Statement of Environmental Effects

Playground Mountain Bike Trail

Address: Thredbo Alpine Resort, 2 Friday Drive, Thredbo NSW 2625

January 2024

Kosciuszko Thredbo Pty Ltd
1 Friday Drive, Thredbo, New South
Wales 2625
www.thredbo.com.au

Document Control

Version	Date	Revision Type	Author	Approved by
A	28/11/2023	Draft	C.Chalk	K.Delpit
0	10/01/2024	Final	C.Chalk	K.Delpit

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Executive Summary

Summary of the Development Application	
Development Proposal	This Statement of Environmental Effects (SEE) has been prepared to support the Development Application (DA) for the Playground Mountain Bike Trail (the Development) within Thredbo Alpine Resort. This application is seeking approval for the following works: • Vegetation clearing; • Construction of mountain bike trail, including earthworks; and • Rehabilitation works.
Site Details	**Lot Description**: Lot 876/DP 1243112
	Location within resort: Cruiser area
	Zoning: Kosciuszko National Park (C1: National Parks and Nature Reserves)
Applicant	Kosciuszko Thredbo Pty Ltd
Key Planning Considerations	The proposed development is subject to the requirements of the *State Environmental Planning Policy (Precincts – Regional) 2021* (Precincts – Regional SEPP). As such, the Department of Planning and Environment (DPE) Minister for Planning is the consent authority for the DA. The Development has been assessed against the relevant requirements of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act), *Environmental Planning and Assessment Act 1979* (EP&A Act), *National Parks and Wildlife Act 1974* (NPW Act)*, Biodiversity Conservation Act 2016* (BC Act), *Water Management Act 2000* (WM Act) and associated statutory instruments.
Key Environmental Matters	The Development is not located within waterfront land. The Development is considered to have low potential to impact on unrecorded Aboriginal objects or sites. The Development has been sited to avoid constrained areas such as higher conservation significance vegetation communities and land mapped on the BV Map. As such, the Development will not trigger the BOS, as it will not affect any land identified on the BV map and the total clearing of native vegetation associated with the proposal will not exceed the 1 ha threshold which applies to the Thredbo Resort area. The assessment of the effects of the Development on threatened species, populations and ecological communities which may be directly or indirectly affected by the Development concluded that the Development is unlikely to have a significant effect on threatened species, populations or ecological communities or their habitats (ELA 2023). The assessment of the Development against the MNES Significant Impact Guidelines, 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. The Development will not cause any significant adverse impacts to the surrounding landscape characteristics or visual amenity. The Development will have positive impacts on the existing social and economic environment through the provision of a sustainable trail section which can be experienced by a range of mountain bikers of varying ability. The impacts of the Development are considered to be largely positive. With the implementation of appropriate mitigation and management measures during construction and operation, the environmental impacts are considered acceptable. Therefore, the Development is considered suitable for the site and within the public interest.

1 Introduction

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

This application is seeking approval for the following works:

- vegetation clearing;
- construction of mountain bike trail, including earthworks and installation of signage; and
- rehabilitation works.

The site is located within Thredbo Alpine Resort (Thredbo) in Kosciuszko National Park (KNP), approximately 35 kilometres (km) south-west of Jindabyne, New South Wales (NSW).

Development in NSW alpine resort areas is governed by the *State Environmental Planning Policy (Precincts – Regional)* 2021 (Precincts – Regional SEPP). The Department of Planning and Environment (DPE) Minister for Planning is the consent authority for development in the alpine resort areas under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This SEE has been prepared in accordance with the relevant statutory requirements.

The Development is not integrated development.

The purpose of this SEE is to:

- describe the proposed development in relation to the existing environment;
- evaluate the proposed development against the relevant statutory planning framework; and
- assess the following key issues in relation to the proposed development –
    - the impacts of the development on the natural, human and built environment and how these impacts have been identified.
    - mitigation and management measures that will be taken to protect the environment or to reduce expected environmental harm.
    - any specific matters identified by the Secretary of DPE.

1.1 Supporting Documentation

Document	Title	Author / Prepare by	Document Reference
Flora and Fauna Assessment	Flora and Fauna Assessment – Playground MTB Trail Thredbo Alpine Resort	Eco Logical Australia Pty Ltd	Version 2
Site Environmental Management Plan	Site Environmental Management Plan, Playground Mountain Bike Trail	Kosciuszko Thredbo Pty Ltd	0
Cost Estimate Report	Cost Estimate Report, Playground Mountain Bike Trail	Kosciuszko Thredbo Pty Ltd	09 January 2024

2 Site Context and Analysis

2.1 Regional Context

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 Local Government Area (LGA) (**Figure 1**).

2.2 Local Context

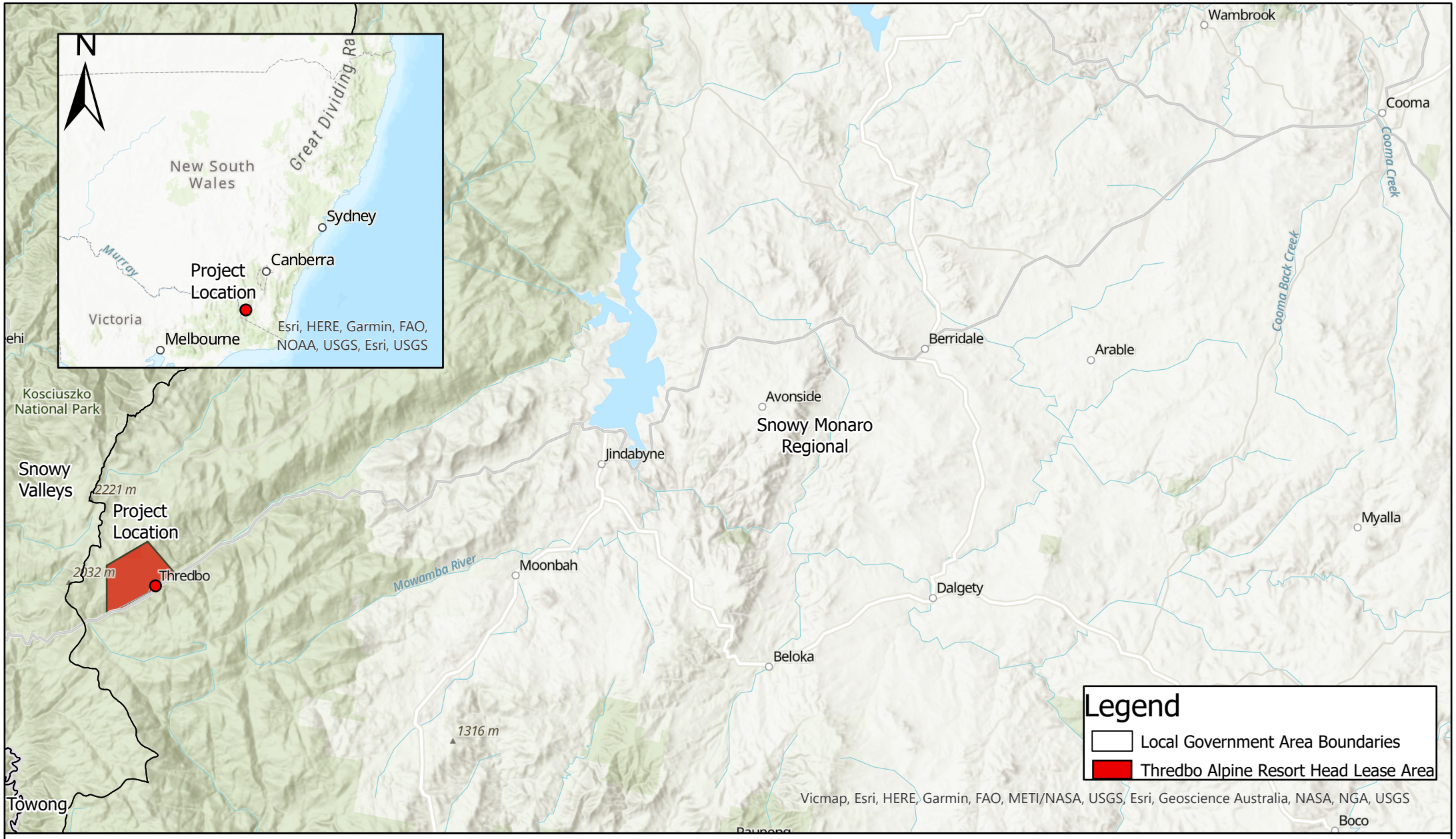
The Development site is located within the Cruiser ski area adjacent to/below the Cruiser chairlift within the Playground ski run. Easy Rider, Paparazzi and Grasshopper MTB trails are located within close proximity of the site. The site is within the Thredbo Head Lease Area on land formally described as Lot 876 DP1243112 (**Figure 2**).

2.3 Zoning

The site is zoned as C1 – National Parks and Nature Reserves under the *Snowy River Local Environmental Plan 2013* (NSW Government 2023a).

2.4 Present and Previous Land Uses

The Development is located within a predominately disturbed site comprising ski runs, parts of the former Lower All-mountain trail alignment and a mix of native and exotic vegetation. Surrounding land uses/infrastructure include mountain bike trails, lifting infrastructure, snowmaking infrastructure, ski runs, roads and access tracks.



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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

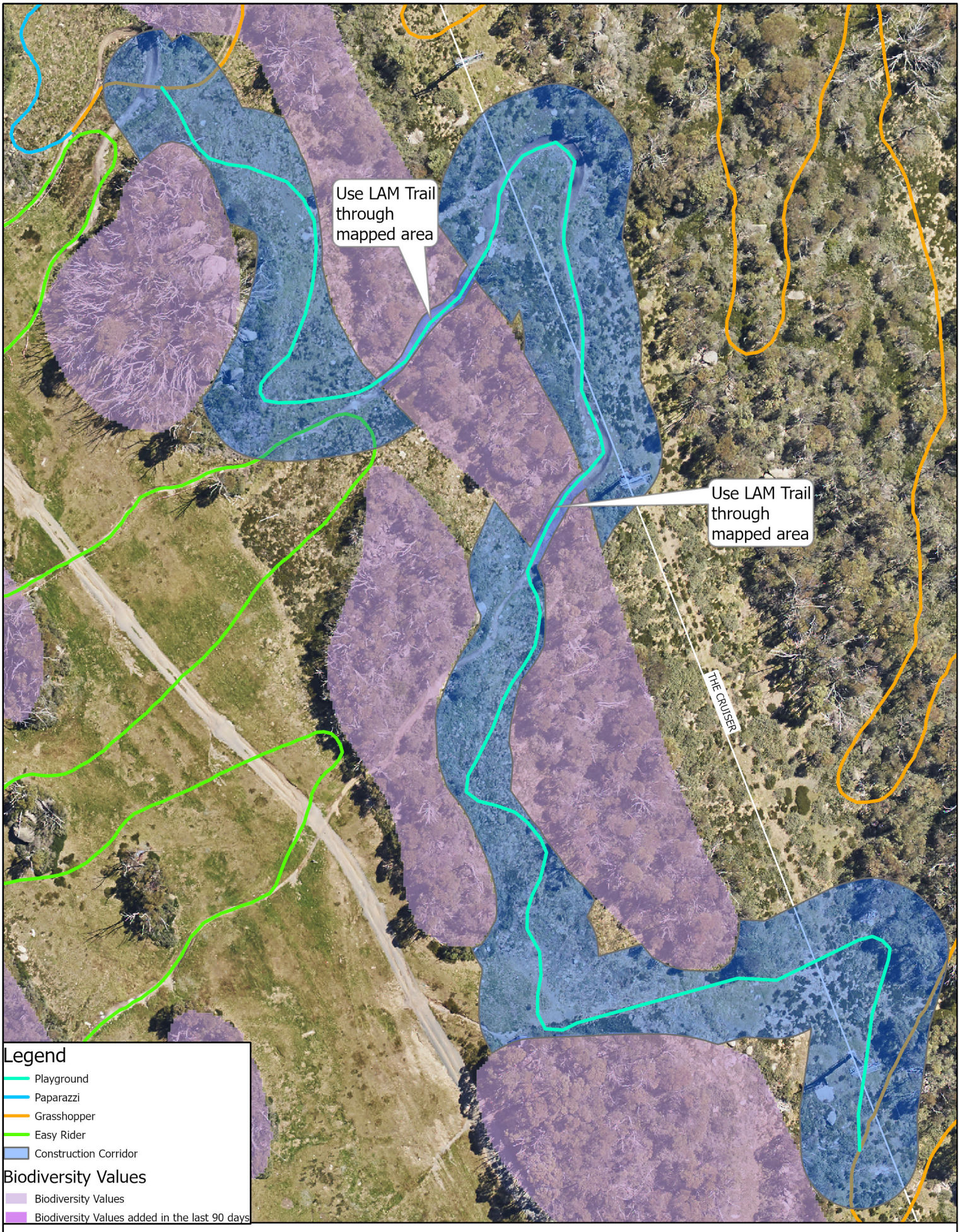
THREDBO

FIGURE 1: REGIONAL SITE CONTEXT

Revision: A

Date: 7/06/2022

Produced By: KO



Scale: 1:815

5.5 2.750 5.5 11 16.5 22

Meters

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

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THREDBO

SITE PLAN

Project: Playground

Revision: 2

Date: 20/10/2023

Produced By: BB

3 Project Description

3.1 Background

Thredbo has long been associated with mountain biking in the Snowy Mountains region of NSW. As Australia's premier biking destination with lift accessed gravity trails, Thredbo has continued to attract both recreational and competitive mountain bikers to the resort since the early 1990s. Each year KT hosts a series of competitions and events, such as the Cannonball Mountain Bike Festival, Gravity Series and Australian Mountain Biking Interschools.

Thredbo's future trail construction is focused on improving maintenance, sustainability and rideability for existing trails while also designing new trails that promote these initiatives. Our current network comprises of mostly beginner and intermediate "flow style" trails with banked turns, rolling terrain and predictable surfaces. To enhance and diversify our trail network we are adding different styles of trails into our network, catering to different types of riders and their needs. Additionally, KT are continuing to create interconnecting trails or "nodes" off the existing network as it creates more interesting riding, allows for better trail maintenance and access thus increasing sustainability of the entire network.

3.2 Purpose of Development

The current network of trails accessed by the Cruiser chairlift has one beginner and three intermediate flow style trails. The Development is designed to increase levels of speed, incorporate jumps and technical features. The Development will be an intermediate (blue) trail that incorporates a combination of flow, freeride and park styles of trail design. The trail will have greater technical sections, including speed, rhythm and banked turns, but will mainly be focused on jumps to promote skill development and progression. The new trail will contribute to diversifying our trail network and creating a better riding experience for guests.

