heading towards bridge)

Figure 11: Existing Sidewinder trail within waterfront land (heading towards bridge)

Figure 12: Existing Sidewinder trail after departing bridge crossing within waterfront land

Figure 13: Existing Sidewinder trail within waterfront land

5.3 Biodiversity

A Flora and Fauna Assessment (ELA 2024) is provided in **Appendix B**.

5.4 Waste management

The Development is expected to generate minimal waste. Storage and disposal of waste during construction will be managed in accordance with the SEMP.

5.5 Social and economic

KT have been developing MTB trails within the resort since the 1990s. Consequently, the level of understanding of the existing landscape and industry will ensure that the trail is constructed using sustainable trail design principles; and provide targeted adaptive mountain biking objectives with consideration of the natural, social, and operational setting. The Development is considered within the public interest as the new trail aims to increase participation in the activity and improve the sense of inclusion at Thredbo.

Whilst the Development will result in ongoing trail maintenance costs, the economic impacts will be largely positive as the trail will contribute to improved economic stability for the resort through the provision of an enhanced trail network which will cater to a range of mountain bikers and boost summer visitation.

5.6 Visual impacts

The existing site and surrounds comprise native vegetation, ski runs and associated infrastructure, MTB trails and access tracks. The Development will not alter the character of the resort as it will form part of the existing Thredbo MTB Trail Network. The tread of the trail is shaped using natural materials (rocks and soil) to provide features that blend within the existing landscape.

5.7 Heritage

The Development will not impact any listed heritage items or places.

5.8 Aboriginal cultural heritage

To establish due diligence for the Development, an assessment against the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010) is provided below.

Table 9: Aboriginal cultural heritage due diligence process

Due Diligence Process	Comment
1. Will the activity disturb the ground surface or any culturally modified trees?	The Development will result in ground disturbance There were no culturally modified trees identified during the site survey.
2. Are there any: a) relevant confirmed site records or other associated landscape feature information on AHIMS? And/or	From AHIMs, no recorded Aboriginal sites are located within the immediate Development site. Refer to Appendix B for reference.
b) any other sources of information of which a person is already aware? And/or	Several historical independent assessments have been undertaken within the resort (Dabyne 2020; NGH Environmental 2017; Past Traces Heritage Consultants 2017; Iron Bark Heritage 2013; URS Australia 2004, 2005). All studies provide an indication that the ski slope areas,

Due Diligence Process	Comment
	including downhill mountain bike trail areas) have low archaeological potential due to the level of disturbance associated with the previous ski slope work. The studies also concluded that given the steepness and exposed aspect/lack of sheltering tors, the ski slopes are unlikely to have been favourable campsite locations.
c) landscape features that are likely to indicate presence of Aboriginal objects?	There are no landscape features within the Development site that would indicate the presence of Aboriginal objects due to the extensive disturbance that has occurred. As such, it is considered the Development has low potential to impact on unrecorded Aboriginal objects or sites. There is no requirement to move onto Steps 3 and 4.
3. Can harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out of the activity at the relevant landscape features be avoided?	Not applicable.
4. Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely?	

The assessment concludes an AHIP is not necessary. The works may proceed with caution. Where unexpected items of potential archaeological, built, or Aboriginal cultural heritage significance are discovered, construction staff/contractors to follow the Unexpected Finds Procedure outlined in the SEMP.

5.9 Air quality

Dust can be a nuisance and decrease the amenity value of an area. Dust may be generated during construction from activities such as vegetation clearing, earthworks and vehicle movements. There are no sensitive receptors located within close proximity of the site. With the implementation of appropriate controls during construction, potential dust impacts will be mitigated.

5.10 Noise

It is proposed construction hours of works will be undertaken during standard working hours. This includes 7:00am – 6:00pm Monday to Friday, 8:00am – 1:00pm Saturdays, and no work on Sundays or public holidays. Out-of-hours works are not anticipated. There are no sensitive land uses within close proximity of the site, as such no adverse noise impacts are anticipated.

5.11 Access and traffic

During construction, the site is accessible via the summer mountain access road from Friday Flat. All trail closures will be managed in accordance with the SEMP.

Once operational, riders are able to load the Merritts Gondola from Valley Terminal to access the trail head. Riders on the hill are able to access the trail from existing trails in the Cruiser ski area, i.e. Lower All-Mountain and Sidewinder.

6 Conclusion

This application is seeking development approval for the construction of an intermediate MTB trail, installation of a lift camera and construction of a vehicle access trackwithin Thredbo Alpine Resort, NSW. In accordance with the requirements of the EP&A Act, EP&A Regulations and Precincts – Regional SEPP, this SEE has assessed the potential impacts of the Development on the human, built and natural environment of the site and surrounds. With the implementation of appropriate environmental controls, the impacts are considered acceptable.

The Development is considered within the public interest as the new trail aims to increase participation in mountain biking and improve the sense of inclusion at Thredbo. The lift camera and vehicle access track will support ongoing resort operations and lift safety.

7 References

AusCycling 2019, Australian Mountain Bike Trail Guidelines.

Break the Boundary Inc (BtB) 2018, Australian Adaptive Mountain Biking Guidelines, Mountain Bike Australia & Queensland Government.

DAWE 2023, *National Heritage Places – Australian Alps National Parks and Reserves*, Department of Agriculture, Water and the Environment, https://www.environment.gov.au/heritage/places/national/australia-alps

DCCEEW 2023, *Protected Matters Search Tool*, Department of Agriculture, Water and the Environment, https://www.environment.gov.au/epbc/protected-matters-search-tool

DoE 2013, *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*, Department of the Environment.

DECC 2007, *Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park*, New South Wales, Department of Environment and Climate Change, National Parks and Wildlife Service.

DIPNR 2003, *Geotechnical Policy Kosciuszko Alpine Resorts,* Department of Infrastructure, Planning and Natural Resources, NSW Government.

DPE 2017, *What to include with your development application (DA),* January 2017, Department of Planning & Environment, NSW Government.

DPIE 2006*, Kosciuszko National Park Plan of Management*, Department of Planning, Industry and Environment.

DECCW 2010, *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*, Department of Environment, Climate Change and Water, https://www.heritage.nsw.gov.au/search-for-heritage/publications-and-resources/aboriginal-cultural-heritage-publications/

Eco Logical Australia Pty Ltd 2024, Merritts Intermediate Mountain bike Trail – Thredbo Alpine Resort – Flora and Fauna Assessment.

Heritage NSW 2023, *AHIMS Web Services*, NSW Government, https://www.environment.nsw.gov.au/awssapp/

IMBA 2001, Building Better Trails: Designing, Constructing and Maintaining Outstanding Trails, International Mountain Bicycle Association

IMBA 2012, Trail Difficulty Rating System – Build, International Mountain Bicycling Association Australia

IMBA 2018, Guidelines for a Quality Trail Experience: Mountain Bike Trail Guidelines, June 2018, International Mountain Bicycling Association Australia

NGH Environmental 2017, Aboriginal Heritage Due Diligence Assessment – Thredbo Mountain Bike Trails (Stage 1C)

NSW Government 2023a, ePlanning Spatial Viewer, https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address

NSW Government 2023b, Biodiversity Values Map and Threshold Tool, https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap

NSW Government 2023c, NSW BioNet, https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet

NSW Government 2022d, *Water Management (General) Regulation 2018 Hydro Line spatial data*, https://www.industry.nsw.gov.au/water/licensing-trade/hydroline-spatial-data

OEH 2012, *Regional Pest Management Strategy 2012-17, Southern Ranges Region: a new approach for reducing impacts on native species and park neighbours,* Office of Environment and Heritage, Sydney.

OEH 2017, *Kosciusko National Park Cycling Strategy*, prepared by TRC Tourism for NSW National Parks and Wildlife Service, Office of Environment and Heritage.

Past Traces Heritage Consultants, 2017, Aboriginal Heritage Due Diligence Assessment – Replacement of Merritts Chairlift, Thredbo Alpine Resort.

TRC Tourism 2015, *Guidelines for Trail Planning, Design and Management: A toolkit for state and local government agencies, community groups and investors on how to plan, manage and market exceptional trail experiences*, TRC Tourism Pty Ltd.

URS Australia Pty Ltd, 2004, SEE for the Separation of the Crackenback Supertrail and World Cup Runs, Thredbo.

URS Australia Pty Ltd, 2004, SEE for the Proposed Vegetation Removal, Ski Slopes Thredbo.

URS Australia Pty Ltd, 2005, SEE for Proposed Works on the Tower 10 Ski Run, Thredbo.

8 Appendices

Appendix A Desktop Search Results

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Merritts trails

Client Service ID : 857400

Kosciuszko Thredbo Pty Ltd

Date: 24 January 2024

Po Box 92
Thredbo New South Wales 2625

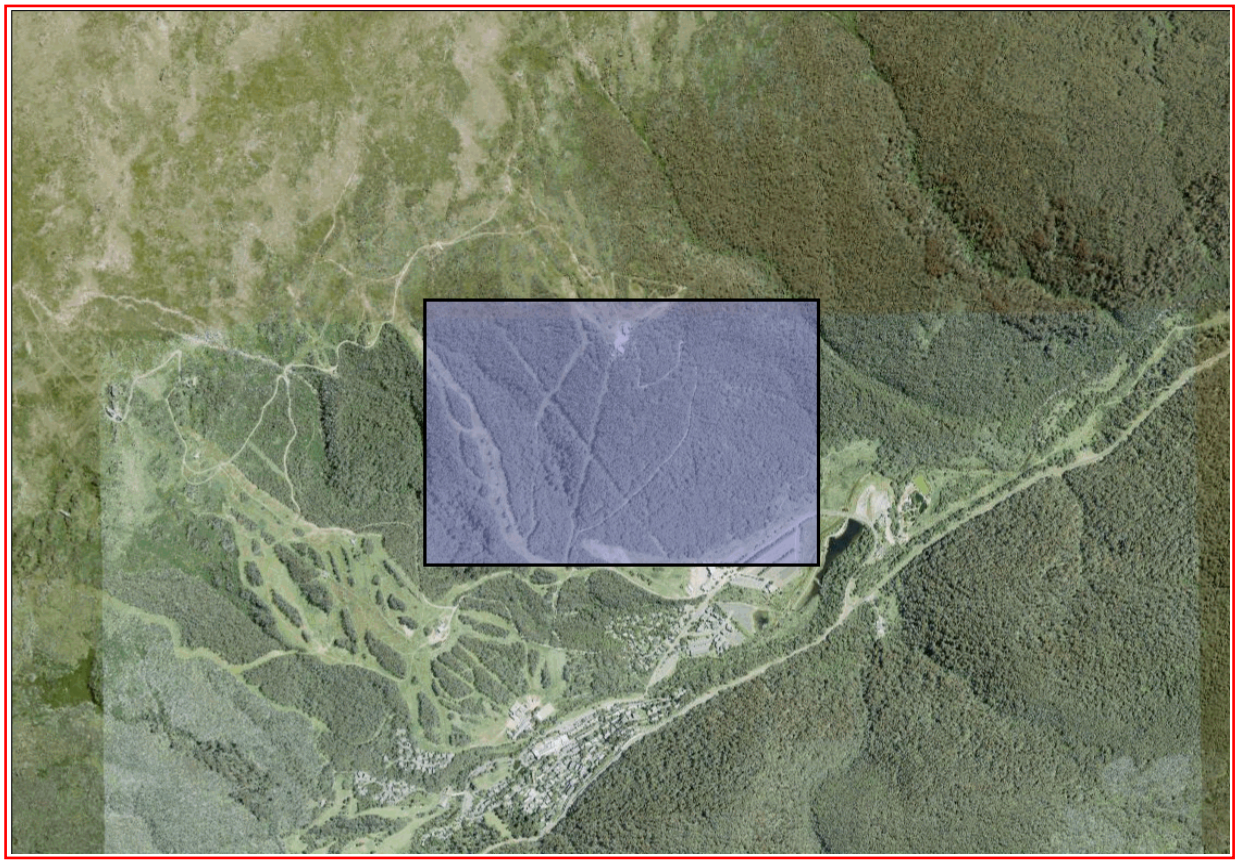
Attention: Chloe Chalk

Email: chloe_chalk@evt.com

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -36.4987, 148.2999 - Lat, Long To : -36.4901, 148.3154, conducted by Chloe Chalk on 24 January 2024.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

EPBC Act Protected Matters Report

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

Report created: 11-Mar-2024

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	2
Wetlands of International Importance (Ramsar	8
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	45
Listed Migratory Species:	10

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	15
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	5
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [Resource Information]

Name	State	Legal Status	Buffer Status
Historic			
Snowy Mountains Scheme	NSW	Listed place	In feature area
Natural			
Australian Alps National Parks and Reserves	ACT	Listed place	In feature area

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	700 - 800km upstream from Ramsar site	In buffer area only
Barmah forest	200 - 300km upstream from Ramsar site	In buffer area only
Blue lake	Within 10km of Ramsar site	In feature area
Gunbower forest	300 - 400km upstream from Ramsar site	In buffer area only
Hattah-kulkyne lakes	500 - 600km upstream from Ramsar site	In buffer area only
Nsw central murray state forests	200 - 300km upstream from Ramsar site	In buffer area only
Riverland	700 - 800km upstream from Ramsar site	In buffer area only
The coorong, and lakes alexandrina and albert wetland	700 - 800km upstream from Ramsar site	In buffer area only

Listed Threatened Ecological Communities [Resource Information]

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

Community Name	Threatened Category	Presence Text	Buffer Status

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

Listed Threatened Species [Resource Information]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum			
Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
Climacteris picumnus victoriae			
Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area	In feature area
Falco hypoleucos			
Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus			
White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma			
Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
CRUSTACEAN			
Euastacus diversus Orbost Spiny Crayfish [66782]	Endangered	Species or species habitat may occur within area	In buffer area only
Euastacus rieki Riek's Crayfish [83155]	Endangered	Species or species habitat likely to occur within area	In feature area
FISH			
Galaxias supremus Kosciuszko Galaxias [87878]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Galaxias terenasus Roundsnout Galaxias [87175]	Endangered	Species or species habitat likely to occur within area	In feature area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In buffer area only
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area	In feature area
FROG			
Litoria verreauxii alpina Alpine Tree Frog, Verreaux's Alpine Tree Frog [66669]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
MAMMAL			
Burramys parvus Mountain Pygmy-possum [267]	Endangered	Species or species habitat known to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area	In feature area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat known to occur within area	In feature area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In buffer area only
PLANT			
Argyrotegium nitidulum Shining Cudweed [82043]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calotis glandulosa Mauve Burr-daisy [7842]	Vulnerable	Species or species habitat may occur within area	In feature area
Colobanthus curtisiae Curtis' Colobanth [23961]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat may occur within area	In feature area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area	In feature area
Pimelea bracteata [8125]	Critically Endangered	Species or species habitat may occur within area	In feature area
Prasophyllum bagoense Bago Leek-orchid [84276]	Critically Endangered	Species or species habitat may occur within area	In feature area
Prasophyllum petilum Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area	In feature area
Pterostylis oreophila Blue-tongued Orchid, Kiandra Greenhood [22903]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Ranunculus anemoneus Anemone Buttercup [14889]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rytidosperma pumilum Feldmark Grass [66716]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Viola improcera Dwarf Violet [3879]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Xerochrysum palustre			
Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			
Cyclodomorphus praealtus			
Alpine She-oak Skink [64721]	Endangered	Species or species habitat known to occur within area	In feature area
Liopholis guthega			
Guthega Skink [83079]	Endangered	Species or species habitat known to occur within area	In feature area
Liopholis montana			
Mountain Skink [87162]	Endangered	Species or species habitat likely to occur within area	In feature area
Pseudemoia cryodroma			
Alpine Bog Skink, Alpine Bog-skink [84408]	Endangered	Species or species habitat known to occur within area	In feature area

Listed Migratory Species [Resource Information]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area

Other Matters Protected by the EPBC Act

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat may occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
[Neophema chrysostoma](#) Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area

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

Extra Information

State and Territory Reserves [Resource Information]

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

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

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

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Snowies Iconic Walk	2019/8558	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Aerial baiting for wild dog control	2006/2713	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

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

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Appendix B Flora and Fauna Assessment

Merritts Intermediate Mountain Bike Trail – Thredbo Alpine Resort – Flora and Fauna Assessment

Kosciuszko Thredbo Pty Ltd

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A TETRA TECH COMPANY

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DOCUMENT TRACKING

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ACKNOWLEDGEMENTS

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

Template 2.8.1

Contents

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Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method
BC Act	*NSW Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
CEEC	Critically Endangered Ecological Community
DoCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
DoCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DPE	NSW Department of Planning and Environment
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	*NSW Environmental Planning and Assessment Act 1979*
EPBC Act	*Commonwealth Environment Protection and Biodiversity Conservation Act 1999*
FM Act	*NSW Fisheries Management Act 1994*
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	*NSW Water Management Act 2000*

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 a new intermediate mountain bike trail in the Merritts area at Thredbo Alpine Resort.