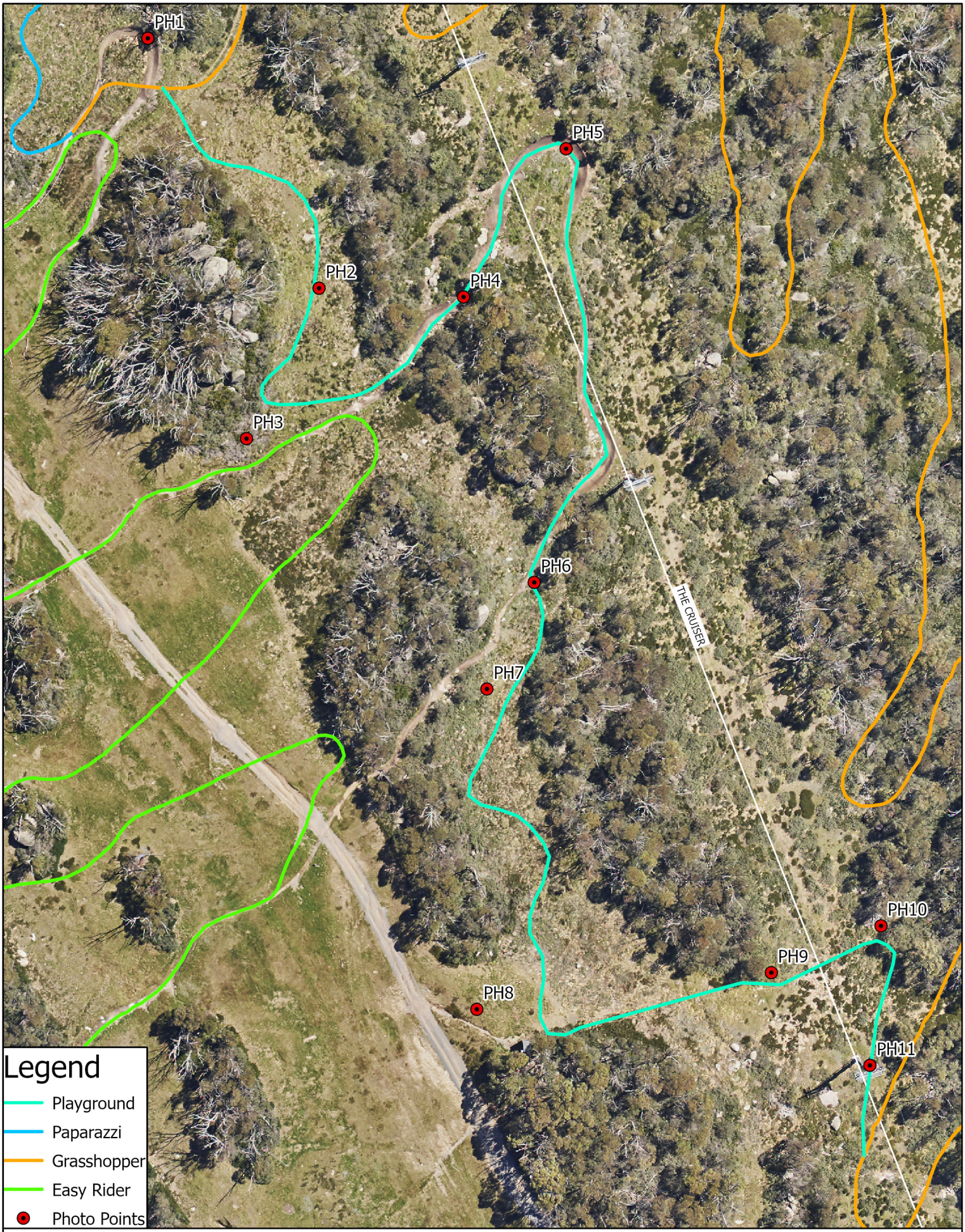
As the new trail will interconnect with Grasshopper (approved in 2022 under DA 21/11529) and Paparazzi (approved in 2022 under DA 21/16265) it will act as an additional node in this area. As with all interconnecting trails, the new trail will contribute to a better riding experience, increase sustainability of the trail network, and allow for more effective trail maintenance in the area. In addition, interconnecting trails also gives emergency response / patrollers the ability to close sections of trails and divert riders to other nodes when required. This in turn, allows for safer and more effective extraction of injured riders.

3.3 Project Timing

Construction of the Development is anticipated to commence in February 2024.

3.4 Overview of Trail

The trail commences approximately 19 m after the junction of Grasshopper and Paparazzi and continues downhill onto Playground ski run. This ski run has high volume of snow in winter due to drifting and is rarely accessed by grooming machines or snowmobiles. The trail heads east utilising a section of the previous alignment of the Lower All-Mountain (LAM) trail and continues under the Cruiser lift line on a previous section of the LAM trail and then proceeds downhill back onto Playground ski run following contours into multiple berms. The trail crosses the Cruiser lift line again before joining back onto Grasshopper. Site photos points are shown on **Figure 3**, and photos and a description of the trail in these locations is provided in **Table 1**.



Scale: 1:815

5.5 2.750 5.5 11 16.5 22

Meters

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

N

THREDBO

PHOTO POINTS

Project: Playground

Revision: 1

Date: 20/10/2023

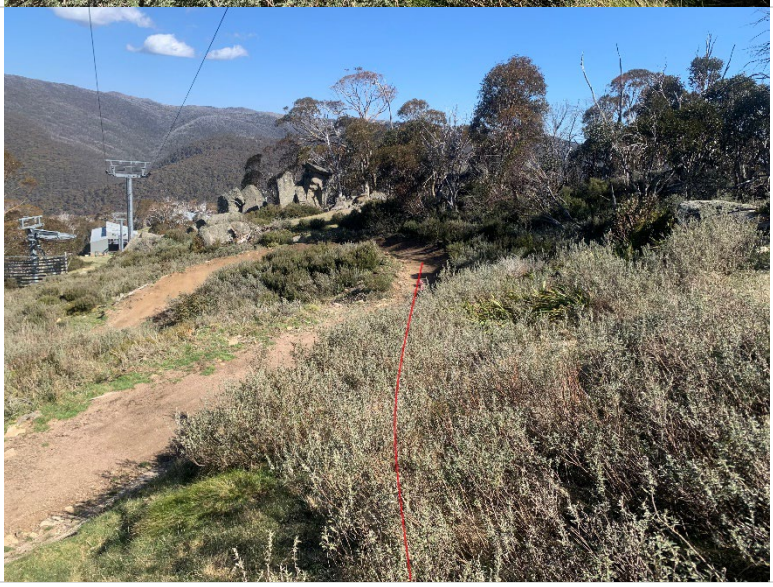
Produced By: BB

Table 1: Description and Site Photos

Trail Description	Site Photos
Photo 1: The trail commences at the junction of Paparazzi and Grasshopper trails and descends down the Playground ski run.	
Photo 2: The trail descends down Playground ski run into a berm above Easy Rider trail.	
Photo 3: The trail exits the berm heading east towards the existing LAM trail.	

Photo 4: The trail utilises a section of the former LAM trail alignment.	
Photo 5: The trail descends down a section of the former LAM trail alignment below the Cruiser chairlift.	
Photo 6: The trail traverses the Playground ski run.	

Photo 7: The trail traverses Playground ski run below a section of the former LAM trail alignment.	
Photo 8: The trail heads into a berm in the clearing between Lower Walkabout and Playground ski runs.	
Photo 9: The trail traverses below the Cruiser lift line into a berm.	

Photo 10: The trail heads into a berm then crosses back under the Cruiser lift line.	
Photo 11: The trail traverses below the Cruiser lift line and rejoins the Grasshopper trail.	

3.5 Trail Design and Construction Techniques

3.5.1 Trail Options Analysis

A preliminary site assessment was undertaken by key Project personnel (i.e. Project Manager, MTB trail designer, Environmental Officer and independent ecologist) 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 assessment 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. The preferred alignment was chosen to utilise sections of the former LAM trail to avoid/minimise further environmental impact within areas mapped on the BV Map.

On 16 November 2023, representatives from DPE and National Parks and Wildlife Service (NPWS) were provided the opportunity to walk the alignment and provide feedback on the proposal. NPWS provided the following comment via email on 23 November 2023 regarding the Development:

"Based on our site visit, if the development application utilises the existing trails in the BV mapped areas and addresses the standard issues that MTB trails raise, then we do not see a reason that we would be unsupportive".

3.5.2 MTB Trail Design and Construction Techniques

The MTB trail design and construction techniques have been developed with consideration of the following:

- Criteria outlined in Chapter 4 of the *Guidelines for a Quality Trail Experience: Mountain Bike Trail Guidelines* (IMBA 2018) (IMBA MTB Guidelines);
- Sections 6 and 7 of the *Trail Difficult Rating System – Build* (IMBA 2012);
- *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); and
- 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.

3.5.2.1 MTB Trail Design

A summary of the trail design is provided in **Table 2**. Examples of trail design elements are provided in **Appendix B**.

Table 2: Trail Design

Element	Details
Trail length	412 m
Trail difficulty rating	In accordance with the IMBA Trail Difficulty Rating System (IMBA 2012), the trail difficulty rating is Intermediate.
Trail tread width	The tread refers to the actual surface of the trail upon which users travel. The average trail tread width will be 600 mm which is in accordance with the Trail Difficulty Rating System Land Managers Guide (IMBA 2012) (**Appendix A**).
Trail corridor width	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. 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. *Flexible trail corridor* A 20 m wide corridor is required to provide flexibility for the trail builders to respond to any unforeseen construction constraints (e.g. during excavation the uncovering of a large amount of rock just beneath the surface).
Trail type	One-way (descending) – This design component is a key risk management technique to minimise the likelihood of head-on collisions between riders.
Tread surface	The trail surface will be predominately natural soil, with local crushed granodiorite used where required. The surface will comprise possible sections of rocky or loose tread.
Natural Obstacles and Technical Trail Features (TTFs)	The trail will comprise a mix of natural obstacles and TTFs, such as rocks and jumps.
Average trail grade	The climbs and descents will be mostly moderate gradients but may include steep sections. The average trail grade will be 10 % or less (IMBA 2012) (**Appendix A**).

Maximum trail grade	The trail grade will be a maximum of 20 % or greater (IMBA 2012) (**Appendix A**).
Trail Signage	Trail signage is installed to clearly mark the trail, inform users of their responsibilities, aid in navigation and provide key information. *Decision Point Signs* Decision point signs generally comprise posts with information in relation to important departure and destination locations along the trail. The signs generally include the following information: • name of the new trail departing from that point; • difficulty symbol (e.g. green circle, blue square, black diamond – the number on this symbol correlates to the trail descriptions on the Thredbo Mountain Bike Park Map; • trail type (e.g. flow, technical, shared, permitted/prohibited use); • arrow indicating the direction of the new trail; and • trail network logo. The signs are 400 mm wide x 200 mm high and attached to a 50 mm round post which is 1,800 mm high. Standard signage plans are provided in **Appendix C**.

3.5.2.2 MTB Trail Construction Techniques

A summary of the construction techniques to be used for the Development is provided in **Table 3**. Examples of construction techniques are provided in **Appendix B**.

Table 3: Summary of Construction Techniques

Construction Technique	Details
Slope contour building	The trail should be built on a side slope, aligned along the contours of the hillside (as demonstrated in **Appendix B**). The most sustainable trails are those that have a low overall grade (<10 % or a one in 10 change in elevation) and frequent undulations, which will ensure water flows across and not along the trail.
Partial or full bench-cut construction	Trails built on sloping ground require excavation to achieve a partial or full bench construction. *Partial bench* 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* 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.
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 (refer **Appendix B**). The trail should slope gently (no greater than 5 %) down towards the lower, outside edge. It is noted that completely outsloping trails will not provide enjoyable and safe trails.
Rock / tread armouring	Rock / tread 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. Although armouring hardens the trail tread, all the principles of

	sustainable trail design still apply as it is essential that water is prevented from following down or under that section of trail (refer **Appendix B** for example).
Half rule	A trail's grade shouldn't 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. If the trail grade is steeper than half the grade of the side-slope, it is considered a fall-line trail (IMBA 2012).
10 % rule – average trail grade guideline	Generally, an average trail grade of 10 % or less is the most sustainable (IMBA 2012). The 10 percent rule is based on experience an industry best practise which has shown a grade of less than 10 percent is most sustainable; It applies to most soil types, minimises user caused erosion, allows for design flexibility, accommodates undulations, and allows for realignments above or below features (AusCycling 2019).
Grade dips and reversals	A reverse in the trail grade, usually a short dip followed by a rise, creating a small watershed and forcing the water off the trail. Grade reversals make trails more enjoyable and provide excellent drainage solutions. A grade reversal is the change in trail tread grade from up to down as the trail moves across the side slope. Grade reversals allow water to leave the trail at the low point of the grade reversal before it can gain enough speed and volume to cause erosion. Grade reversals divide the trail into continuous small watersheds. This means the drainage feature of one part of the trail won't affect another section, which reduces erosion (AusCycling 2019).
Rolling grade and knicks	A knick is a shaved down section of trail, semicircular in shape and about 3 m in diameter, with the centre of the knick outsloped at about 15 % to draw the water off the trail. Rolling grade dips build on the knick feature. The knick is built and followed by a long gentle soil ramp. Rolling grade dips require little maintenance and create effective drainage (AusCycling 2019).
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.
Berms or insloped turns	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.

3.6 Construction Activities

Pre-construction activities will comprise:

- establishment of site boundary;
- marking significant vegetation to be retained and no-go zones;
- erection of site signage and traffic controls;
- flagging exact trail alignment using pin flags to mark the edges of the trail for construction; and
- mobilisation of machinery, equipment and construction materials to site.

Construction activities will comprise:

- vegetation clearing (50 m increments) within the trail corridor to expose bare earth
    - excess cut vegetation to be spread into the surrounding heath and used for rehabilitation of exposed soil on the trail edges
    - topsoil and vegetation sods are to be stockpiled close to the trail tread;
- cut into the slope using a mini excavator and excavate the soil to achieve the appropriate depth of bench;
- remove loose rocks, roots and compact the trail;
- back slope the batter, ensuring outslope and appropriate drainage;
- define the trail line using rocks, logs and other obstacles; and
- re-instate the verge areas, topsoil and preserved vegetation sods.

Post-construction activities will comprise:

- rehabilitation in accordance with the Rehabilitation and Monitoring Plan;
- demobilisation of plant and machinery; and
- site clean-up.

3.7 Construction Management Details

Construction management details, including project management, site access, waste management, vehicles, machinery and equipment, stockpiling and material storage areas etc. are provided in the Site Environmental Management Plan (SEMP) (**Appendix F**).

3.8 Operational Activities

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, Policies, Plans and Guidelines

4.1 Legislative Review

A review of key legislation and planning instruments applicable to the Project is provided in **Table 4**.

Table 4: Legislative Review

Acts & Planning Instruments	Summary
Commonwealth	
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The 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 listed under the EPBC Act without approval from the Australian Government for the Environment. Refer to **Section 6.4** for the assessment of Matters of National Environmental Significance (MNES).
State	
Environmental Planning and Assessment Act 1979 (EP&A Act) Environmental Planning and Assessment Regulation 2021 (EP&A Regulation)	The EP&A Act is the primary piece of legislation governing development within NSW. DPE assesses development proposals within NSW alpine resort areas where the Minister for Planning is the consent authority under Part 4 of the EP&A Act. Refer **Section 4.2.1** for matters to be considered. This SEE has been prepared in accordance with the requirements of the EP&A Regulation. Throughout the planning and design phases of the Development, KT has considered the principles of ESD.
National Parks and Wildlife Act 1974 (NPW Act) *National Parks and Wildlife Regulation 2019*	The objects of the NPW Act include: • the conservation of nature; • the conservation of objects, places or features (including biological diversity) of cultural value within the landscape; • fostering public appreciation, understanding and enjoyment of nature and cultural heritage and their conservation; and • providing for the management of land reserved under the Act in accordance with the management principles applicable for each type of reservation. As detailed in this report, appropriate environmental mitigation and management measures are proposed to ensure the Project results in acceptable environmental impacts. The NPW Act provides that a person who exercises due diligence in determining that their actions will not harm Aboriginal objects has a defence against prosecution if they later unknowingly harm an object without an Aboriginal heritage impact permit. A due diligence assessment has been undertaken in **Section 6.4.2**.
Biodiversity Conservation Act 2016 (BC Act) Biodiversity Conservation	The purpose of the 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 Development is consistent with principles of ESD, as demonstrated in the subsequent sections of this report.

Regulation 2017 (BC Regulation)	The BC Regulation sets out threshold levels for when the Biodiversity Offsets Scheme (BOS) will be triggered. The threshold has two elements: • whether the amount of native vegetation being cleared exceeds the area threshold; and • whether the impacts occur on an area mapped on the Biodiversity Values Map (BVM). If clearing and other impacts, including biodiversity impacts prescribed by Clause 6.1 of the BC Regulation, exceed either trigger, the BOS applies. The BOS also applies when: • the 'test of significance' in section 7.3 of the BC Act identifies that the development or activity is likely to significantly affect threatened species or ecological communities, or their habitats; or • the works are carried out on a declared area of outstanding biodiversity value. The Development will not trigger the BOS.
Environmental Planning Instruments	
State Environmental Planning Policy (Precincts – Regional) 2021 (Precincts – Regional SEPP)	The aim and objectives of the Policy for Kosciuszko National Park and alpine resorts (Chapter 4) are: • to encourage the carrying out of a range of development in the alpine resorts that do not result in adverse environmental, social or economic impacts on the natural or cultural environment; • provide planning controls to encourage ESD; and • minimise the risk of community exposure to environmental hazards within the alpine resort areas. Development in NSW alpine resort areas are governed by the Precincts – Regional SEPP. Key requirements are addressed in **Section 4.2.2**.

4.2 Planning Framework

An assessment against the relevant matters of the EP&A Act and relevant environment planning instruments, policies and plans is provided in this section.

4.2.1 Environmental Planning and Assessment Act 1979

In accordance with Section 4.15 of the EP&A Act, the consent authority is to consider the matters outlined below.

(1) Matters for consideration – General	**Consideration**
the provisions of—	
(i) any environmental planning instrument	The Precincts – Regional SEPP is the only environmental planning instrument which applies to the site. An assessment against the relevant sections of the Precincts – Regional SEPP have been addressed in **Section 4.2.2**.
(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	Not applicable to the Development.

making of the proposed instrument has been deferred indefinitely or has not been approved)	
(iii) any development control plan	Not applicable to the Development.
(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 to the Development.
(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 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 **Section 6.**
(b) the suitability of the site for the development	The site is suitable for the Development, refer **Section 2**.
(c) any submissions made in accordance with this Act or the regulations	-
(d) the public interest.	The Development is considered to be within the public interest for the following reasons: • The Development is consistent with the aim and objectives of the Precincts – Regional SEPP. • The Development is compatible with the site. • The Development will not have any significant adverse environmental impacts. • The Development is consistent with the principles of ESD. • The Development will contribute to tourism and recreation opportunities in Thredbo resort.