The construction of the proposed trail will require the clearing of small trees, shrubs and groundcovers in a 3-4 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 and Montane Wet Tussock Grassland.

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 less than the 1 ha threshold at which the BOS is triggered.

The study area and immediate surrounds was found to support four native vegetation communities; Subalpine Woodland, Tall Subalpine Heath, Subalpine Riparian Scrub and Montane Wet Tussock Grassland, with parts of the study area also comprising Exotic Grassland or other heavily disturbed vegetation. No threatened flora species were recorded within the study area 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. Approximately 0.86 ha of Subalpine Woodland and 0.02 of Tall Subalpine Heath 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, Pink Robin, Scarlet Robin, Flame Robin and Pilotbird, similar habitats are extensive in the locality and the habitats to be affected are small in the context of the extent of similar habitats contiguous with the study area. Furthermore, the proposal will not affect any potentially important habitats for threatened fauna species. The proposal will not sever any linkages between habitats or otherwise permanently restrict fauna movement.

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

Following consideration of the administrative guidelines for determining significance under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999*, it is concluded that the proposal is unlikely to have a significant impact on matters of National Environmental Significance or Commonwealth land, and a referral to the Commonwealth Environment Minister is not 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 (KT) to prepare a flora and fauna assessment to accompany a proposal to construct a mountain bike trail in the Merritts area, 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 vegetation and habitats.

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

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

1.1 The proposal

The proposal is to construct a new intermediate mountain bike trail in the Merritts area. The purpose of this development is to create an inclusive intermediate mountain bike trail that can be utilised by a range of riders, including those who ride adaptive bikes. Adaptive mountain biking includes a range of riders who cannot ride a standard two-wheeled bikes and require adapted equipment and trails to suit their physical, intellectual, neurological and/or sensory abilities. There are a number of considerations including trail width, turning radius, gradient, camber and limits on technical features to ensure the safety of adaptive riders.

The intermediate trail starts at the top of Merritts Gondola and terminates at the Gondola mid station. From start to finish the trail ranges in elevation from approximately 1,630-1,500 m AHD. The start of the trail uses the Gondola Connect trail (approved under DA 21/11659). Modifications to the Gondola Connect trail (identified as section A on the Site Plan, see Figure 1) will be required to cater for adaptive bikes. The trail then descends from nearby the Easy Rider T-bar bottom station where it crosses the summer mountain access road and existing Lower All-mountain trail. The trail then descends through the forest before it rejoins onto Sidewinder (approved under DA 10312). To enable riders access into the Gondola mid station, modifications to sections of Sidewinder trail (identified at sections C and E on the Site Plan) will be required to cater for adaptive bikes. No modifications to the bridge (watercourse crossing) on the lower section of Sidewinder is required. The trail will incorporate rolling contours, grade reversals, berms, jumps, and natural obstacles to create an interesting trail for users.

The average trail tread will be 1.5 m wide to account for adaptive rider considerations. The proposed trail will result in an expected average disturbance footprint width of 3-4 m to allow for going around large obstacles such as tree roots, which are not suitable for adaptive bikes.

The proposal also includes the installation of a camera on Gunbarrel lift tower 12 and installation of an underground cable between an existing communications pit on Dream Run that connects to the camera on tower 12. The camera is a safety requirement for the lift operation as it will allow operators to view chair activity along this section of the alignment and inform lift closures from high wind events. The trench disturbance will be approximately 30 m^2 (100 m long x 300 mm wide) requiring the removal of some shrubs and groundcover. The trench will be dug with 1.7t excavator with rubber tracks. The proposed cable alignment is located within the Stage 1B MTB Trails offset area. The requirements of the offset area include a management regime that precludes the routine maintenance activity of slashing the health vegetation on a bi-annual basis. Following installation of the cable, the trench alignment will be rehabilitated with the following nominated species, including a mix of grasses, ground covers and shrubs. These species have been selected from the Gunbarrel offset area species list.

- *Coronidium scorpioides* (Button Everlasting)
- *Acaena novae-zelandiae* (Bidgee-widgee)
- *Olearia phlogopappa* (Dusty Daisy Bush)
- *Olearia megalophylla* (Large Leaf Daisy Bush)
- *Ozothamnus secundiflorus* (Cascade Everlasting)
- *Poa fawcettiae* (Smooth Blue Snowgrass)

The proposed development also includes modifications to an existing access track to allow for extraction of riders. The track runs from Merritts Summer Road, up the Gunbarrel lift corridor as shown on the Site Plan (Figure 1). The track will be surfaced with decomposed granite and road base. Water bars will be constructed into the track where required by the ground contours and expected water impacts.

The proposed works are expected to affect 0.88 ha of native vegetation, some of which comprises disturbed derived shrubland underneath the existing Gunbarrel and Merritts Gondola lift-lines.

The impacts of the proposed development can be summarised as follows:

- The clearing of shrubs and groundcovers in a 3-4 m wide corridor where the trail traverses native vegetation. The disturbance corridor is required to contain the batters and the trail surface when the trail is traversing across moderate to steep slopes. 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.
- Trenching for the 100 m long x 300 mm wide camera installation.
- Importation of decomposed granite for the track surface and for the proposed access tracks.

An overview of the proposal is shown in Figures 1-3 and further identified in Photos 1-16. A more detailed description of the proposal is also provided in the Statement of Environmental Effects for the proposal (Kosciuszko Thredbo 2024).

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 0.88 ha of native vegetation (predominantly Subalpine Woodland).

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

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

The proposal is not anticipated to result in any substantial changes in surface or subsurface hydrology which may lead to the loss or adverse modification of vegetation communities or associated habitats. 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 to 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 3 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 1-3, 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), as shown in Figure 3.
- The area of native vegetation affected will be approximately 0.88 ha, which is 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).