4.2.2 Precincts – Regional SEPP

The relevant sections of Chapter 4 (Kosciuszko National Park and alpine resorts) of the Precincts – Regional SEPP are addressed in this section.

4.2.2.1 Section 4.7 – Land Use Table (Thredbo Alpine Resort)

In accordance with the Land Use Table in Section 4.7 of the Precincts – Regional SEPP, 'recreation infrastructure' is permissible with consent within the Thredbo Alpine Resort.

Recreation infrastructure is defined as: '*infrastructure provided for the purposes of active or passive recreation for tourists, including walking trails, mountain bike trails, directional signage, cross country*

ski trails and oversnow routes'. The Development is for the purpose of 'mountain bike trails' which falls under this definition, therefore is permissible with consent.

4.2.2.2 Section 4.21 – Heritage conservation

Section 4.21 Heritage conservation	Consideration
(1) The objective of this section is to conserve— (a) the environmental heritage of the Alpine Region, and (b) the heritage significance of heritage items, including associated fabric, settings and views, and (c) Aboriginal heritage items and Aboriginal places.	The Development will not impact upon any heritage items or Aboriginal heritage items or places.
(2) Development consent is required for the following in the Alpine Region— (a) demolishing or moving a heritage item, (b) altering a heritage item, including by doing the following to a heritage item that is a building— (i) making changes to the detail, fabric, finish or appearance of the building's exterior, (ii) making structural changes to the building's interior, (c) disturbing or excavating land that is, or contains, an Aboriginal heritage item, (d) erecting a building on land that is, or contains, a heritage item, (e) subdividing land that is, or contains, a heritage item.	Not applicable to Development.
(3) Development consent is not required under this section for the following development— (a) development that involves only the removal of a tree or other vegetation that the consent authority is satisfied is a risk to human life or property, (b) exempt development, (c) development that does not require development consent under section 4.14.	Not applicable to Development. The Development will not impact upon any heritage items or Aboriginal heritage items or places.
(4) The consent authority may, before work is carried out, give written notice to an applicant for development consent that development consent is not required under this section if the consent authority is satisfied the development— (a) is of a minor nature or is for the maintenance of the heritage item, and (b) the development will not adversely impact the heritage significance of the heritage item.	Not applicable to Development. The Development will not impact upon any heritage items.

(5) In deciding whether to grant development consent for development under this section, the consent authority— (a) must consider the effect of the development on— (i) the heritage significance of the heritage item, and (ii) Aboriginal objects known or reasonably likely to be located on the land, (b) may require the submission of a heritage conservation management plan, and (c) for development on land that is, contains or is near a heritage item— may require the preparation of a heritage impact statement.	Not applicable to Development. The Development will not impact upon any heritage items or Aboriginal heritage items or places.
(6) Development consent must not be granted to development on land that is, or contains, an Aboriginal heritage item, and that requires development consent under this section, unless the consent authority has— (a) given written or other appropriate notice of the development to the local Aboriginal communities, and (b) considered responses received from the communities within 28 days after the notice is given.	Not applicable to Development, no Aboriginal heritage items identified within the site.

4.2.2.3 Section 4.24 Flood planning

Section 4.24 Flood planning	**Consideration**
(1) The objectives of this section are as follows— (a) to minimise the flood risk to life and property associated with the use of land, (b) to allow development on land that is compatible with the flood function and behaviour on the land, taking into account projected changes as a result of climate change, (c) to avoid adverse or cumulative impacts on flood behaviour and the environment, (d) to enable the safe occupation and efficient evacuation of people if there is a flood.	The Development site is not located in a flood planning area and is not subject to flooding.
(2) Development consent must not be granted to development on land in the Alpine Region the consent authority considers to be in the flood planning area unless the consent authority is satisfied the development— (a) is compatible with the flood function and behaviour on the land, and	The Development site is not located in a flood planning area and is not subject to flooding.

(b) will not adversely impact flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties, and (c) will not adversely impact the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area if there is a flood, and (d) incorporates appropriate measures to manage risk to life if there is a flood, and (e) will not adversely impact the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.	
(3) In deciding whether to grant development consent on land the consent authority considers to be in the flood planning area, the consent authority must consider the following matters— (a) the impact of the development on projected changes to flood behaviour as a result of climate change, (b) the intended design and scale of buildings resulting from the development, (c) whether the development incorporates measures to minimise the risk to life and ensure the safe evacuation of people if there is a flood, (d) the potential to modify, relocate or remove buildings resulting from development if the surrounding area is impacted by flooding or coastal erosion.	The Development site is not located in a flood planning area and is not subject to flooding.
(4) Words used in this section have the same meaning as in the Considering Flooding in Land Use Planning Guideline, published on the Department's website on 14 July 2021, unless otherwise defined.	-

4.2.2.4 Section 4.25 – Earthworks

Section 4.25 Earthworks	**Consideration**
(1) The objective of this section is to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.	The Development is consistent with the objectives of this section.

(2) Development consent is required for earthworks in the Alpine Region unless— (a) the earthworks are exempt development under this Chapter or another environmental planning instrument, or (b) the earthworks are ancillary to— (i) development permitted without consent under this Chapter, or (ii) development for which development consent has been given.	Earthworks form part of this Application seeking Development Consent.
(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) Adverse impact unlikely with the implementation of appropriate controls during construction (refer SEMP, **Appendix F**), and utilisation of sustainable trail building techniques. b) The Development is not anticipated to impact upon the redevelopment of the site. c) The excavated material will be reused onsite. The quality of the material is not expected to change. d) The adjoining land comprises of ski runs, lifting infrastructure, snowmaking infrastructure, mountain bike trails, roads and access tracks. The Development is not expected to affect the existing and likely amenity of adjoining land, refer to **Section 6.5.** e) No fill material is proposed. In the event fill material is required, it will be sourced in accordance with the requirements outlined in the SEMP (**Appendix F**). f) Likelihood of disturbing relics is low, refer **Section 6.4**. g) Impacts to waterways, drinking water catchments or environmental sensitive areas considered unlikely, refer **Section 6**. h) Refer **Section 7** for mitigation measures.

4.2.2.5 Section 4.28 – Consideration of master plans and other documents

Matters for consideration	**Consideration**
(1) In deciding whether to grant development consent to development in the Alpine Region, the consent authority must consider the following—	

(a) the aim and objectives of this Chapter set out in section 4.1,	The Development is consistent with the objectives of Chapter 4, as demonstrated in this report.
(b) (Repealed)	Not applicable to the Development.
(c) a conservation agreement under the Environment Protection and Biodiversity Conservation Act 1999 of the Commonwealth that applies to the land,	Not applicable to the Development.
(d) the Geotechnical Policy —Kosciuszko Alpine Resorts published by the Department in November 2003,	Refer **Section 4.4.5**.
(e) for development in the Perisher Range Alpine Resort— (i) the Perisher Range Resorts Master Plan, published by the National Parks and Wildlife Service in November 2001, and (ii) the Perisher Blue Ski Resort Ski Slope Master Plan adopted by the National Parks and Wildlife Service in May 2002.	Not applicable to the Development.
(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 Mountains Master Plan.
(b) if a master plan has not been approved—a draft master plan prepared under section 4.26 that is intended to apply to the land and has been published on the NSW planning portal.	Master Plan has been approved, see above.

4.2.2.6 Section 4.29 – Consideration of environmental, geotechnical and other matters

Matters for consideration	Consideration
(1) In deciding whether to grant development consent to development in the Alpine Region, the consent authority must consider the following—	No measures proposed to address geotechnical issues, refer **Section 4.4.5**.
(a) measures proposed to address geotechnical issues relating to the development,	The Development does not require any measures to mitigate environmental hazards that would impact on the conservation of the natural environment.
(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,	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 6.5**.
(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,	There is no framework to assess cumulative impacts within the Alpine Subregion. The impacts of the Development are addressed in **Section 6**. 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 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,	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 capacity of existing waste or resource management facilities to deal with additional waste generated by the development, including in peak periods.	The Development will not impact upon the capacity of existing waste or resource management facilities.
(2) For development involving earthworks or stormwater draining works, the consent authority must also consider measures to mitigate adverse impacts associated with the works.	Earthworks are proposed. Temporary drainage, erosion and sediment control measures will be implemented during construction to mitigate potential adverse impacts associated with earthworks (refer to the SEMP, **Appendix F**).
(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.	The Development will not alter the alpine resort character. The Development will contribute to sustainable year-round recreational opportunities.

4.3 Integrated Development

A review of the DPE Development referrals guide (2022) confirms the Development is not integrated development under Section 4.46 of the EP&A Act.

4.4 Plans, Policies and Guidelines

4.4.1 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 for the next 20 years. The region comprises nine (9) local government areas including Bega Valley, Eurobodalla, Goulburn Malware, Hilltops, Queanbeyan-Palerang, Snowy Monaro, Upper Lachlan, Wingecarribee and Yass Valley.

The Regional Plan identifies the following goals for new development with the region:

- A connected and prosperous economy;
- A diverse environment interconnected by biodiversity corridors;
- Healthy and connected communities; and
- Environmentally sustainable housing choices.

Direction 3 of the Regional Plan is to develop the Snowy Mountains into Australia's premier year-round alpine destination. The Regional Plan promotes well planned, efficient and sustainable development that complements the area's natural and cultural values.

The Development is consistent with the goals and objectives of the Regional Plan as it will contribute to meeting the demands of the growing mountain biking community in the area, leading to continued summer visitation in the resort.

4.4.2 Snowy Mountains Special Activation Precinct Master Plan

The Snowy SAP Master Plan sets out the vision, principles, and precinct-wide performance criteria to support the planning controls in three Environmental Planning Instruments (EPIs). The protection of the natural, cultural and social values of KNP is a primary focus of the Snowy Mountains Special Activation Precinct. As demonstrated in this SEE, the Development will result in acceptable environmental impacts. The Development has been designed to first avoid impacts on biodiversity, then minimise and mitigate impacts through a range of mitigation measures implemented during construction and operation. The Development will not adversely impact on any cultural values. The Development will contribute to the social values of KNP as it will contribute to an improved trail network within Thredbo.

4.4.3 Kosciuszko National Park Plan of Management

The KNP POM outlines objectives and management strategies to guide the long-term management of values within specific areas of KNP. The KNP POM includes several management zones, which comprise of seven management units that contain places and values of exceptional significance. Thredbo is included in the Thredbo Management Unit, considered an area of exceptional recreational significance. As such, the management provisions in Section 10 of the KNP POM applicable to this unit apply.

Section 8.11 of the KNP POM also recognises a range of cycling opportunities exist to encourage visitors to appreciate the values of KNP in ways that minimise adverse impacts, including permitting cycling on management trails, purpose-built cycling tracks, shared-use tracks and multiple-use trails within the Visitor Services Zone (including Thredbo Management Unit) subject to risk and environmental assessments and approval.

The cycling management objective in Section 8.11.1 of the KNP POM is to provide a range of cycling opportunities that encourages visitors to appreciate the values of the park in ways that minimise adverse impacts. The Development is a purpose-built cycling track which has undergone a comprehensive environmental impact assessment to avoid and minimise adverse impacts on existing environmental values. As such, the Development is consistent with the cycling management objective.

4.4.4 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 and aims to achieve the following outcomes:

- Increased contribution towards conservation of park values through growth in new markets that enjoy and value national parks;

- Environmentally sustainable, fit-for-purpose cycling opportunities that enhance or protect conservation, recreational, social and cultural values;
- Increased visitation including overnight stays to the Kosciuszko National Park and surrounding region; and
- Transparent and consistent assessment of new proposals to ensure they achieve the outcomes above.

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

4.4.5 Geotechnical Policy Kosciuszko Alpine Resorts

A review of the Geotechnical Policy Kosciuszko Alpine Resorts (DIPNR 2003) was undertaken to inform the planning of this Development. The site is not located within the designated "G" on the accompanying geotechnical maps for the Kosciuszko Alpine Resort areas, refer **Figure 4**.

The Development will comprise minor earthworks, not involving excavation or fill in excess of one metre in vertical height and no structures are proposed, 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.

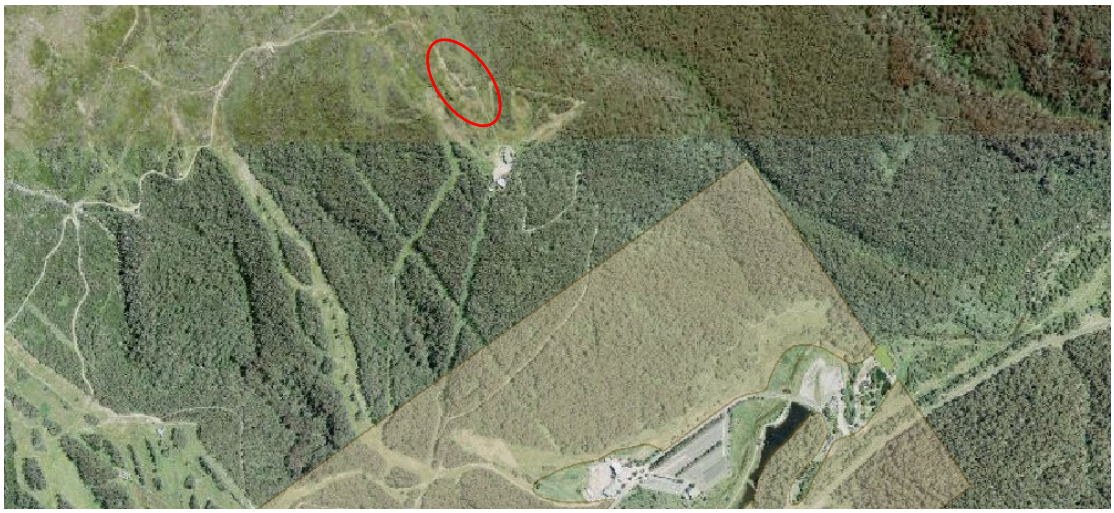


Figure 4: Geotechnical Policy, NSW Planning Portal Spatial Viewer (NSW Government 2023a)

5 Assessment Method

The assessment for the Development consisted of a desktop review of publicly available data sources and information. The desktop review was followed by a preliminary site assessment and subsequent field surveys carried out within the Project area to describe the environmental values present on the site and to aid the evaluation of potential impacts of the Project to those values. A summary of the assessment methods is provided in the following sections.

5.1 Desktop Assessment

A desktop assessment was carried out to identify relevant environmental values, that potentially occur within the Project area. Database and information sources that were utilised in the assessment include:

- NSW Planning Portal Spatial Viewer (NSW Government 2023a);
- Biodiversity Values Map and Threshold Tool (NSW Government 2023b);
- NSW BioNet (NSW Government 2023c);
- Water Management (General) Regulation 2018 hydroline spatial data 1.0 (NSW Government 2023d);
- Protected Matters Search Tool (DCCEEW 2023); and
- Aboriginal Heritage Information Management System Web Services (Heritage NSW).

5.2 Technical Assessments

A Flora and Fauna Assessment (ELA 2023) (**Appendix E**) has been prepared to support this application.

6 Impact Assessment

6.1 Land

6.1.1 Topography

The trail ranges from approximately 1,730-1,765 m AHD. The site is considered suitable for the Development, providing suitable terrain and natural features.

6.1.2 Soils and Disturbance

To create the trail form, earthworks comprising cut and fill are required using a mini excavator. The disturbance corridor will range from 2-3 m in width, containing the upper and lower batters and the trail surface when the trail is traversing across moderate to steep slopes. On gentler slopes the disturbance corridor will be closer to 1.5 m. The average disturbance width is expected to be 2.5 m.

Due to the nature of the works, the final trail alignment will not be rehabilitated. However, the Development will be constructed to effectively manage erosion and run-off in accordance with best practice environmentally sustainable trail design outlined in the IMBA Guidelines and AusCycling Guidelines.

The construction of the trail will incorporate key sustainable trail design concepts and construction techniques such as rolling contours, outslope, the half rule and 10% average guideline, use of frequent grade reversals and rock armouring (refer **Table 2** and **Table 3**) 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 a detailed rehabilitation and monitoring plan which will assist in achieving an erosion resistant state.

6.1.3 Land Use

The expansion of Thredbo's MTB trail network does not introduce any land uses which are not permitted under the head lease. The Development is consistent with surrounding land uses comprising recreation infrastructure.