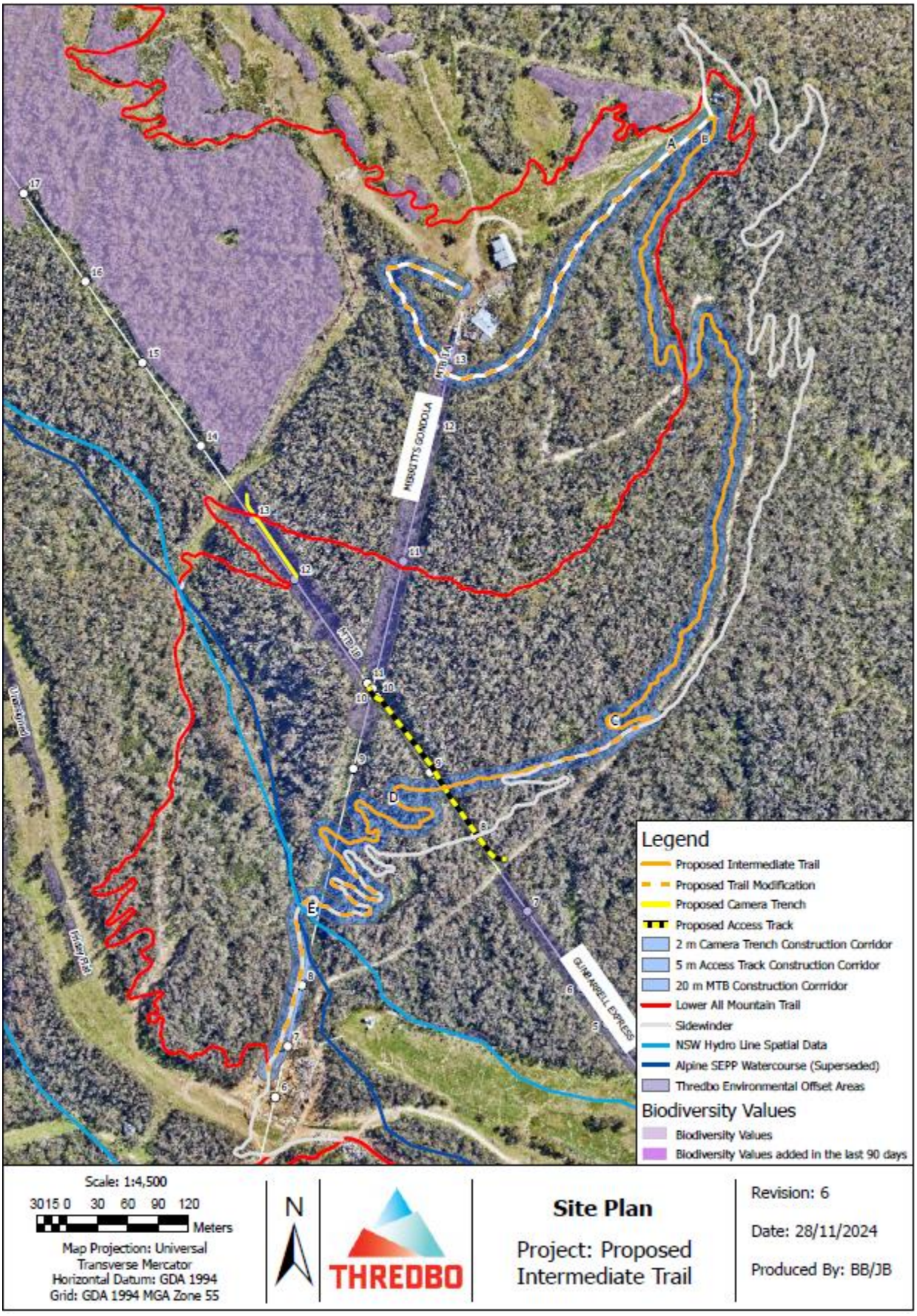

Figure 1: The proposal and site plan.

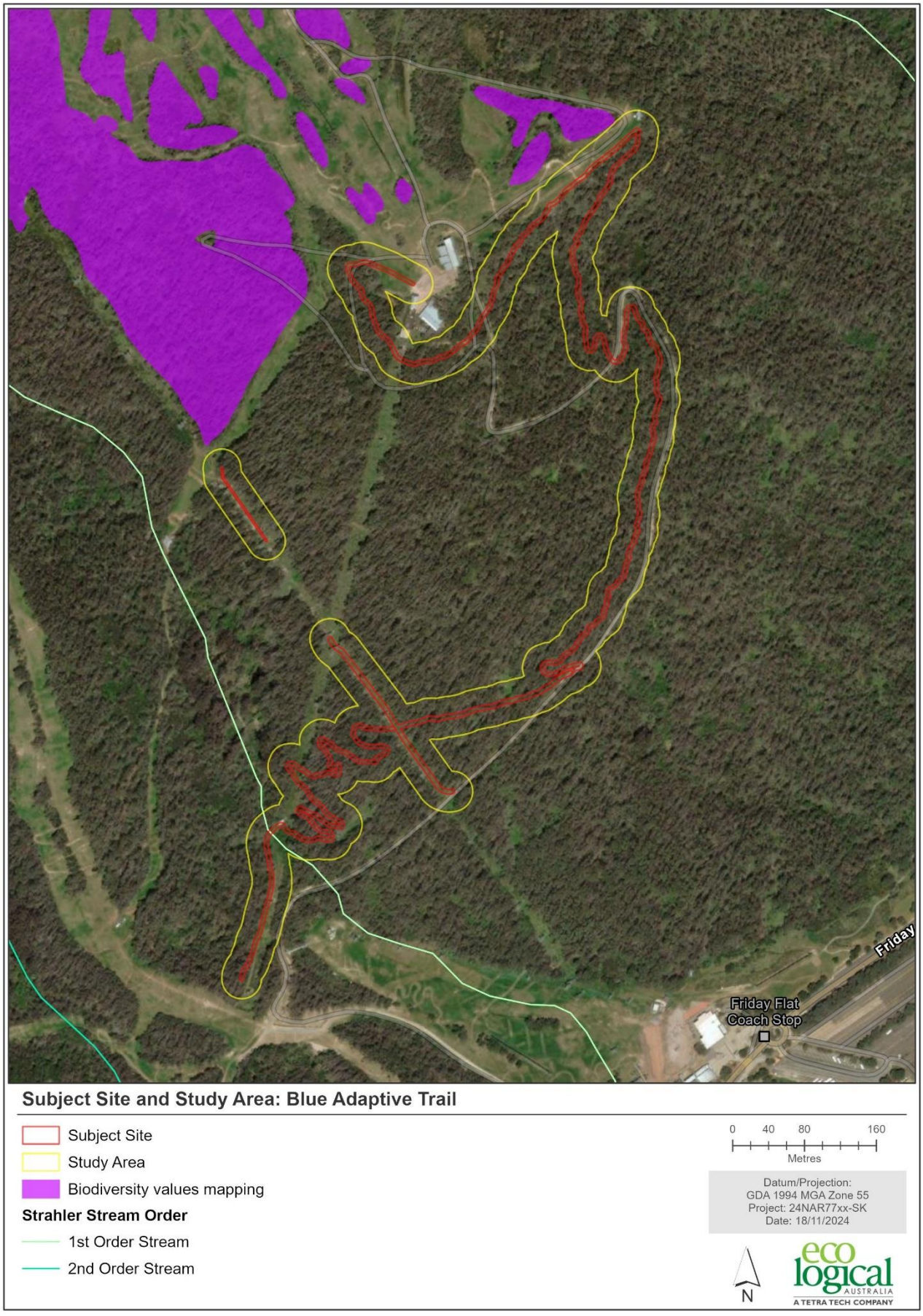

Figure 2: The subject site and study area.

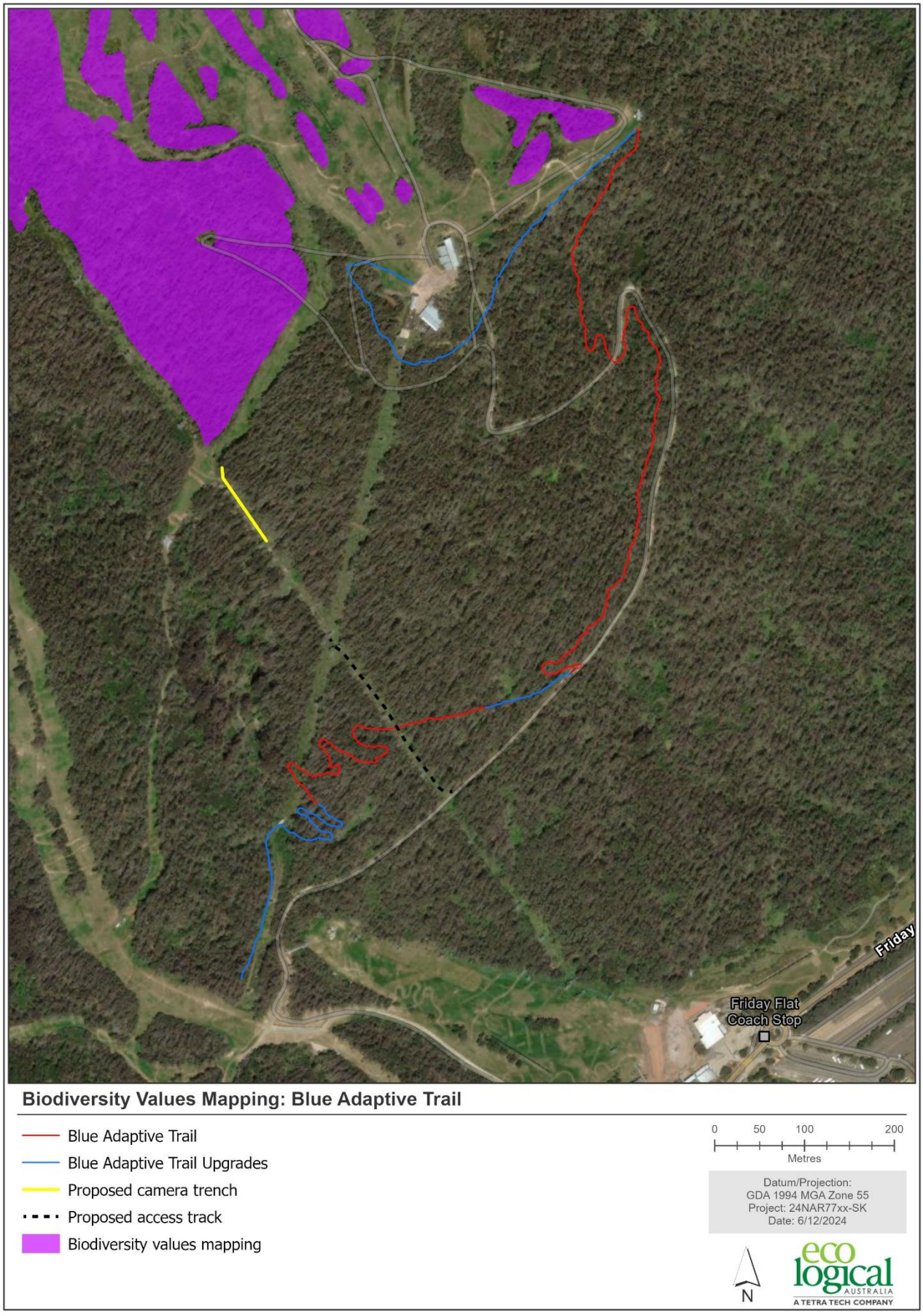

Figure 3: The subject site relative to the Biodiversity Values Map.

Photo 1:The proposed development involves widening of the existing Gondola Connect trail to cater for adaptive bikes.

Photo 2: New trail will be constructed from the Easy Rider T-bar bottom station from where the trail will head back towards the the summer mountain access road staying just higher, but almost parallel to, the existing Lower All Mountain trail.

Photo 3: The new trail traverses Subalpine Woodland as it heads back towards the summer mountain access road.

Photo 4: The new trail alignment traverses the summer mountain access road at the same location as the existing Lower All Mountain trail.

Photo 5: The new trail run parallel to the summer mountain access road until it joins the existing Sidewinder trail.

Photo 6: The new trail traverses the Subalpine Woodland below the Merritts area, remaining 10-20 m from the summer mountain access road.

Photo 7: The new trail joins the existing Sidewinder trail just to the west of the summer mountain access road.

Photo 8: The existing Sidewinder trail be widened on the lower side to avoid encroachment into the Montane Wet Tussock Grassland upslope.

Photo 9: The new trail traverses the Gunbarrel lift-line before descending in series of switchbacks to the bridge crossing.

Photo 10: The new trail traverses the Subalpine Woodland heading towards the Merritts Gondola lift-line.

Photo 11: The new trail traverses the Merritts Gondola lift-line before turning in the Subalpine Woodland just to the west of the lift-line and returning to the Subalpine Woodland to the east.

Photo 12: The new trail traverses the Merritts Gondola lift-line before heading into the Subalpine Woodland just to the east.

Photo 13: The new trail eventually re-joins the existing Sidewinder trail, which will be modified to the new trail specifications.

Photo 14: The existing Sidewinder trail will be modified new the new trail specifications all the way to the Merritts Gondola mid-station.

Photo 15: The proposed Gunbarrel lift camera will affect approximately 30 m^2 derived shrubland beneath the Gunbarrel lift-line.

Photo 16: The proposed vehicle access track alignment from the summer mountain access road will be aligned to take advantage of an existing disturbance corridor.

1.5 Topography, geology and soils

The study area occupies moderately sloping east facing slopes at an altitude of between approximately 1,630 m and 1,500 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 Merritts Creek but will not traverse any mapped watercourses, accept where there is an existing bridge, as shown in Figure 2.

1.6 Disturbances

Parts of the study area have already been disturbed in association with the existing ski runs and clearances for chairlifts. The ski slopes 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), *Taraxacum officinale* (Dandelion), and *Hypochaeris radicata* (Flatweed). The lift lines support regrowth shrubs and eucalypts. Shrubs and areas of remnant forest 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.

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 (Kosciuszko Thredbo 2024). 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 and a flora and fauna assessment has been prepared. The impacts of the proposed development will be subject to a test of significance with respect to the Section 7.3 of the BC Act.

1.7.3 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 Department of Environment and Heritage.

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 18 September 2023, and 25 and 26 March 2024.

2.2.1 Flora surveys

A botanical survey was conducted in the study area by ELA Principal Ecologist Ryan Smithers on 18 September 2023, and 25 and 26 March 2024.

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 eight person-hours.

2.2.2 Fauna surveys

Field investigations for fauna were conducted in conjunction with the flora surveys on 18 September 2023, and 25 and 26 March 2024.

2.2.2.1 Habitat analysis

A description of the fauna habitats in the study area was prepared because the type of habitat in an area influences which animals occur there, as well as diversity and abundance. This habitat assessment also has an important role in predicting threatened fauna likely to occur in an area. The information collected usually includes the type of vegetation present, the presence/absence of rock habitats, tree hollows, ponds, streams, wetlands, foraging substrates and other features likely to attract threatened fauna. The study area and immediate surrounds were traversed to identify habitat components, which were recorded and described.

2.2.2.2 Diurnal surveys

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

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

2.2.2.3 Limitations

The results of fauna surveys can be optimised by conducting investigations over a long period to compensate for the effect of unfavourable weather, seasonal changes and climatic variation. In general, the longer the survey the more species will be detected. Results can also be improved by using a wide range of techniques, since some species are more likely to be detected by a particular method.

However, surveys are subject to constraints that determine the amount of time allocated, the methods used and the timing of the work. Thus, the results should be viewed in the light of these limitations. The fauna detected during the survey period are a guide to the native fauna present, but are by no means a definitive list of the species occurring in the study area. Nevertheless, the techniques used in this investigation are considered adequate to 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 eight 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 four native vegetation communities; Subalpine Woodland, Tall Subalpine Heath, Subalpine Riparian Scrub and Montane Wet Tussock Grassland, with Exotic Grassland and Disturbed Vegetation on the ski slopes, as shown in Figure 4.

3.2.1 Subalpine Woodland

Subalpine Woodland dominates the study area, as shown in Figure 4. It is the most dominant community within the Thredbo Resort area covering an estimated 443 ha (Ecology Australia 2002). It equates with Plant Community Type (PCT) 3381 - *Kosciuszko Alpine Sally Woodland*.

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%. There is a very sparse sub-canopy in places of *Acacia obliquinervia* (Mountain Hickory) to a height of 4 m and PFC of less than 1%. The understorey is dominated by *Bossiaea sericea* 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), *Ozothamnus secundiflorus* (Cascade Everlasting), *Podocarpus lawrencei* (Mountain Plum Pine), and *Olearia megalophylla* (Large-leaf Daisy Bush).

The groundcover is typically sparse given the density of the understorey and includes patches of species such as *Poa ensiformis* (Purple-sheathed Tussock-grass), *Poa fawcettiae* (Smooth Blue Snowgrass), *Asperula gunnii* (Mountain Woodruff), *Senecio gunnii*, *Stellaria pungens*, *Dianella tasmanica* (Tasman Flax-lily), *Geranium potentilloides* var. *potentilloides*, *Acaena novae-zelandiae* (Bidgee-widgee), *Goodenia hederacea* subsp. *alpestris, Oxalis exilis, Hydrocotyle algida* and *Polystichum proliferum* (Mother Shield Fern). *Poa helmsii* (Broad-leaved Snowgrass) occurs where drainage is impeded.

Where the study area includes the Merritts Gondola and Gunbarrel lift-lines, the vegetation comprises a shrubland derived from the clearing of the Subalpine Woodland canopy.