6.2 Water

A review of the *Water Management (General) Regulation 2018 Hydro Line spatial data* (NSW Government 2018) and the *State Environmental Planning Policy (Kosciuszko National Park – Alpine Resort) 2007 Thredbo Alpine Resort, Sheet 1 of 5* (DoP 2006) confirms the Development is not located within 40 m of a watercourse (waterfront land), refer **Figure 5**. No unmapped watercourses were identified within proximity of the site during the site inspection. As such, no further assessment is required under the WM Act.

Source: Hydrolines (*WM (General) Regulation 2018* spatial data 1.0); Watercourses (Alpine SEPP, NSW DoP 2006)

Figure 5: Mapped Watercourses

Surface water diversion is an important component of trail construction. If not managed appropriately, water run-off could result in erosion of the trail surface and pooling of water resulting in soft boggy conditions for riders. During construction appropriate drainage controls will be implemented to divert and/or manage stormwater run-off entering and leaving the site. The incorporation of rolling contours, grade reversals and outsloping the trail will minimise the potential impacts associated with surface water run-off during operation of the trail.

6.3 Biodiversity

Proposed impacts to the biodiversity values of the site and surrounds have been assessed in the Flora and Fauna Assessment, refer to **Appendix E**.

6.4 Heritage

6.4.1 European Heritage

A review of the Precincts – Regional SEPP, NSW historic inventory and the Thredbo Alpine Village Conservation Plan, Vol.2 Inventory (Clive Lucas, Stapleton and Partners 1997) concluded no heritage items are located within the site. No further assessment is required.

6.4.1.1 National Heritage Place (MNES)

The Development site is located within KNP, forming part of the Australian Alps National Parks and Reserves (AANP) which were included on the National Heritage List on 7 November 2008 for their –

1) course or pattern of Australia's natural or cultural history;
2) possession of uncommon, rare or endangered aspects of Australia's natural or cultural history;
3) importance in demonstrating the principal characteristics of: (i) a class of Australia's natural or cultural places, or (ii) a class of Australia's natural or cultural environment.
4) importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
5) strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; and
6) special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history.

In total, three reserves, seven national parks and one wilderness area comprise the National Heritage Place.

To determine whether a referral and formal assessment is required for the Development, an assessment against the significant impact criteria in the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1* (DEE 2013) has been undertaken in **Table 5**.

Table 5: Significant Impact Assessment – Australian Alps National Parks and Reserves (AANP)

National Heritage Values of the AANP		Significant Impact Assessment
Criteria: An action is likely to have a significant impact on the National Heritage values of a National Heritage place if there is a real chance or possibility that it will cause: • one or more of the National Heritage values to be lost, • one or more of the National Heritage values to be degraded or damaged, or • one or more of the National Heritage values to be notably altered, modified, obscured or diminished.		
1)	The AANP are of outstanding landscape value and are important in the pattern of Australia's natural history, containing glacial and periglacial features, fossils, karst, biological heritage, moth feasting, transhumant grazing, scientific research, water harvesting and recreation. The AANP have outstanding heritage value for the longevity and diversity of its recreational use (Commonwealth of Australia 2008).	The Development will not impact on these values. The Development will contribute to the year-round recreational opportunities within KNP.
2)	The high-altitude peaks and plateaus, glacial lakes and alpine and sub-alpine ecosystems of the alps are rare in Australia's mostly flat, dry and hot continent. The AANP contain a vast range of mountain environments and plant communities adapted to cold climates including tall, wet, fern-filled forests to snowgum woodlands and open expanses of alpine meadows. The alps also contain landforms created by glaciers, remarkable fish fossils and unique fauna including Mountain Pygmy Possum (*Burramys parvus*) and Bogong moth (*Agrotis infusa*) (Commonwealth of Australia 2008; DAWE 2021).	The Development will not result in any significant adverse impacts on these values, refer to the Flora and Fauna Assessment for details.
3)	The AANP are listed for the north-east Kosciuszko pastoral landscape values which demonstrate the use of mountain resources, namely the summer grasses and herb fields. The landscape demonstrates the past grazing leases which convey the principal characteristics of transhumance and permanent pastoralism in a remote environment (Commonwealth of Australia	The Development is not located within the north-eastern area of KNP; therefore, it will not impact on these landscape values.

	2008). The area contains stockman's huts, homestead complexes, stock yards and stock routes which reflect 150 years of summer grazing on the alpine high plains (DAWE 2021).	
4)	The AANP is a powerful, spectacular and distinctive landscape and natural beauty. The mountain vistas, alpine streams and rivers, lakes, snow-covered eucalypts, high plain grasslands, summer alpine wildflowers, forests and natural sounds are highly valued by community groups (Commonwealth of Australia 2008; DAWE 2021).	The Development will not impact on these values.
5)	The AANP have a strong association with Australia's pioneering history, while the snowfields and national parks have long been popular recreation areas. Many community groups have a strong association with the alps for social and cultural reasons. The pioneering history of the high country is valued as an important part of the construction of the Australian identity featuring in myths, legends and literature. The mountain huts constructed for grazing, mining and recreation are valued by communities as physical expression of the cultural history of the region (Commonwealth of Australia 2008; DAWE 2021).	The Development will not result in any adverse impacts on these values.
6)	There is a long history of scientific research and endeavour in the AANP and its associated with the life or works of highly recognised persons such as Baron Ferdinand von Mueller (botanist), Eugen Von Guerard (artist), and writers/poets, Andrew Barton 'Banjo' Paterson, Elyne Mitchell and David Campbell (Commonwealth of Australia 2008; DAWE 2021).	The Development will not have any impact on the life or works of a person, or group of persons, of importance in Australia's natural or cultural history.

The Development will not cause any of the heritage values of the AANP to be lost, degraded, damaged or to be notably altered, modified, obscured or diminished.

6.4.2 Aboriginal Cultural Heritage

An assessment against the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010) is provided below.

Step in Due Diligence Process	**Comment**
1) Will the activity disturb the ground surface or any culturally modified trees?	The Development will result in ground disturbance.
2) Are there any: a. relevant confirmed site records or other associated landscape feature information on AHIMS? And/or b. Any other sources of information of which a person is already aware? And/or c. landscape features that are likely to indicate presence of Aboriginal objects?	A search of the Aboriginal Heritage Information Management System (AHIMS) was undertaken on 22 November 2023. The search results (**Appendix D**) identified no Aboriginal sites are recorded in or near site or surrounds. The site consists of steep terrain descending down the upper/mid slopes. Several historical independent assessments have been undertaken within the resort by Past Traces Heritage Consultants (2017), NGH Environmental (2017), Iron Bark (2013), and URS Australia Pty Ltd (2004; 2005), as well as more recent due diligence assessments undertaken for DA 21/11529 (Grasshopper MTB trail) and DA 22/9700 (Easy Rider MTB

		trail) within close proximity of the Development site. All studies concluded that the ski slope areas hold low potential for Aboriginal heritage sites. 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. No landscape features that are likely to indicate presence of Aboriginal objects were identified within the site. 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?	Not applicable

6.5 Landscape Character and Visual Amenity

The surrounding landscape comprises native vegetation, ski runs, snowmaking infrastructure, MTB trails, lifting infrastructure, roads and access tracks.

The Development will not significantly 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. Visual impacts are considered acceptable.

6.6 Operational Access

Chairlift access is via the Cruiser chairlift. From here riders will be able to access the new trail via Easy Rider or Paparazzi, refer **Figure 6**. Refer to the SEMP for construction access details and controls.

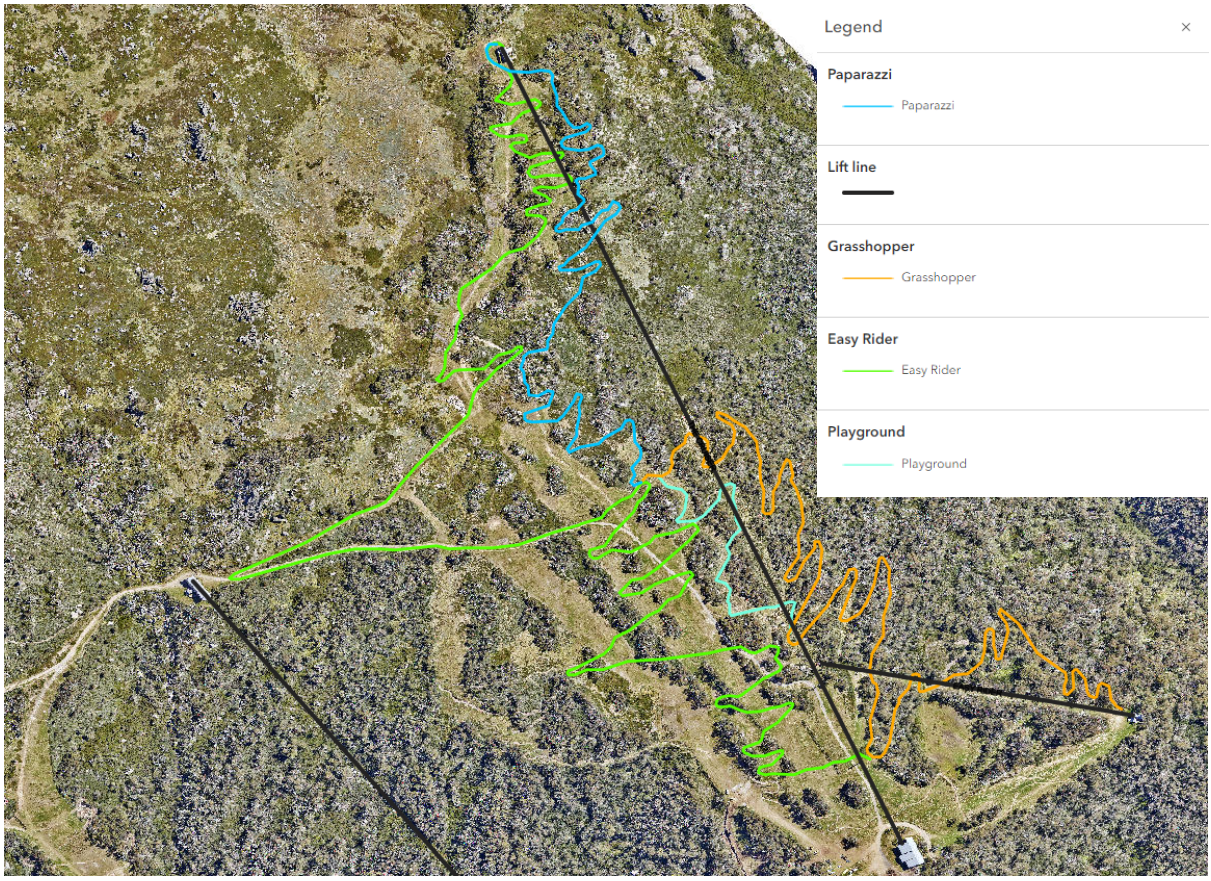


Figure 6: Integration with existing trail network

6.7 Air and Noise

6.7.1 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, there will be no impacts on the existing air quality from the Development.

6.7.2 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.

6.8 Socio-Economic

KT have been developing mountain bike trails within the resort since the 1990s. Consequently, the level of understanding of the existing landscape and industry will ensure that the trail is designed and constructed to comply with best practice environmentally trail design principles; and provides targeted mountain biking objectives and difficulty with consideration of the natural, social and operational setting.

KT design and developed trails to meet the needs of riders, provide opportunities for the public to connect with the environment, whilst minimising environmental impacts. Mountain biking is an activity with increasing participation rates worldwide. Mountain biking encompasses a broad spectrum of activities ranging from international level competition and extreme events to school sport programs and recreational riding. The addition of this trail to the Thredbo network will provide a new opportunity for riders to focus on jumps to promote skill development and progression. The new trail will contribute to diversifying our trail network and creating a better riding experience for guests.

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 broader range of mountain bikers and boost summer visitation. This in turn will create local business growth. The Development will also provide construction and ongoing operational jobs.

6.9 Matters of National Environmental Significance

A search of the EPBC Act Protected Matters Search Tool (PMST) (DCCEEW 2023) (records within a 5 km buffer of the site was undertaken on 22 November 2023 to determine whether any MNES are likely to occur within the site. The Protected Matters Report (PMR) (**Appendix D**) identified the five (5) categories (as listed under the EPBC Act) of MNES (**Table 6**) that may be relevant to the search area. The Development will not directly or indirectly affect Commonwealth land.

Table 6: Summary of MNES

MNES Categories	Comment
National Heritage Places	**Natural – Australian Alps National Parks and Reserves (AANP)** The Development is unlikely to cause one or more of the National Heritage values of the AANP to be lost, degraded, damaged or notably altered, modified, obscured or diminished, refer **Section 6.4.1.1**.
Wetlands of International Importance	The closest Wetland of International Importance is Blue Lake which is located more than 9 km north of the site, no further assessment is required.
Listed Threatened Ecological Communities (TECs)[2]	The Flora and Fauna Assessment (**Appendix E**) concluded the Development is unlikely to have a significant impact on any listed TECs.
Listed Threatened Species[2]	The Flora and Fauna Assessment (**Appendix E**) concluded the Development is unlikely to have a significant impact on any listed threatened species.
Listed Migratory Species[2]	The Flora and Fauna Assessment (**Appendix E**) concluded the Development is unlikely to have a significant impact on any listed migratory species.

[1]Number of MNES identified in the PMR (**Appendix D**)

[2]While based on some species records, the PMST relies on predictive modelling of suitable habitats and does not necessarily reflect an actual record of the species/community for a particular location.

7 Mitigation and Management Measures

Recommended mitigation and management measures to reduce potential impacts on the key values of the natural, built and human environment within the site and surrounds are provided below.

	Mitigation and Management Measures	Timing
General		
1	Prepare and implement SEMP prior to the commencement of construction activities.	Prior to and during construction
2	Prepare and implement Thredbo Mountain Bike Trail Management Plan, including trail maintenance and monitoring programs.	Prior to operation
3	All Project staff and contractors should undergo a site-specific induction which will cover environmental awareness training, environmental obligations and compliance requirements (e.g. limit of disturbance footprint and other environmental safeguards), emergency and incident response, reporting, and relevant procedures.	Prior to construction
4	The site will be temporarily fenced, roped or flagged to clearly delineate the construction area and no-go zones.	Prior to and during construction
Land and Water		
1	Appropriate drainage, erosion and sediment controls will be implemented at the site to minimise impacts to the water quality of run-off and the potential for sediment to leave the site.	During and post-construction, operation
2	Erosion and sediment controls to be inspected and maintained in accordance with the SEMP.	During construction, post-construction
3	All stockpiles will be managed in accordance with the Soil Stockpile Guidelines.	During construction
4	All storage of petroleum products, oils or chemicals to be in accordance with Australian Standards.	During construction
5	Refuelling procedures to be implemented to minimise spills of fuel products.	During construction
6	Progressive rehabilitation of disturbed areas to reduce erosion risks in accordance with the *Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park* (DECC 2007) (Rehabilitation Guidelines) and *Detailed Rehabilitation and Monitoring Plan.* Only weed-free straw or natural thatch/litter should be used in sediment control activities (ELA 2023).	During and post-construction
7	New signs to be located in existing disturbed areas or areas disturbed for construction of the Development.	During construction
8	The incorporation of sustainable design principles, such as following the contours of the hillside, outsloping, the half rule, the 10 % average guideline and use of frequent grade reversals will minimise erosion during operation of the trail.	During construction, operation
9	The incorporation of sustainable design principles, such as frequent grade reversals, avoidance of wet/boggy areas and installation of drainage crossings will assist in surface water diversion and minimise impacts on water quality.	During construction, operation
Flora and Fauna		

1	All disturbance should be kept to the minimum required to achieve the proposal (ELA 2023). No vegetation clearing is to occur within the Biodiversity Values Mapped areas. The trail is to utilise the existing Lower All Mountain trail corridor in these locations (ELA 2023).	Flagging of trail alignment, during construction.
2	All machinery to be used during the construction phase should be limited to the existing disturbed areas and access tracks and the proposed trail alignment as far as is possible (ELA 2023).	During construction
3	The proposed trail should be constructed and implemented in accordance with best practice design standards to ensure that there are no adverse modifications to the hydrological environment that may impact on surrounding vegetation and associated habitats (ELA 2023).	During construction
4	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 (ELA 2023).	Prior to construction
5	Prior to the commencement of construction works, all relevant weed species identified within the construction corridor are to be treated in accordance with best practice methods to ensure these weeks are not spread further within the site or throughout KNP.	Prior to construction
6	All equipment, machinery and vehicles used during construction of the Development must be cleaned prior to entry into KNP and prior to Subject site mobilisation to ensure they are free of mud and vegetative propagules.	Prior to and during construction
7	Equipment, machinery, and vehicles must be regularly maintained and manoeuvred to prevent the spread of exotic vegetation. Storage of equipment, machinery, vehicles and material is to be restricted to existing disturbed areas and not be stored on native vegetation.	During construction
8	Disposal and storage of putrescible wastes must be undertaken appropriately to ensure feral animals aren't attracted to the site.	During construction
Transport		
1	Traffic and construction vehicle access will be managed as per regular daily operation in the resort.	During construction
2	Appropriate signage will be installed to ensure the safety of road users, cyclists and pedestrians during construction and operation.	Prior to and during construction, operation
Air Quality, Noise and Vibration		
1	Reasonable and practicable measures (e.g. water sprays, vehicles carrying rubble must be covered) will be implemented to prevent dirt and dust from affecting the amenity or the surrounding environment during construction. Measures will be detailed in the SEMP.	During construction
2	In the event a complaint is received in relation to air quality, dust or noise nuisance, the source of the complaint will be investigated, and if required corrective actions will be implemented to minimise or avoid impacts.	During construction
3	Project staff will take reasonable and practicable management measures to avoid and mitigate environmental nuisance from noise associated with the works e.g. turn off plant that is not being used.	During construction
4	Construction works and operation of plant will comply with Australian Standard *AS 2436-2010 Guide to noise and vibration control on construction, demolition and maintenance sites* and the *Interim Construction Noise Guideline* (DECC 2009) e.g. ensure plant is regularly	During construction

	maintained, and repair or replace equipment that becomes noisy, keep drivers informed of designated vehicle routes and parking locations	
Cultural Heritage		
1	Where unexpected items of potential archaeological, built or Aboriginal cultural heritage significance are discovered, works will cease, relevant authorities (NPWS) will be notified, and the site will be secured by erecting a no-go zone. If human remains are found, works will cease, the site will be secured, and NSW Police will be notified immediately.	During construction
Waste		
1	Waste to be managed in accordance with the waste hierarchy – avoid and reduce → reuse waste→ recycle waste → recover energy→ treat waste→ dispose of waste. All waste to be managed and disposed of in accordance with legislative requirements and relevant standards.	During construction

8 Conclusion

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

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 Project site and surrounds.