3.2.2 Tall Subalpine Heath

This community occurs patchily, throughout the subalpine tract within the Thredbo Resort area and within the Thredbo Valley (Ecology Australia 2002). In the higher subalpine and montane it does not equate well with any PCT, and is probably best considered as part of PCT 3381. Within the study area it is restricted to the upper slopes adjacent to the summer mountain access road, as shown in Figure 4.

Within the study area, Tall Subalpine heath is very similar floristically to the surrounding Subalpine Woodland, apart from the absence of trees and presence of some wet heath species such as *Baeckea* spp. The community is characterised by heath/shrubland dominated by *Bossiaea sericea*, *Olearia phlogopappa*, *Ozothamnus secundiflorus, Podocarpus lawrencei* and *Baeckea utilis* (Mountain Baeckea). The groundcover includes species such as *Poa fawcettiae, Hovea montana, Oxylobium ellipticum*, *Asperula gunnii*, *Senecio gunnii*, and in the wettest areas *Poa helmsii* and *Epilobium gunnianum* (Gunn's Willow-herb).

3.2.3 Montane Wet Tussock Grassland

Within the study area Montane Wet Tussock Grassland is limited to two patches associated with poorly drained areas just above the existing Sidewinder trail and between the Merritts Gondola and Gunbarrel lift-lines, as shown in Figure 4. The existing Sidewinder trail goes just below the higher patch, as shown in Photo 8, and approaches the upslope side of the lower patch in two locations, as shown in Figure 4. The existing trail will be widened as required consistent with the new trail specifications.

Montane Wet Tussock Grassland is not well described by Ecology Australia (2002) or any PCT, but occurs in several locations within Subalpine Woodland on the slopes below the Merritts area. The community sometimes occurs just upslope of patches of Subalpine Riparian Scrub. Adjacent to the study area the community lacks species typically associated with Subalpine Bog such as *Epacris* spp. and *Empodisma minus*, but is dominated by *Poa helmsii* and also species such as *Rubus parvifolius* (Native Raspberry), *Geranium potentilloides* var. *potentilloides*, *Acaena novae-zelandiae*, *Geum urbanum* (Herb Bennet), *Senecio gunnii*, *Stellaria pungens*, *Ranunculus lappaceus* (Common Buttercup) and *Polystichum proliferum*.

3.2.4 Subalpine Riparian Scrub

Subalpine Riparian Scrub occurs along the creek traversed by the lower parts of the Sidewinder trail. There will be no impacts on the community in association with the proposed development. Subalpine Riparian Scrub equates with PCT 3296 - *Kosciuszko Flanks Moist Gully Forest*.

The community is characterised by a closed sub-canopy of *Leptospermum grandifolium* (Mountain Tea-tree) to a height of approximately 8-10 m and PFC of up to 90%, beneath a canopy dominated by *Eucalyptus pauciflora*. A patchy and typically sparse understorey of species more typically associated with the surrounding Subalpine Woodland occurs on the margins of the community and includes species such as *Bossiaea sericea*, *Olearia phlogopappa*, *Tasmannia xerophila*, *Ozothamnus secundiflorus* and *Polyscias sambucifolia* subsp*. leptophylla*.

The patchy groundcover includes patches of species such as *Poa ensiformis*, *Blechnum penna-marina* subsp. *alpine* (Alpine Water Fern), *Polystichum proliferum, Dianella tasmanica*, *Senecio gunnii*, *Stellaria pungens*, *Geranium potentilloides* var. *potentilloides*, *Acaena novae-zelandiae*, *Ranunculus graniticola* (Granite Buttercup), and *Hydrocotyle algida*.

3.2.5 Exotic Grassland and Disturbed Ski Slopes

The most heavily disturbed parts of the study area, i.e. the ski slopes in the Merritts area and parts of the lift-lines, 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*.

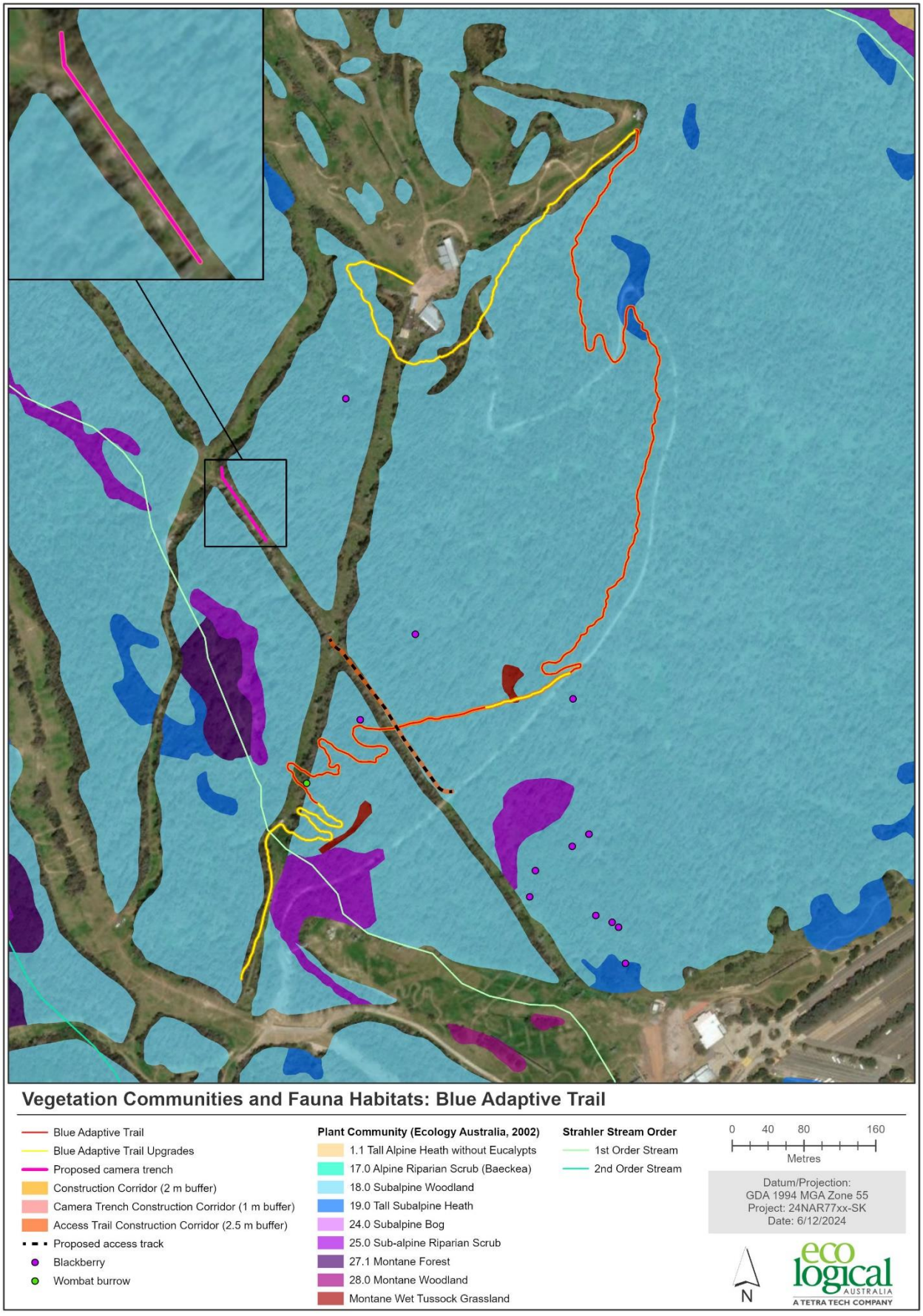

Figure 4: Plant community types and fauna habitats within the study area.

3.3 Fauna

3.3.1 Fauna habitats

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

The Subalpine Woodland which dominates the study area provides habitat for native birds, terrestrial and arboreal mammals, microchiropteran bats 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 Pink Robin is known to breed in the Mountain Ash Forests within the Thredbo Valley, including the patches of Mountain Ash Forest associated with the gullies to the north and south of the High Noon ski run. However, given the Pink Robin's fidelity with the Mountain Ash Forests (MGP 1986), it is unlikely that it would breed within the study area although it may forage there. The Olive Whistler is more likely to breed and forage within the study area, given its preference for dense understorey cover.