The Development has been sited to avoid constrained areas such as higher conservation significance vegetation communities and land mapped on the BV Map As such, the Development will not trigger the BOS, as it will not affect any land identified on the BV map and the total clearing of native vegetation associated with the proposal will not exceed the 1 ha threshold which applies to the Thredbo Resort area. The assessment of the effects of the Development on threatened species, populations and ecological communities which may be directly or indirectly affected by the Development concluded that the Development is unlikely to have a significant effect on threatened species, populations or ecological communities or their habitats (ELA 2023).

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.

The Development will not cause any significant adverse impacts to the surrounding landscape characteristics or visual amenity. The Development will have positive impacts on the existing social and economic environment through the provision of a sustainable trail section which can be experienced by a range of mountain bikers of varying ability.

The impacts of the Development are considered to be largely positive. With the implementation of appropriate mitigation and management measures during construction and operation, the environmental impacts are considered acceptable. Therefore, the Development is considered suitable for the site and within the public interest.

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10 Acronyms and Abbreviations

Acronyms and Abbreviations	
AHD	Australian Height Datum
AHIP	Aboriginal heritage impact permit
BC Act	*Biodiversity Conservation Act 2016*
BCA	Building Code of Australia
BVP	Biodiversity Values Map
BC Regulation	Biodiversity Conservation Regulation 2017
DA	Development Application
DAWE	Department of Agriculture, Water and the Environment (now DCCEEW)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (formerly DAWE)
DPE	NSW Department of Planning and Environment
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2021*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
IMBA MTB Guidelines	*Guidelines for a Quality Trail Experience: Mountain Bike Trail Guidelines* (IMBA 2018)
KNP	Kosciuszko National Park
KNP Cycling Strategy	Kosciuszko National Park Cycling Strategy 2017
KNP POM	Kosciusko National Park Plan of Management 2006
km	kilometres
OEH	Office of Environment and Heritage (NSW)
m	metres
m^2	square metres
mm	millimetres
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
NSW	New South Wales
Precincts – Regional SEPP	*State Environmental Planning Policy (Precincts—Regional) 2021*
Soil Stockpile Guidelines	*Soil Stockpile Guidelines for the Resort Areas of Kosciuszko National Park, version 1.0* (OEH 2017)
SEE	Statement of Environmental Effects
Thredbo	Thredbo Alpine Resort

11 Appendices

Appendix A IMBA Trail Difficulty Rating System

8.0 Trail Difficulty Rating System Land Managers Guide

	Very easy White Circle	Easy Green Circle	Intermediate Blue Square	Difficult Single Black Diamond	Extreme Double Black Diamond
Description	Likely to be a fire road or wide single track with a gentle gradient, smooth surface and free of obstacles. Frequent encounters are likely with other cyclists, walkers, runners and horse riders.	Likely to be a combination of fire road or wide single track with a gentle gradient, smooth surface and relatively free of obstacles. Short sections may exceed these criteria. Frequent encounters are likely with other cyclists, walkers, runners and horse riders.	Likely to be a single trail with moderate gradients, variable surface and obstacles. Dual use or preferred use Optional lines desirable	Likely to be a challenging single trail with steep gradients, variable surface and many obstacles. Single use and direction Optional lines XC, DH or trials	Extremely difficult trails will incorporate very steep gradients, highly variable surface and unavoidable, severe obstacles. Single use and direction Optional lines XC, DH or trials
Trail Width	2100mm plus or minus 900mm	900mm plus or minus 300mm for tread or bridges.	600mm plus or minus 300mm for tread or bridges.	300mm plus or minus 150mm for tread and bridges. Structures can vary.	150mm plus or minus 100mm for tread or bridges. Structures can vary.
Trail Surface	Hardened or smooth.	Mostly firm and stable.	Possible sections of rocky or loose tread.	Variable and challenging.	Widely variable and unpredictable.
Average Trail Grade	Climbs and descents are mostly shallow. Less than 5% average.	Climbs and descents are mostly shallow, but may include some moderately steep sections. 7% or less average.	Mostly moderate gradients but may include steep sections. 10% or less average.	Contains steeper descents or climbs. 20% or less average.	Expect prolonged steep, loose and rocky descents or climbs. 20% or greater average
Maximum Trail Grade	Max 10%	Max 15%	Max 20% or greater	Max 20% or greater	Max 40% or greater
Level of Trail Exposure	Firm and level fall zone to either side of trail corridor	Exposure to either side of trail corridor includes downward slopes of up to 10%	Exposure to either side of trail corridor includes downward slopes of up to 20%	Exposure to either side of trail corridor includes steep downward slopes or freefall	Exposure to either side of trail corridor includes steep downward slopes or freefall

Natural Obstacles and Technical Trail Features (TTFs)	No obstacles.	Unavoidable obstacles to 50mm (2") high, such as logs, roots and rocks. Avoidable, rollable obstacles may be present. Unavoidable bridges 900mm wide. Short sections may exceed criteria.	Unavoidable, rollable obstacles to 200mm (8") high, such as logs, roots and rocks. Avoidable obstacles to 600mm may be present. Unavoidable bridges 600mm wide. Width of deck is half the height. Short sections may exceed criteria.	Unavoidable obstacles to 380mm (15") high, such as logs, roots, rocks, drop-offs or constructed obstacles. Avoidable obstacles to 1200mm may be present. Unavoidable bridges 600mm wide. Width of deck is half the height. Short sections may exceed criteria.	Large, committing and unavoidable obstacles to 380mm (15") high. Avoidable obstacles to1200mm may be present. Unavoidable bridges 600mm or narrower. Width of bridges is unpredictable. Short sections may exceed criteria.

Source: Section 8.0 Trail Difficulty Rating System Land Managers Guide of (IMBA 2012, p.10).

Appendix B Trail Design and Construction Techniques

Trail Design Elements and Construction Techniques	
Berm	
Decision point sign	
Partial and full bench	 **Hillside before trail:** Vegetation keeps water sheeting slowly downhill **Incomplete Full Bench:** Left with unfinished vertical cut, soil will slough off, making tread narrower. Obtrusive back cut also forces rider to outside of tread. **Full Bench Cut:** Entire tread width is cut into firm mineral soil. Tread compacts uniformly and is sustainable. 5% outslope ensures water sheets across tread. Back cut is blended into back slope. Proper back slope, out slope and full bench cut minimize maintenance.

	Source: IMBA 2001
Outslope	
Rock armour	
Natural feature	

Half rule		
Grade reversals		
Drainage		

Appendix C Standard Signage Plans

Decision Point Sign

200 mm

400 mm

Date: 14/06/2022 Revision: 0 Kosciuszko Thredbo Pty Ltd **Not to scale**	**Standard Signage Plans** **Project: Lower All Mountain MTB Trail Diversion**	THREDBO

Appendix D Desktop Search Results

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: 22-Nov-2023

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:	42
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 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
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
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

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Stagonopleura guttata](#) Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
CRUSTACEAN			
[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
MAMMAL			
[Burramys parvus](#) Mountain Pygmy-possum [267]	Endangered	Species or species habitat known to occur within area	In feature area
[Dasyurus maculatus maculatus (SE mainland population)](#) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	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 buffer area only
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

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 buffer area only
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 buffer area only
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat may 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
[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			
[Actitis hypoleucos](#)			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
[Calidris acuminata](#)			
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#)			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat 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
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.

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Playground

Client Service ID : 842278

Kosciuszko Thredbo Pty Ltd

Date: 22 November 2023

Po Box 92
Thredbo New South Wales 2625

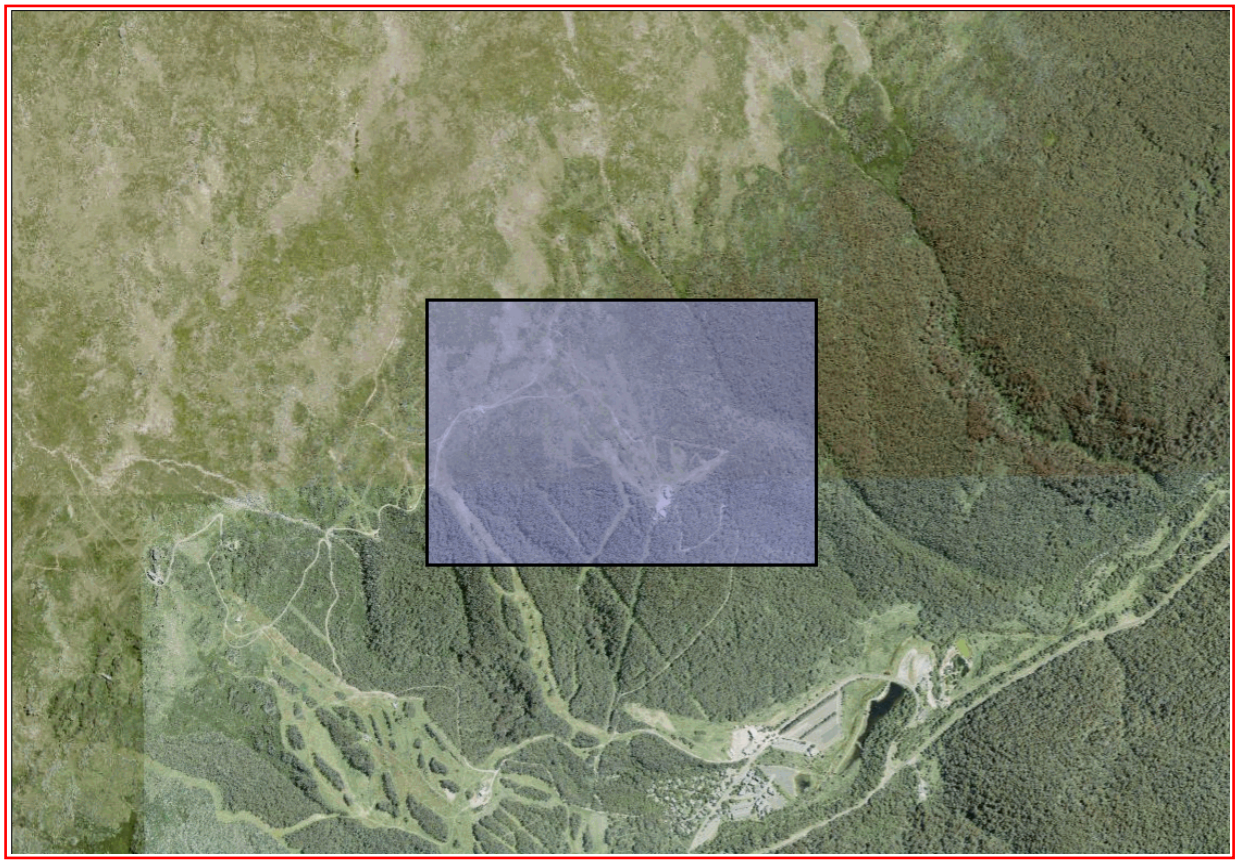
Attention: Chloe Chalk

Email: chloe_chalk@evt.com

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -36.4934, 148.2983 - Lat, Long To : -36.4848, 148.3137, conducted by Chloe Chalk on 22 November 2023.

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

Appendix E Flora and Fauna Assessment

Flora and Fauna Assessment - Playground MTB Trail Thredbo Alpine Resort

Kosciuszko Thredbo Pty Ltd

ecological AUSTRALIA
A TETRA TECH COMPANY

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DOCUMENT TRACKING

Project Name	Flora and Fauna Assessment - Playground MTB Trail Thredbo Alpine Resort
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Project Manager	Ryan Smithers
Prepared by	Ryan Smithers
Reviewed by	David Coombes
Approved by	Ryan Smithers
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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	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
KT	Kosciuszko Thredbo Pty Ltd
LGA	Local Government Area
NSW	New South Wales
NOW	NSW Office of Water
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSI	State Significant Infrastructure
TEC	Threatened Ecological Community
VIS	Vegetation Information System
WM Act	*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 the Playground mountain bike trail at Thredbo Alpine Resort.

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

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

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

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

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

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

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

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

1. Introduction

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

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

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

1.1 The proposal

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

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

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

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

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

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

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

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

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

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

1.2 Direct and indirect impacts

Direct impacts on flora and fauna arising from the proposal will predominantly comprise the removal or further disturbance to approximately 925 m^2 of native vegetation (entirely shrubland derived from the clearing of Subalpine Woodland). The required vegetation removal will be limited to the removal of understorey and groundcover vegetation and associated habitats.