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

The study area provides a small amount of potential foraging and sheltering habitat for the Broad-toothed Rat, which is likely 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 habitat for *Vombatus ursinus* (Common Wombat) and a burrow was observed in one location, as shown in Figure 4. It is possible that there are other burrows close to the trail alignments.

The rock habitats, logs and dead trees within the study area provide a limited basking and foraging resource for reptiles, however given the predominance of a dense understorey, habitats for reptiles within the study area are generally relatively poor.

The limited water habitats within the study area provide a small foraging and breeding resource for frogs such as *Crinia signifera* (Common Eastern Froglet) and possibly other species, although no frogs were calling during the survey period. The Exotic Grasslands are likely to be utilised by exotic species such as *Lepus timidus* (Brown Hare), *Oryctolagus cuniculus* (Rabbits) and *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 0.86 ha of the Subalpine Woodland vegetation community in association with the clearing of the 3-4 m wide alignment where the new trail traverses intact patches of the community or where the existing trail will be widened.

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.

In this context the loss of approximately 0.86 ha of Subalpine Woodland (<0.2% of the extent of the community with the Thredbo Resort area) is a relatively minor and acceptable impact.

4.1.2 Tall Subalpine Heath

The proposal will result in the removal of approximately 200 m^2 of Tall Subalpine Heath in association with the clearing of the 3-4 m wide alignment where the new trail traverses intact patches of the community.

Ecology Australia (2002) estimate that there is approximately 64.7 ha of the community within the Thredbo Resort area (Ecology Australia 2002). The community also occurs up and downstream of the Thredbo Village on the flats adjacent to the Thredbo River and on adjacent lower slopes.

In this context, the loss or disturbance of approximately 0.02 ha of Tall Subalpine Heath (at most 0.03% of the extent of the community with the Thredbo Resort area) is a relatively minor and acceptable impact.

4.1.3 Other communities

The proposal has been designed to avoid the Subalpine Riparian Scrub and Montane Wet Tussock Grassland vegetation communities and will not have any impacts on them. Where the existing Sidewinder trail will be widened to meet the new trail specifications, these works will be undertaken such that there are no adverse impacts on the nearby Montane Wet Tussock Grassland. In relation to the higher patch of Montane Wet Tussock Grassland, any widening of the existing trail will be undertaken such that the works occur on the lower side of the existing trail. Modifications to the existing trail where it approaches the lower patch will be undertaken such that the new works do not extend any closer to the nearby Montane Wet Tussock Grassland.

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 a few 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, *Podocarpus lawrencei* 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 scattered *Podocarpus lawrencei* 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 *Podocarpus lawrencei* 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, Pink Robin, 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 approximately 0.88 ha of native vegetation (predominately understorey and groundcovers), 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, 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. Similarly, there will be no adverse impacts on the Pink Robin as the proposal will not affect any potential breeding habitat for the species and will affect only a very small amount of marginal potential foraging habitat.

The proposed works will be in close proximity to at least one wombat burrow. However, given the minor footprint of the trail it is unlikely that any wombat burrows will need to be removed or excavated or that any wombats will need to be relocated. Recommendations are provided in Section 5 to minimise impacts on wombats in association with the proposal.

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 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					
Mastacomys fuscus	Broad-toothed Rat	—	E	E	Potential
Cercartetus nanus	Eastern Pygmy-possum	—	V	—	Potential
Callocephalon fimbriatum	Gang-gang Cockatoo	—	E	E	Potential
Petroica boodang	Scarlet Robin	—	V	—	Potential
Petroica phoenicea	Flame Robin	—	V	—	Potential
Petroica rodinogaster	Pink Robin	—	V	—	Potential
Pachycephala olivacea	Olive Whistler	—	V	—	Potential
Pycnoptilus floccosus	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. 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.
3. 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.
4. 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 KT Environmental Coordinator for any potential hollows or fissures that could potentially be used for sheltering by the Eastern Pygmy-possum.

Montane Wet Tussock Grassland

5. Any widening of the existing Sidewinder trail should be undertaken such that the works occur on the lower side of the existing trail.
6. Modifications to the existing Sidewinder trail where it approaches the lower patch of Montane Wet Tussock Grassland should be undertaken such that the new works do not extend any closer to the nearby Montane Wet Tussock Grassland.

Sediment control

7. 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.
8. 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

9. Rehabilitation activities should be consistent with the resort areas rehabilitation guidelines (NGH Environmental 2007).
10. 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 a new intermediate mountain bike trail, and associated works, in the Merritts area at Thredbo Alpine Resort.

The study area and immediate surrounds was found to support four native vegetation communities; Subalpine Woodland, Tall Subalpine Heath, Subalpine Riparian Scrub and Montane Wet Tussock Grassland, with Exotic Grassland and Disturbed Vegetation on the ski slopes. 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. Approximately 0.86 ha of Subalpine Woodland and 0.02 ha of Tall Subalpine Heath 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, Pink Robin, Scarlet Robin, Flame Robin and Pilotbird, similar habitats are extensive in the locality and the habitats to be affected are small in the context of the extent of similar habitats contiguous with the study area. Furthermore, the proposal will not affect any potentially important habitats for threatened fauna species. The proposal will not sever any linkages between habitats or otherwise permanently restrict fauna movement.

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

Following consideration of the administrative guidelines for determining significance under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999*, it is concluded that the proposal is unlikely to have a significant impact on matters of National Environmental Significance or Commonwealth land, and a referral to the Commonwealth Environment Minister is not 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						
Argyrotegium nitidulum *syn. Euchiton nitidulus*	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
Calotis glandulosa	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 Poa 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
Calotis pubescens	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 *Poa hookeri*); not subject to periodic inundation. There is no suitable habitat for the species within the study area.	No
Carex archeri	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
Carex raleighii	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
Colobanthus curtisiae	Curtis' Colobanth	-	-	V	Curtis' Colobanth is a small perennial herb growing to 40 mm high. It requires bare ground for recruitment from seed and responds well to some disturbance such as grazing. The species flowers from November to February and is largely self-pollinated. In New South Wales, the species is endemic to Kosciusko National Park where it occurs in subalpine / montane treeless	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					zone below 1800 m altitude. There is no habitat for the species within the study area.	
Glycine latrobeana	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
Haloragis exalata subsp. *exalata*	Square Raspwort	-	V	V	The Square Raspwort appears to be a post-disturbance coloniser, based on observations of large numbers of plants on disturbed roadsides, cleared power-line easements, and recently burnt or flooded areas. The nearest populations are in the Geehi Valley. There is no suitable habitat for the species within the study area.	No
Leucochrysum albicans subsp. *tricolor*	Hoary Sunray	-	E	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
Pimelea bracteata	-	-	CE	CE	*Pimelea bracteata* 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.	No
Prasophyllum bagoense	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
Prasophyllum petilum	Tarengo Leek Orchid	-	E	E	Tarengo Leek Orchid reaches to 35 cm tall. This species can be distinguished from the more common onion orchids (Microtis spp.) that grow in its habitat by the pinkish-purple base to the leaf. The flowering time for this species varies from north to south. Populations around Muswellbrook and Ilford	Unlikely

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					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 *Poa labillardieri*, Black Gum *Eucalyptus aggregata* and tea-trees *Leptospermum* spp. near Queanbeyan and within the grassy groundlayer dominated by Kanagroo Grass under Box-Gum Woodland at Ilford (and Hall, ACT).	
Pterostylis oreophila	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.	Unlikely
Ranunculus anemoneus	Anemone Buttercup	-	V	V	This perennial forb of the 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
Rytidosperma pumilum	Feldmark Grass	-	V	V	Felmark Grass is limited to a tiny area of feldmark - about 3ha - of the Main Range of Kosciuszko National Park between Mt Northcote and Mt Lee. There is no suitable habitat for the species within the study area.	No
Rytidosperma vickeryae	Perisher Wallaby Grass	-	E	-	This perennial grass is associated with treeless subalpine streamside vegetation and has been recorded from Perisher, Betts, and Spencers Creeks and tributaries, and Happy Jacks Plain. It is associated with bogs and sphagnum mounds. There is no suitable habitat for the species within the study area.	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
Thesium australe	Austral Toadflax	-	V	V	This species is semi-parasitic on roots of a range of grass species, mainly Kangaroo Grass.	No
Viola improcera	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
Xerochrysum palustre	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.	Unlikely
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 Empodisma minus 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
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.	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					It occurs in an arc along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW to central Victoria	
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						
Maccullochella peelii	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
Macquaria australasica	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
Prototroctes maraena	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 Murray-Darling system (DPI 2006; McDowall 1980b). There is no suitable habitat within the study area.	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
MAMMALS						
Burramys parvus	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
Cercartetus nanus	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
Dasyurus maculatus	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 are 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
Mastacomys fuscus	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 runways through dense vegetation of wet grass, sedge or heath and under the snow in winter.	Potential