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

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

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

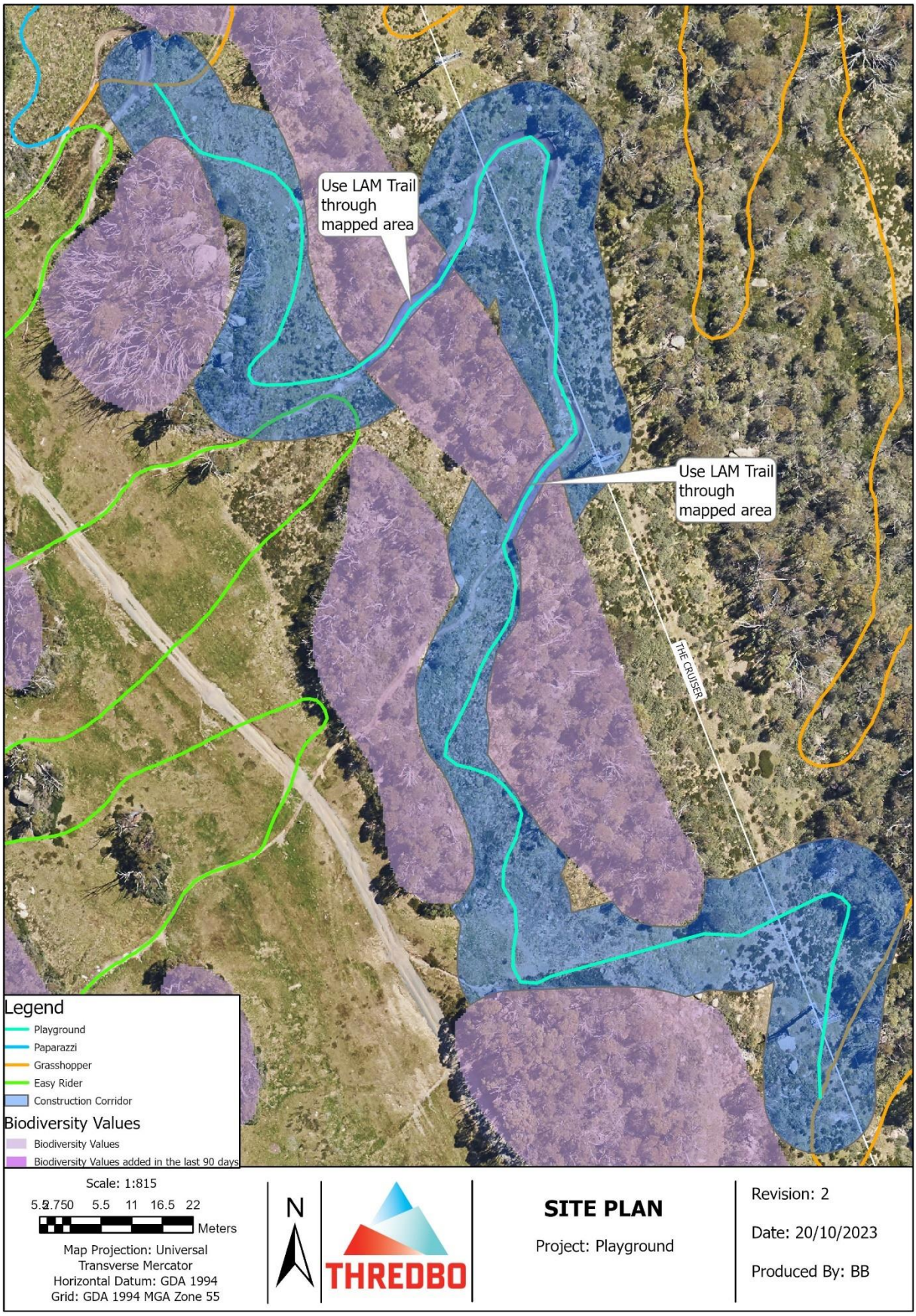

Figure 1: The proposal

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

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

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

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

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

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

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

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

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

1.3 Subject site, study area and locality

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

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

1.4 Topography, geology and soils

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

1.5 Disturbances

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

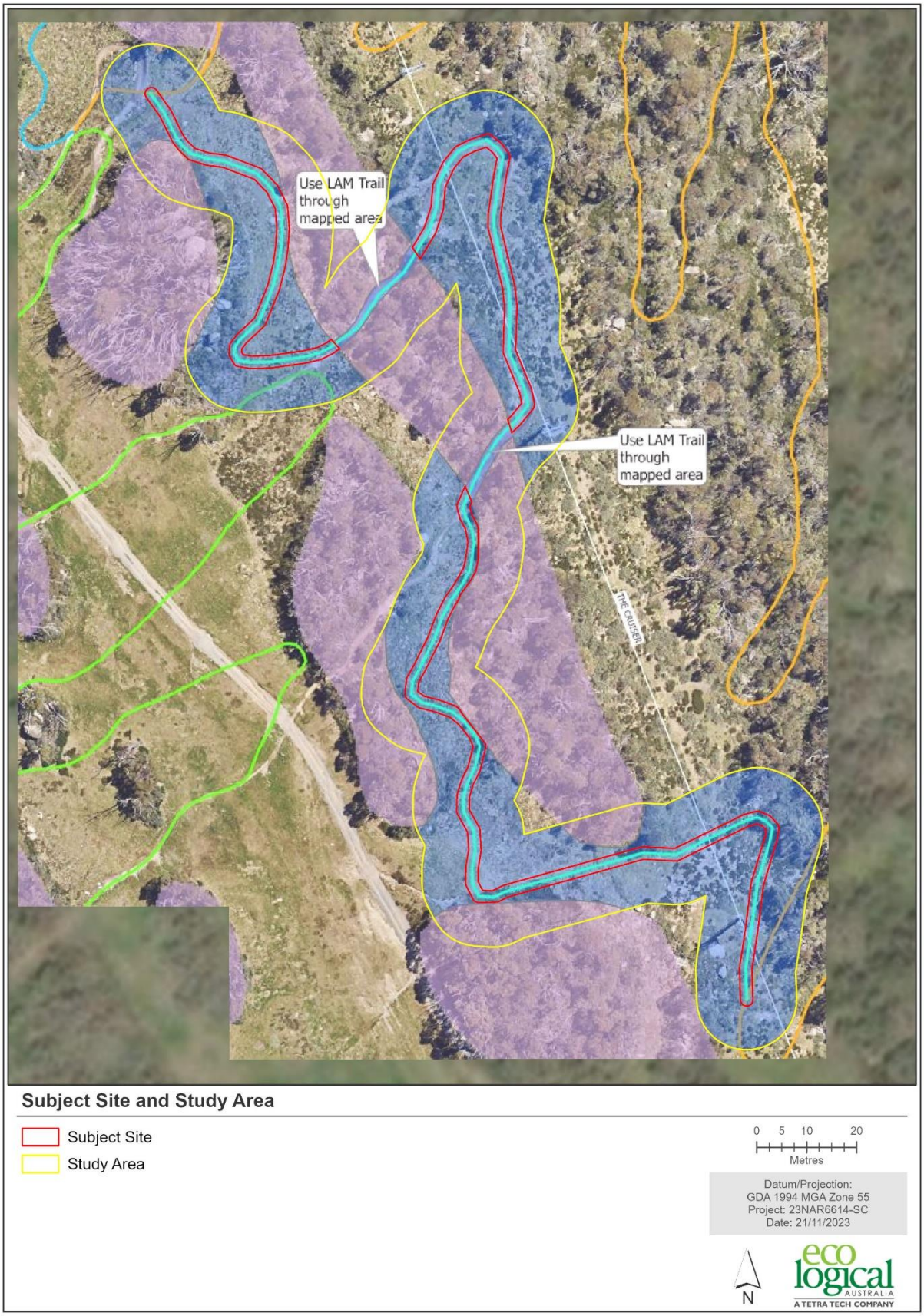

Figure 2: The subject site and study area.

1.6 Planning and legislation

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

1.6.1 Environmental Planning and Assessment Act 1979

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

1.6.2 Biodiversity Conservation Act 2016

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

1.6.3 State Environmental Planning Policy (Precincts—Regional) 2021

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

1.6.4 Environment Protection and Biodiversity Conservation Act 1999

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

1.6.5 State Environmental Planning Policy (Koala Habitat Protection) 2021

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

2. Methods

2.1 Database and literature review

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

2.2 Field surveys

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

2.2.1 Flora surveys

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

2.2.1.1 Community identification and floristic audit

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

2.2.1.2 Targeted searches

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

2.2.1.3 Limitations

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

2.2.1.4 Flora survey effort

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

2.2.2 Fauna surveys

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

2.2.2.1 Habitat analysis

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

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

2.2.2.2 Diurnal surveys

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

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

2.2.2.3 Limitations

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

2.2.2.4 Survey effort

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

3. Results

3.1 Database and literature review

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

3.2 Flora

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

3.2.1 Subalpine Woodland

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

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

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

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

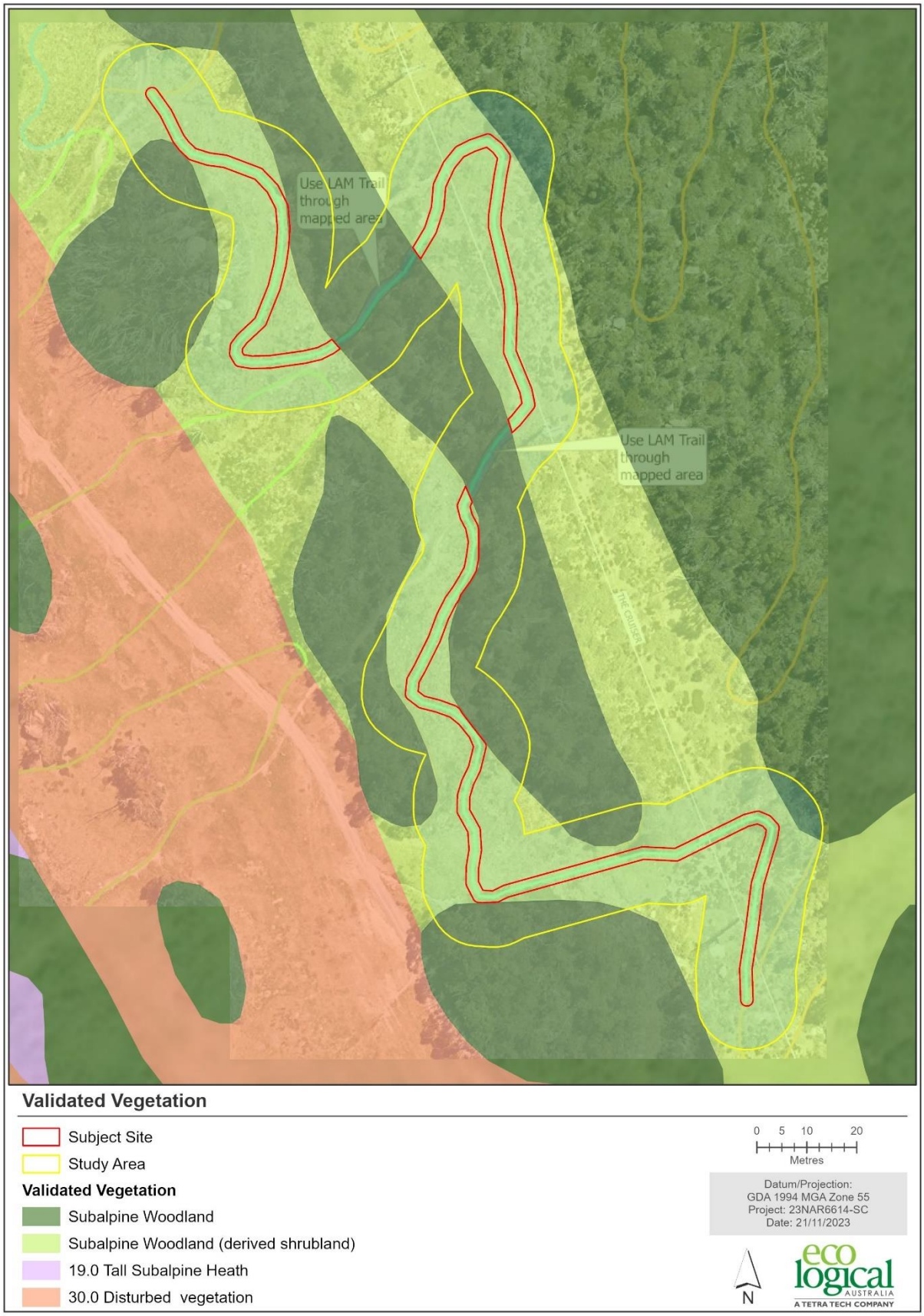

Figure 3: Vegetation within and surrounding the study area after the classifications of Ecology Australia (2002)

3.3 Fauna

3.3.1 Fauna habitats

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

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

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

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

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

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

4. Impact assessment

4.1 Impacts on vegetation communities

4.1.1 Subalpine Woodland

The proposal will result in the removal of approximately 925 m^2 of the shrubland derived from the historic clearing of Subalpine Woodland. The impacts will primarily be on understorey shrubs and groundcovers with a few eucalypt saplings also likely to be affected.

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

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

4.2 Impacts on threatened ecological communities

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

4.3 Impacts on fauna habitats

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

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

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

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

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

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

4.4 Threatened species likelihood of occurrence

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

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

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

V = Vulnerable

4.5 Conclusion of Test of Significance

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

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

4.6 Conclusion of EPBC assessment

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

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

5. Recommendations

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

Vegetation and habitat management

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

Sediment control

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

Rehabilitation

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

6. Conclusion

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

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

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

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

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

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

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Appendix A : Likelihood of occurrence

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

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

The terms for likelihood of occurrence are defined below:

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

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
FLORA						
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
Carex archeri	Archer's Carex	-	E	-	This species is associated with alpine herbfield, sod tussock grassland or alpine heathland and is known in NSW only from the Club Lake and upper Thredbo River areas. There is no suitable habitat for the species within the study area.	No
Carex raleighii	Raleigh Sedge	-	E	-	This species is associated with alpine herbfield, sod tussock grassland or alpine heathland. There is no suitable habitat for the species within the study area.	No
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 zone below 1800 m altitude. There is no habitat for the species within the study area.	No
Glycine latrobeana	Clover Glycine	-	CE	V	Clover Glycine is found across south-eastern Australia in native grasslands, dry sclerophyll forests, woodlands and low open woodlands with a grassy ground layer. There is no suitable habitat for the species within the study area.	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
Haloragis exalata subsp. *exalata*	Square Raspwort	-	-	V	The Square Raspwort appears to be a post-disturbance coloniser, based on observations of large numbers of plants on disturbed roadsides, cleared power-line easements, and recently burnt or flooded areas. The nearest populations are in the Geehi Valley. There is no suitable habitat for the species within the study area.	No
Leucochrysum albicans subsp. *tricolor*	Hoary Sunray	-	-	E	In NSW the Hoary Sunray occurs at relatively high elevations in woodland and open forest communities, in an area roughly bounded by Goulburn, Albury and Bega. The species has been recorded in the Yass Valley, Tumut, Upper Lachlan, Snowy River and Galong. The species is known from the South Eastern Highlands, Australian Alps and Sydney Basin bioregions. Herbarium records indicate that the taxa once occurred more widely in inland NSW, near Cobar, Dubbo, Lithgow, Moss Vale and Delegate.	No
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 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). There is no suitable habitat within study area.	Unlikely

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
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. There is no suitable habitat within study area.	No
Ranunculus anemoneus	Anemone Buttercup	-	V	V	This perennial forb of the alpine and upper alpine zones tends to occur in areas where snow persists late into the warm season. The species is relatively common in the higher subalpine and alpine areas in the locality. This species was not observed within the study area despite good survey coverage.	No
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
Thesium australe	Austral Toadflax	-	V	V	This species is semi-parasitic on roots of a range of grass species, mainly Kangaroo Grass.	No
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 only a very small are of marginal potential habitat for the species within the study area and it is considered unlikely that it would occur there. The specie hasn't been recorded within 10 km of the study area.	Unlikely

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

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

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

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
FISH						
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	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	V	Currently, the Australian Grayling occurs in streams and rivers on the eastern and southern flanks of the Great Dividing Range, from Sydney, southwards to the Otway Ranges of Victoria and in Tasmania. The species is found in fresh and brackish waters of coastal lagoons, from Shoalhaven River in NSW to Ewan Ponds in South Australia. It is absent from the inland Murray-Darling system (DPI 2006; McDowall 1980b). There is no suitable habitat within the study area.	No
MAMMALS						
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	Potential

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

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					occurs in ferny gullies. It is considered highly unlikely that the species would occur within the study area or immediate surrounds give its rarity and the nature of the habitats there.	
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. 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 include potential habitat for this species and it is possible that it would occur there.	Potential
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 humus soils beneath boulders and shrubs. The species has not been recorded in close proximity to the study area despite targeted surveys and it is considered unlikely that it would occur there.	Unlikely
BIRDS						
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	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					abundant nectar sources with different flowering times to provide a reliable supply of nectar. The species would not occur within the study area.	
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-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.	Unlikely
Botaurus poiciloptilus	Australasian Bittern		V	E	This species favours permanent freshwater wetlands with tall, dense vegetation, particularly bulrushes and spikerushes. It hides during the day amongst dense reeds and feeds at night. It breeds during summer with nest built in secluded places in densely vegetated wetlands on a platform of reeds. There is no habitat for the species within the study area.	No
Callocephalon fimbriatum	Gang-gang Cockatoo		V	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.	Yes
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
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	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW. The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW.	
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		E	CE	Breeds in Tasmania between September and January. Migrates to mainland in autumn, where it forages on profuse flowering Eucalypts. Hence, in this region, autumn and winter flowering eucalypts are important for this species. Favoured feed trees include winter flowering species such as Swamp Mahogany (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
Neophema chrysogaster	Orange-bellied Parrot		E	CE, M	Breeds only in coastal south-west Tasmania and spends the winter in coastal Victoria and South Australia. It nests in hollows in eucalypt trees which grow adjacent to its feeding plains. In early October the birds arrive in the south west and depart after the breeding season usually in March and April. It feeds on the seeds of several sedges and heath plants, including buttongrass. Its main food preferences are found in sedgelands which have not been burned for between 3-15 years. Also included in the diet are seeds of three Boronia species and the everlasting daisy (Helichrysum pumilum). After breeding,	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					migrating birds move gradually northwards up the west coast, through the Hunter Group and King Island in Bass Strait and on to the mainland. On the journey the birds usually feed on beach-front vegetation including salt tolerant species such as sea rocket (Cakile maritima). They also eat various coastal native and introduced grasses. There is no habitat for the species within the study area.	
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 Montane Forests rather than subalpine woodlands with a heathy understorey.	Unlikely
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. There is no suitable habitat for the species within the study area and it is considered unlikely that it would occur there.	Unlikely
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	Known

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
					would likely use the more open habitats within the study area from time to time for foraging.	
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
MIGRATORY TERRESTRIAL AND WETLAND SPECIES LISTED UNDER EPBC ACT						
Hirundapus caudacutus	White-throated Needletail		—	M	Forages aerially over a variety of habitats usually over coastal and mountain areas, most likely with a preference for wooded areas. Has been observed roosting in dense foliage of canopy trees, and may seek refuge in tree hollows in inclement weather.	Unlikely
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
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		E	E, M	SEE DIURNAL BIRDS ABOVE	No

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
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		E	E, M	SEE DIURNAL BIRDS ABOVE	No
Gallinago hardwickii	Latham's Snipe		E	M	Resides in swamps, dams and nearby marshy areas that contain grasses, lignum, low scrub or open timber that provides cover. It is considered highly unlikely that the species would occur within the study area.	Unlikely
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 DEW protected matters report) have not been included in this table, since they are considered unlikely to occur within the study area due to the absence of marine and wetland habitats.						

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

Appendix B : Test of significance

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Flame Robin *Petroica phoenicea* (known occurrence)

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

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

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

Olive Whistler *Pachycephala olivacea* (potential occurrence)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix C: EPBC Act Significant Impact Criteria

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

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

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

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

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

Matters to be addressed	Impact
(a) any environmental impact on a World Heritage Property or National Heritage Places;	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 Alpine She-oak Skink. 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 not remove any foraging habitat for the species. The proposal will not affect any breeding or roosting habitat or otherwise adversely impact the species.

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

Matters to be addressed	Impact
	It is considered highly unlikely that the Gang-gang Cockatoo would breed within the study area given the absence of hollow-bearing trees. Under these circumstances, the proposed action will not disrupt the breeding cycle of a population of the Gang-gang Cockatoo. Given the absence of records of the Alpine She-oak Skink within the study area it is unlikely, although possible that they may breed within the study area, however any local populations of the species would not be limited to the study area, which represents a negligible proportion of the potential habitat available to the species in the locality. The study area is also contiguous with large areas of similar, and less disturbed habitats. Under these circumstances, it is highly unlikely that the proposal would disrupt the breeding cycle of a population of the Alpine She-oak Skink. 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, but this area is unlikely to be important to the 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 is likely to decline. The proposal will remove or modify a relatively small area of potential habitat for the Alpine She-oak Skink, which is unlikely to be important to the species in the context of the extent of potential habitat for these species in the locality. There are no records of the species within the study area or immediate surrounds and the potential habitat within the study area. Under these circumstances, it is highly unlikely that the proposal would modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the Alpine She-oak Skink is likely to decline. 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 Alpine She-oak Skink. Species such as cats or foxes are already present in the landscape and are subject to control programs within the resort. 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 Alpine She-oak Skink 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 and Alpine She-oak Skink are 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 Broad-toothed Rat. 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*.

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

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

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Appendix F Site Environmental Management Plan

Site Environmental Management Plan

Playground Mountain Bike Trail

Thredbo Alpine Resort
Kosciuszko National Park, NSW

January 2024

Document Control

Revision	Date	Revision Type	Author	Approved by
A	23/11/23	Draft	C.Chalk	K.Delpit
0	9/1/24	Final	C.Chalk	K.Delpit

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Contents

Figures

Tables

1 Introduction

This Site Environmental Management Plan (SEMP) has been prepared for implementation by Kosciuszko Thredbo Pty Ltd (KT) (and its contractors) for the Playground Mountain Bike Trail (the Project).

This SEMP outlines how construction activities for the Project are to be managed in order to maintain and protect the environmental values of the Project site and surrounds.

The objectives of this SEMP are to:

- Provide mitigation measures to minimise the potential for environmental harm and/or environmental nuisance.
- Provide guidance for the development of detailed construction environmental management plans.
- Ensure all Project Personnel understand individual roles and responsibilities.
- Provide corrective actions to be implemented in the event of environmental harm and/or environmental nuisance. and
- Ensure Project personnel understand incident and emergency response procedures.

2 Reference Documentation

2.1 Legislation

The Project will be carried out in accordance with the applicable legislative requirements outlined in the following Acts and subordinate legislation:

- *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*;
- *Biodiversity Conservation Act 2016*;
- *Environmental Planning and Assessment Act 1979*;
- *Environmentally Hazardous Chemicals Act 1985*;
- *Heritage Act 1977*;
- *National Parks and Wildlife Act 1974*;
- *Protection of the Environment Operations Act 1997*;
- *Waste Avoidance and Resource Recovery Act 2001;*
- *Water Management Act 2000;* and
- *Work Health and Safety Act 2011.*

2.2 Guidelines

- Guideline for the Preparation of Environmental Management Plans (DIPNR 2004)
- Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition (Landcom 2004)
- Managing Urban Stormwater: Soils and Construction, Volume 2A, Installation of services (NSW DECC 2008)
- Interim Construction Noise Guidelines (DECC 2009)
- NSW EPA Waste Classification Guidelines (NSW EPA 2014)

2.3 Procedures & Policies

The following Kosciuszko Thredbo procedures and guidelines apply to the Project:

- Construction Site Incident and Emergency Procedures Thredbo Village, version 1.1 (KT045)
- Emergency Response Spill Procedure, version 1 (KT074)
- Standard Operating Procedure: Use and Maintenance of Wash Down Bay (KT055), 2019
- Bushfire Danger Period Policy (KT021), version 2

3 Project Description

3.1 Project Location

The Project site is located within Thredbo Alpine Resort (Thredbo), Kosciuszko National Park (KNP), approximately 35 kilometres (km) south-west of Jindabyne, New South Wales (NSW).

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

3.2 Scope of Works

The Project will comprise:

- vegetation clearing;
- construction of mountain bike trail, including earthworks; and
- rehabilitation works.

4 Construction Management Details

4.1 Construction Period

Construction of the Development is anticipated to commence early 2024 during the general resort "construction summer period" (generally the period commencing after the October long weekend and ending no later than 30 April the follow year).

4.2 Work Hours

Works will be carried out in accordance with the hours specified in the Development Consent.

4.3 Site Access

During construction, the site access will be via the Mountain access road and secondary access tracks.

4.4 Vehicles, Machinery and Equipment

Machinery, plant and equipment will likely include (but not limited to):

- mini excavator;
- motorised wheelbarrows;
- quad bikes;
- dump trucks (to and from stockpile sites);
- 4 WD vehicles;
- side-by-side vehicles; and

- handtools (i.e. chainsaws and brush-cutters).

The tread width of on-ground machinery used in trail construction must not exceed 1,500 millimetres (mm).

4.5 Flexible Construction Corridor

The construction corridor for the Development comprises 10 m either side of the ground-truthed alignment, except for the sections of trail that utilise the existing LAM alignment trail corridor in the BV mapped areas. The flexible 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.

4.6 Trail Corridor

The width of the MTB trail corridor must not exceed 3 m at any location, with an average disturbance width not exceeding 2.5 m. The estimated disturbance of the trail corridor is approximately 1,030 m^2 (2.5 m wide x 412 m long). Refer to **Appendix A** for the site plan showing the construction corridor.

4.7 Construction Activities

Pre-construction activities will comprise:

- Establishment of site boundary;
- Marking significant vegetation to be retained and no-go zones;
- Erection of site signage and traffic controls;
- Flagging exact trail alignment using pin flags to mark the edges of the trail for construction; and
- Mobilisation of machinery, equipment and construction materials to site.

Construction activities will comprise:

- Vegetation clearing (50 m increments) within the trail corridor to expose bare earth;
    - excess cut vegetation to be spread into the surrounding heath and used for rehabilitation of exposed soil on the trail edges;
    - topsoil and vegetation sods are to be stockpiled close to the trail tread;
- Cut into the slope using a mini excavator and excavate the soil to achieve the appropriate depth of bench;
- Remove loose rocks, roots and compact the trail;
- Back slope the batter, ensuring outslope and appropriate drainage;
- Define the trail line using rocks, logs and other obstacles; and
- Re-instate the verge areas, topsoil and preserved vegetation sods.

Post-construction activities will comprise:

- Rehabilitation in accordance with the Rehabilitation and Monitoring Plan;
- Demobilisation of plant and machinery; and
- Site clean-up.

4.8 Adverse Weather Contingencies

Adverse weather events (e.g. high winds, thunderstorms, heavy rain, hail, snow, bushfire and high temperatures) have the potential to negatively impact upon construction activities. To ensure appropriate consideration of such events, the Project and Construction Manager will monitor weather conditions throughout the construction period. The Bureau of Meteorology (BoM) Thredbo AWS station provides daily weather observation data for the resort. The NSW Rural Fire Service website 'Fires Near Me' includes information on current bush fires and other incidents, as well as warnings for fires which may affect your location.

If adverse weather events are anticipated and/or occur during construction, contingencies will be implemented and arrangements will be made to postpone construction activities.

The Construction Manager / Site Project Manager will be responsible for notifying construction staff of any impending adverse weather, and to implement appropriate controls onsite, such as:

- Erecting wind breaks or covering stockpiles to prevent materials being blown away.
- Evaluate temporary sediment and erosion controls to ensure they are adequately installed to withstand adverse weather events.
- Discontinue use of plant and machinery.
- Secure materials and equipment.
- Protect open excavations.

4.9 Stockpiles and Material Storage Areas

4.9.1 Site Compound

No site compound is required for the Project.

4.9.2 Stockpile Sites

Temporary stockpiles will be required along the trail alignment for the effective management of gravel, soil and vegetation. These stockpiles will be located within pre-disturbed areas, on relatively flat land, away from watercourses and avoid native vegetation. Excess materials from construction will be located within the main stockpile area within the resort. Access to these locations will be restricted to KT staff and contractors. Soil stockpiles will be managed in accordance with the *Soil Stockpile Guidelines for the Resort Areas of Kosciuszko National Park, version 1.0* (OEH 2017) (Soil Stockpile Guidelines). The main stockpile sites are identified in **Appendix B**. All stockpiles will be managed in accordance with the environmental controls in **Section 6** and the Erosion and Sediment Control Plan (**Appendix C**).

4.9.3 Site Facilities and Temporary Structures

There will be no site facilities or temporary structures within the construction corridor.

4.9.4 Material Storage Areas

No material storage areas are required within the construction corridor.

4.9.5 Construction Materials

Construction materials will likely include:

- Trail signs; and
- Gravel / decomposed granite for the trail surface.

4.9.6 Waste

Waste generated from the Development is expected to be minor. General litter bins, recyclable bins and KT's waste transfer facility will be used for the storage and disposal of construction waste. Excess spoil will be transported to the dedicated stockpiles sites, as shown in **Appendix B.**

4.9.7 Imported materials and stabilising agents

NPWS requests that its authorisation is sought where the proponent intends to utilise either of the following in construction or maintenance of the trail:

- Imported gravel or fill material; or
- soil stabilising or adhesive agents.

The proponent may obtain imported gravel or fill material from sources already assessed by NPWS as appropriate for use in KNP, being gravel or fill material from:

- the McMahons Earthmoving quarry, located on Alpine Way, Crackenback NSW; or
- the Kraft Earthmoving / Snowy Mountains Sand and Gravel quarry located on Kosciuszko Road, Jindabyne NSW.

5 Environmental Management

5.1 Roles and Responsibilities

The Project team structure is provided in **Figure 1**.

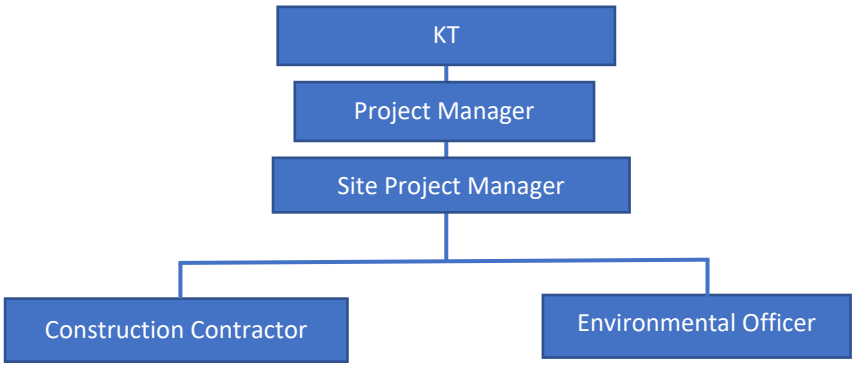


Figure 1: Project Team Structure

The roles and responsibilities are outlined in **Table 1**.

Table 1: Roles and Responsibilities

Role	Responsibilities
Project Manager	• Ensure the SEMP is made available, communicated, maintained and understood by all Project staff. • Responsible for the overall management of the construction and operation of the Project. • Ensure the SEMP is updated with applicable conditions of approval following the provision of Development Consent from Department of Planning and Environment (DPE).

	• Ensure that the requirements of the SEMP and sub-plans have been addressed in all contractor environmental management documentation. • Review of incidents, non-conformances and non-compliance. • Ensuring Project personnel and contractors are adequately trained and qualified to fulfil their roles.
Site Project Manager	• Implement and maintain the SEMP. • Ensure all Project personnel comply with the requirements of the SEMP. • Report any incidents, non-conformances to the Project Manager.
Environmental Officer	• Oversee all works which are part of the Project on behalf of KT. • Ensure compliance with all environmental protection measures detailed in the SEMP, supporting management plans and conditions of approval. • Ensure all environmental controls are in place and adequately functioning during construction. and • Conduct construction inspections and complete reporting requirements e.g. progress reports, environmental incidents, non-compliance, corrective action and auditing.
All Personnel	• Comply with requirements of this SEMP. • Report any actual or potential environmental incidents to the Construction Manager immediately. • Identify and report non-conforming or potentially hazardous work practices, equipment, machinery or products. • Only perform tasks for which they are trained and competent. • Assist with environmental incident investigations and applying corrective actions. • Ensure all machinery, plant and equipment are in good working order and condition prior to use.
Construction Contractor	• Comply with SEMP and legislative requirements. • Construction contractor to develop and implement management plans in accordance with this SEMP, conditions of approval and contractual obligations.

5.2 Communication and Consultation

5.2.1 Training and Awareness

All Project staff will be made aware of the site-specific environmental controls through a site induction, and pre-start meetings / toolbox talks prior to the commencement of construction.

The site induction will cover the following key aspects:

- Roles and responsibilities.
- Overview of environmental risks and specific locations of environmental and/or cultural heritage significance.
- The scope of legislative requirements and other licences and approvals.
- Communication and notification requirements e.g. procedures for notifying and reporting incidents and complaints.
- Environmental management and controls stipulated in this SEMP.
- Workplace health and safety issues.
- Emergency preparedness and response.
- Procedures for notifying and reporting incidents and complaints.

5.2.2 Key Contacts

Key contacts for the Project are provided in **Table 2**. Prior to commencement of works, contact details (name and contact number) will be provided for Project personnel.

Table 2: Key Project Personnel Contact Details

Company / Agency	Role / Reason	Name	Contact
Government Agency Contacts			
Department of Planning and Environment (DPE) (Alpine Resorts Team)	Development approval and compliance	-	(02) 6456 1733
National Parks and Wildlife Service (NPWS)	Flora, fauna, archaeology	-	(02) 6450 5600
Environment Protection Agency (EPA)	Water, noise, air pollution and regulation	-	131 555
NSW Soil Conservation Service	Soil erosion and sediment control	-	02 9842 8300
Thredbo Village Services			
Thredbo Medical Centre	General medical attention	-	(02) 6457 6254
Fire and Rescue Thredbo, NSW	Incident / emergency	-	(02) 6457 6144
Emergency Contacts			
NSW Police	In case of fire, medical or police emergency	-	000
NSW Fire and Rescue		-	
NSW Ambulance		-	

5.2.3 Consultation

KT is committed to ensuring effective communication and consultation is undertaken to inform the development of this SEMP and ensure it is implemented on-site as per the Project roles and responsibilities in **Section 5.1.** Where required, communication with key external stakeholders such as DPE and NPWS will be undertaken. A summary of the key consultation activities is provided in **Table 3**.

Table 3: Summary of Consultation Activities

Consultation Activity	Communication Method	Frequency
Internal	Site inductions	Prior to commencement of works
	Pre-start meetings and toolbox talks	Daily
	Reports to Project Manager identifying project progress, any environmental incidents, and review of any complaints or enquiries	Weekly
External	Face-to-face meetings, phone and email correspondence with relevant Government Departments / Agencies	As required
	In-writing notifications to Government Departments / Agencies and relevant parties	As required

5.2.4 Notification Protocols

A summary of the key notification protocols is provided in **Table 4.** Notification requirements will be updated as required.