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
Petauroides volans	Southern Greater Glider		E	E	The Greater Glider occurs in Eucalypt forests along the ranges and coastal plains of eastern Australia, feeding almost exclusively on the young leaves and flower buds of select Eucalypt species. It shelters in tree hollows, with a particular preference for large hollows in large, old trees. Individuals occupy relatively small home ranges (1-3 ha). The forest within and immediately surrounding the study area does not constitute old growth which is the preferred habitat for the species, as such it is unlikely that the species would occur there.	Unlikely
Petaurus australis	Yellow-bellied Glider		V	V	This species is restricted to tall mature forests, preferring productive tall open sclerophyll forests with a mosaic of tree species including some that flower in winter (Environment Australia 2000, Braithwaite 1984, Davey 1984, Kavanagh 1984; DECC 2007). Large hollows within mature trees are required for shelter, nesting and breeding (Henry and Craig 1984; DECC 2007). There are no records of the species within the Thredbo Valley and it is considered unlikely that it would occur within the study area.	Unlikely
Petrogale penicillata	Brush-tailed Rock-wallaby		E	V	The Greater Glider occurs in Eucalypt forests along the ranges and coastal plains of eastern Australia, feeding almost exclusively on the young leaves and flower buds of select Eucalypt species. It shelters in tree hollows, with a particular preference for large hollows in large, old trees. Individuals occupy relatively small home ranges (1-3 ha). The forest within and immediately surrounding the study area does not constitute old growth which is the preferred habitat for the species, as such it is unlikely that the species would occur there.	No
Phascolarctos cinereus	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 occur in the study area and would not be resident there.	No
Pseudomys fumeus	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

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
Pteropus poliocephalus	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						
Litoria spenceri	Spotted Tree Frog		CE	E	The Spotted Tree Frog is associated with a range of vegetation communities from montane forest at high altitudes to wet and dry forest at moderate to low altitudes respectively. It occurs along sections of streams with steep banks, invariably in steeply dissected country or gorges with numerous rapids and waterfalls. It is restricted to riffle and cascade stream sections with exposed rock banks, resulting in a highly patchy distribution along most streams. Adults and juveniles most likely remain in the vicinity of the stream, rarely venturing far from the riparian zone. Tadpoles occur predominantly in slow-flowing sections of streams. There is no suitable habitat within the study area.	No
Litoria raniformis	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
Litoria verreauxii alpina	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 highly unlikely that it would occur there.	Unlikely

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
Pseudophryne corroboree	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						
Aprasia parapulchella	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
Cyclodomorphus praealtus	Alpine She-oak Skink		E	E	In NSW, the species is known from open alpine heath and tussock grassland within the Kosciuszko region, preferring treeless or lightly treed areas. The study area does not include any suitable habitat for this species and it is considered unlikely that it would occur there.	Unlikely
Eulamprus kosciuskoi	Alpine Water Skink		-	E	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
Liopholis guthega	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	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					humus soils beneath boulders and shrubs. The species is not associated with Subalpine Woodland and is highly unlikely to occur within the study area.	
Liopholis montana	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
Pseudemoia cryodroma	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 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.	No
BIRDS						
Anthochaera phrygia	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 (Casuarina cunninghamiana). 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
Artamus cyanopterus cyanopterus	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-	Unlikely

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					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.	
Botaurus poiciloptilus	Australasian Bittern		E	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
Callocephalon fimbriatum	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 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.	Potential
Calyptorhynchus lathami	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
Climacteris picumnus	Brown Treecreeper (eastern subspecies)		V	—	This species occurs in Eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is not usually not 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
Daphoenositta chrysoptera	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

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
Falco hypoleucos	Grey Falcon		E	-	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
Gallinago hardwickii	Latham's Snipe		V	V	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 subject land does not provide any potential habitat for the species and it would not occur there.	No
Grantiella picta	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
Lathamus discolor	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
Neophema chrysogaster	Orange-bellied Parrot		CE	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 (Helichrysum pumilum). 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 (Cakile maritima). They also eat various coastal native and introduced grasses. There is no habitat for the species within the study area.	No
Neophema chrysostoma	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
Pachycephala olivacea	Olive Whistler		V	-	This species is usually associated with moist tall forests at high elevations but has been occasionally recorded at lower altitudes. Breeding occurs above 300m within habitats providing both a thick understorey and moderate canopy. In the alps the species is more typically associated with subalpine woodlands with a heathy understorey. It is likely that the species would occur within the study area from time to time.	Potential
Petroica rodinogaster	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
Petroica boodang	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
Petroica phoenicea	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.	Potential
Pycnoptilus floccosus	Pilotbird		V	V	The Pilotbird occurs in temperate wet sclerophyll forests and occasionally temperate rainforest, where there is dense undergrowth with abundant	Potential

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					debris. Pilotbirds are known from the Thredbo Resort area and may occur within the study area from time to time.	
Rostratula australis	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
Stagonopleura guttata	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						
Hirundapus caudacutus	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
Merops ornatus	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
Monarcha melanopsis	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

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
Myiagra cyanoleuca	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
Neophema chrysogaster	Orange-bellied Parrot		CE	CE, M	SEE DIURNAL BIRDS ABOVE	No
Rhipidura rufifrons	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
Xanthomyza phrygia	Regent Honeyeater		CE	CE, M	SEE DIURNAL BIRDS ABOVE	No
Gallinago hardwickii	Latham's Snipe		V	V, M	Resides in swamps, dams and nearby marshy areas that contain grasses, lignum, low scrub or open timber that provides cover. It is considered highly unlikely that the species would occur within the study area.	Unlikely
Motacilla flava	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

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

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

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

- *Mastacomys fuscus* (Broad-toothed Rat)
- *Cercartetus nanus* (Eastern Pygmy-possum)
- *Callocephalon fimbriatum* (Gang-gang Cockatoo)
- *Petroica phoenicea* (Flame Robin)
- *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, particularly in association with the Montane Wet Tussock Grassland.

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 many records of the species from Kosciuszko National Park, mainly from lower altitudes and the northern parts of the park, 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 trail 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* (potential occurrence).

In New South Wales, the Gang-gang Cockatoo is distributed from the southeast coast to the Hunter region, and inland to the central and southern tablelands and southwest 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* (potential 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 Mountain Ash forest which occurs approximately 160 m upstream of the study area (MGP 1996). 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 proposal will affect a small amount of potential foraging habitat for the species, it will not affect breeding given the species demonstrated high fidelity with preferred breeding habitats.

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 (0.88 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. 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 0.88 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 0.88 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 0.88 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 as cats or foxes are already present in the landscape and are subject to control programs within the resort.

Matters to be addressed	Impact
	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 substantially 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: *a. lead to a long-term decrease in the size of an important population of a species*. 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. *b. reduce the area of occupancy of an important population* It is highly likely that the Pilotbird will continue to occur within the study area after the implementation of the proposed action. *c. fragment an existing important population into two or more populations* The proposed action will not fragment an existing important population of the Pilotbird into two or more populations. *d. adversely affect habitat critical to the survival of a species* No habitat within the study area is considered to be critical to the survival of the Pilotbird. *e. disrupt the breeding cycle of an important population* The proposed action and affected area is too small to disrupt the breeding cycle of a population of the Pilotbird. *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 not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the Pilotbird is likely to decline. *g. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat* The proposed action will not result in invasive species that are harmful becoming established in habitat for the Pilotbird. *h. interferes substantially with the recovery of the species.* 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.

Matters to be addressed	Impact
(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.

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