Table 4: Regulatory Agency Notification Protocols

Party to Notify	What to Notify	When to Notify	Responsibility to Notify Regulatory Agency
DPE	Commencement of construction	DPE will be notified in writing at least 48 hours prior to the commencement of construction.	Site Project Manager
NPWS	Details of any material suspected of being a European or Aboriginal culturally significant site, relic or artefact.	Immediately upon discovery of any archaeological/culturally significant site or relic that are encountered. NSW Police to also be notified immediately upon discovery of human remains.	Site Project Manager
NSW Environmental Protection Agency	Details of pollution incident – who, what, when, where, how, any other supporting information and evidence (e.g. photos)	Immediately upon identification of pollution incident causing or threatening material harm to the environment, in accordance with ***KT's Construction site Incident and Emergency Procedures Thredbo, version 1.1***.	KT Environmental Manager

5.2.5 Competence and Training

All Project staff will be made aware of the site-specific environmental controls through a site induction, and pre-start meetings / toolbox talks prior to the commencement of construction.

The site induction will cover the following key aspects:

- roles and responsibilities;
- overview of environmental risks and specific locations of environmental and/or cultural heritage significance;
- the scope of legislative requirements and other licences and approvals;
- communication and notification requirements e.g. procedures for notifying and reporting incidents and complaints;
- environmental management and controls stipulated in this SEMP;
- workplace health and safety issues;
- emergency preparedness and response; and
- procedures for notifying and reporting incidents and complaints.

5.3 Environmental Incident and Emergency Response

All Project personnel are required to follow KT's **Construction site Incident and Emergency Procedures Thredbo Village, version 1.1.** The procedure will be available on-site and all Project staff will be trained on their implementation through the site induction. The procedure classifies

examples of emergencies and incidents and provides specific procedures for response to such events, such as:

- Serious injuries requirement urgent medical help.
- There are threats to property or life.
- Criminal activity e.g. you have witnessed a serious crime or accident.
- Sewer or water service breaks.
- Bushfire, building fire, spot fire on-site.
- Electricity service faults.
- Leaking gas.
- Fires and explosions.
- Release of pollution e.g. release of sediment into watercourse, chemical spill.

The procedure also outlines general site management principles, incident reporting and notification requirements and provides an emergency contacts list.

In the event of an environmental incident, emergency or near-miss, the following steps should be taken:

1) **STOP** works in the area and if safe to do so ensure the safety of personnel within the vicinity.
2) **NOTIFY** relevant persons e.g. emergency services or Construction Manager.
3) **ISOLATE** the risk or hazard e.g. turn off machinery/plant, implement immediate site controls, set up exclusion zone. and
4) **REPORT** and notify relevant persons (e.g. Project Manager, regulatory agencies).

Environmental incident and near-miss reporting requirements are detailed in **Section 7.3**. Contact details for key Project personnel and emergency services are provided in **Table 2**.

External contractors are required to prepare and implement an emergency and incident response procedure. The contractor will be responsible for responding to any environmental emergency caused by any action (or inaction) of the contractor's staff, including notification requirements to external parties such as EPA and Fire, Fire and Rescue NSW.

6 Environmental Controls

6.1 General

- Ensure works are conducted by suitably qualified and trained personnel.
- Ensure all site environmental management controls relevant to that stage of work are implemented in accordance with the approved plans and conditions of consent.
- Provide approved plans and relevant documentation in the site office or other suitable location so that they are easily accessible by all construction staff.

6.1.1 Site Establishment

- Establishment of site boundary with temporary fencing, rope or flagging to clearly delineate the construction corridor and "no-go" areas, including the BV mapped areas.
- Erection of site signage and pedestrian/traffic controls.
- Installation of erosion and sediment controls.

6.1.2 Machinery, equipment and materials

- Prior to site mobilisation, all equipment, machinery and vehicles used during construction of the Development must be cleaned prior to entry into the Park, or if already within Thredbo Alpine Resort cleaned prior to redeployment to the site, to ensure they are free of mud and vegetative propagules.
- Equipment, machinery, and vehicles must be regularly maintained and manoeuvred to prevent the spread of exotic vegetation.
- Storage of equipment, machinery, vehicles and material is to be restricted to existing disturbed areas (i.e. at the stockpile, formed roads and within the construction corridors) and avoid undisturbed areas. Storage of equipment, machinery, vehicles and material is to be restricted to existing disturbed areas (i.e. at the stockpile and staging areas proposed on ski slopes) and not be stored on native vegetation.
- All vehicles and machinery entering Thredbo must adhere to the **Standard Operating Procedure: Use and Maintenance of Wash Down Bay, March 2019 (KT055).**
- On-ground machinery used in vegetation removal and trail construction must adhere to the following:
    - the tread width of on-ground machinery used in trail construction must not exceed 1500 mm
    - disturbance/works must be entirely contained within the 3 m disturbance corridor.

6.2 Soil and Water Quality

Soil and Water Quality		
Objective	Minimise potential impacts to receiving water sources; and Reduce the potential for erosion and sediment moving offsite.	
Mitigation Measures		**Timing**
Soil and stockpile management • All stockpiles will be constructed and managed in accordance with *Soil Stockpile Guidelines for the Resort Areas of Kosciuszko National Park* (OEH 2017). • Temporary stockpile sites within the construction corridor should adhere to the criteria outlined Appendix C**.** • Any excess excavated material will be removed from site and transported to the designated soil stockpiles sites in Appendix B.		Construction
Top soil removal and disposal • All top soil removed from the Subject site during works which are part of the Development must be reused directly in the further construction of the Development. • No top soil may be stockpiled except at approved stockpiling sites in accordance with the Stockpile Guide. • If top soil needs to be stockpiled for later use, then it must be categorised (for appropriate future use e.g. topsoil for rehabilitation) and stored in accordance with the Stockpile Guide at an approved location. • If further top soil is required for use in the Development, the Applicant must ensure: o the top soil is brought in from other stockpile sites in the Thredbo Alpine Resort or sources otherwise authorised by NPWS;		Top soil removal and disposal

○ the top soil is free of contaminants, weeds and other vegetative propagules; and ○ prior to stockpiling, the top soil originated from a source with altitude and ecosystem attributes similar to those of the Subject site.	
• Vehicle and machinery movement would be restricted to existing access tracks and the construction corridor.	Construction
• Implement Erosion and Sediment Control Plan. All erosion and sediment control devices will be inspected regularly (including immediately after rainfall) and will be maintained and repaired as necessary so that they remain effective for the works duration.	Construction
• Erosion and sediment controls to be inspected and maintained regularly, particularly immediately following rain events.	Construction
• Construction works should not be undertaken in periods of significant rainfall.	Construction
Performance Criteria	No significant sediment deposition observed leaving the site.
Corrective Actions	If sediment is observed leaving the site, identify the source and amend the ESCs on-site to ensure appropriate controls are in place. If required, additional ESCs to be installed.

6.3 Flora and Fauna

6.3.1 Vegetation and Habitat

Vegetation and Habitat	
Objective	To ensure compliance with legislative requirements and protect existing native vegetation. Minimise impacts to native vegetation.
Mitigation Measures	**Timing**
• All clearing must only occur within approved development corridor. The construction corridor is to be clearly identified with flagging tape to mark no-go/no clearing zones prior to construction (ELA 2023). Mature trees and rocks required to be removed are to be clearly identified.	Vegetation clearing
• Brief all works as to limit of disturbance footprint and other environmental safeguards (ELA 2023)	Prior to and during construction as necessary
Tree removal and rock removal protocols • Trees to be removed must be clearly marked • To the extent reasonably practicable, trail alignment must be adjusted to avoid the removal of mature trees, large boulders and rock outcrops. Mature trees and rocks required to be removed must be clearly marked. • Any trees required to be removed must not be felled in a manner which damages surrounding vegetation. All vegetation (trees and understory) removed must either be cut into smaller pieces to be used for rehabilitation, discreetly dispersed amongst adjoining native vegetation without damaging existing native vegetation or	Prior to removal of approved tree species and rocks

removed from site completely if it contains any exotic vegetation species. • All clearing must occur solely within approved development corridors and to be clearly identified with flagging tape to mark no-go/no clearing zones prior to construction. • All vegetation must be checked for fauna habitats and fauna by the proponent's Environmental Officer immediately prior to felling/removal. Vegetation with active nests must not be removed until the young have left the nest. If fauna is present, then the proponent must contact NPWS to assist with mitigation actions. • Construction staff and contractors undertaking vegetation clearance for the development must be able to accurately identify *Podocarpus lawrencei* (Mountain Plum Pine) and *Ranunculus anemoneus* (Anemone Buttercup). These species of conservation significance must be avoided when creating the trail corridor, and protected from trampling by foot, equipment or the placement of construction material. • All rocks removed during the works must be placed in the surrounding landscape without damaging existing native vegetation, used in the trail construction (e.g. rock armouring) or removed from site completely. • To the extent reasonably practicable, any live tree roots must be protected (and not removed) within the timbered areas of the trail corridor. This could occur through rock armouring, grade reversals or other construction methods.	
• Clearing should remove habitats in stages to allow movement of fauna away from disturbed areas.	Vegetation clearing
Excepting exotic vegetation (which must be removed from the Project site) all vegetation removed for the Development: a) must be used to assist in stabilisation or rehabilitation of the Subject site; b) may be cut, chipped or shredded for reuse as native brush matting in rehabilitation; or c) if it cannot be used for the purposes in paragraphs (a) or (b) then it may be stockpiled at an appropriate location in Thredbo Alpine Resort, for re-use on other landscaping or rehabilitation projects, or for firewood or similar.	Vegetation removal and disposal
• All machinery to be used during the construction phase should be limited to the existing disturbed areas and access tracks.	Vegetation clearing & construction
• Progressive rehabilitation is to be undertaken in accordance with the Rehabilitation and Monitoring Plan. All rehabilitation should be undertaken in accordance with the *Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park* (DECC 2007).	Construction & post-construction
Performance Criteria	No damage to site fencing. No damage to native vegetation (including vehicle tracks) associated with unauthorised access.
Corrective Actions	Fencing to be repaired / reinstated by appointed contractor. Entry points for unauthorised access to be identified and access restricted through fencing or other appropriate barriers.

6.3.2 Native Fauna

Native Fauna Management	
Objective	To minimise potential impacts to native fauna, their breeding places and habitat.
Mitigation Measures	**Timing**
• The trail should be aligned during construction as necessary to avoid any wombat burrows that are detected in close proximity to the trail. NPWS should be contacted if any animals are disturbed or injured during the proposed works (ELA 2023).	Prior to vegetation clearing works & prior to construction
• Maintain a clean and tidy work area to ensure animals are not attracted to the site, including provision of covered bins during proposed works.	Construction
Performance Criteria	No death or injury to fauna as a result of on-site activities. No disturbance outside the approval disturbance area.
Corrective Actions	Review and implement suitable strategies to dissuade fauna from coming to site. Contact NPWS / LAOKO if injured fauna is identified as a result of site activities.

6.3.3 Exotic Species

Exotic Species Management	
Objective	To reduce the risk of introducing invasive/pest species.
Mitigation Measures	**Timing**
• All relevant weed species that occur within the construction corridor and associated staging and stockpile sites must be treated prior to works commencing to ensure these weeds are not spread further at the site or within KNP.	Prior to vegetation clearing & prior to construction
• If an area of vegetation proposed for removal includes any relevant weed species then the vegetation must be removed completely from site, not spread out within the existing vegetation or used in rehabilitation and stabilisation works.	Prior to vegetation clearing & prior to construction
• All machinery and equipment used during construction must be cleaned prior to entry into KNP and prior to site mobilisation to ensure the machinery is free of mud, vegetative propagules, and pathogens. This includes machinery that may have been working in an area of the resort that contains weeds and is preparing to be redeployed in the construction corridor and associated stockpile and staging areas (ELA 2023).	Construction
• All vehicles and machinery entering Thredbo must adhere to the Standard Operating Procedure: Use and Maintenance of Wash Down Bay, March 2019 (KT055). The wash down bay is located at the Thredbo Waste Transfer Station for use by KT staff and contractors.	Construction
• All machinery and equipment must be stored on existing disturbed areas (i.e. at the stockpile and staging areas proposed on the ski slopes) and should not be stored on native vegetation.	Construction
• All machinery to be regularly maintained and manoeuvred to prevent the spread of weeds and pathogens.	Construction
Performance Criteria	No introduction of invasive species as a result of construction activities.
Corrective Actions	Review existing biosecurity procedures (e.g. clean down procedure) and implement additional controls if required.

6.4 Air Quality

Air Quality Management		
Objective	To minimise potential impacts on sensitive receivers from dust and other air pollution from construction activities.	
Mitigation Measures		**Timing**
• Dust generation will be managed through typical dust suppression that will include covering stockpiled spoil, minimising ground disturbance and covering loads.		Vegetation clearing & construction
• Plant and equipment to be maintained and operated in an efficient manner to reduce air pollution.		Construction
• Vehicles are to adhere to speed limits to minimise dust general and potential spill of hauled materials.		Construction
• All vehicles carrying spoil or rubble to/from site should be covered to prevent the escape of dust or other material. Covers are to be adequately secured.		Construction
Performance Criteria	No complaints received in relation to air pollution.	
Corrective Actions	If complaints are received, the following steps should be taken: • Investigate specific cause of complaint. • Review site activities/processes and identify the source of air emissions. • Implement immediate corrective actions on-site e.g. water site, replace equipment deemed to be poorly maintained. • If required, implement administrative controls e.g. additional staff training, alter construction methods or timing for undertaking dust generating activities.	

6.5 Noise and Vibration

Noise and Vibration Management		
Objective	To ensure that noise and vibration from construction activities does not cause environmental nuisance in the locality.	
Mitigation Measures		**Timing**
• Awareness training and information will be provided to project personnel in relation to minimising noise pollution as much as practicable when in close proximity of sensitive receivers.		Site induction
• Selection of the most appropriate plant and equipment to minimise noise generation.		Prior to construction
• Construction works will be undertaken during standard work hours.		Construction
• Appropriate noise management strategies will be implemented for construction works and operation of plant in accordance with the Australian Standard AS 2436-2010 *Guide to noise and vibration control on construction, demolition and maintenance sites.*		Construction
• Regular checks are to be undertaken to ensure all equipment and vehicles are in good working order and are operated correctly.		Construction
• All plant will be maintained in accordance with the manufacturer's requirements.		Construction
Performance Criteria	No construction related noise and vibration complaints received. No unreasonable noise or vibration.	

Corrective Actions	If complaints are received, the following steps should be taken: • Investigate specific cause of complaint. • Review site activities/processes and identify the source of the noise emissions. • Implement immediate corrective actions e.g. swap out noisy equipment. • If required, implement administrative controls e.g. additional staff training or change work hours to minimise noise.

6.6 Fuels, Chemicals and Hazardous Substances

Fuels, Chemicals and Hazardous Substances	
Objective	Eliminate the potential for release of fuels, chemicals and hazardous substances to the environment.
Mitigation Measures	**Timing**
• Spill kits will be available onsite and all site personnel will be made aware of their locations in the site induction.	Construction
• In the event on an on-site spill, construction staff will follow KT's Construction Site Incident and Emergency Procedures Thredbo Village, version 1.1.	Construction
• Hazardous substances, toxic materials or dangerous goods must not be stored or processed on-site at any time without prior approval from the DPE Secretary or nominee.	Construction
• Fuel and chemicals will be appropriately stored and handled in accordance with relevant Australian Standards and Codes of Practice.	Construction
• Appropriate controls will be implemented when refuelling Project vehicles and machinery.	Construction
Performance Criteria	No fuel, chemical or hazardous substance spills.
Corrective Actions	Corrective actions will be taken in accordance with the **Construction Site Incident and Emergency Procedures Thredbo Village, version 1.1**, including: immediate spill response, implementation of any necessary control measures as directed by authorities. Where required, an investigation will be undertaken to determine the root cause.

6.7 Traffic and Access

Traffic and Access Management		
Objective	Minimise potential impacts on existing road network	
Mitigation Measures		**Timing**
• Traffic and construction vehicle access will be managed as per regular daily operation in the resort.		Construction
• All Project vehicles and machinery to adhere to speed limits and signage and stay within construction corridor.		Construction
• Bikers within proximity of the site will be managed though the use of signage and fencing/flagging as required.		Construction
Performance Criteria	No significant impacts to existing road network or users. No complaints in relation to traffic or vehicle operators.	
Corrective Actions	If complaints are received, traffic management procedures will be reviewed and amended (if necessary).	

6.8 Waste Management

The following waste receptacles will be provided for the storage and disposal of waste associated with the construction of the Project:

- General litter bins for waste such as food waste and non-recyclable plastic.
- Recycling bins for waste such as carboard packaging, paper, recyclable plastic.
- KT's waste transfer facility (materials to be segregated for re-use, recycling etc.).

Excess spoil from excavations will be taken off-site and placed within the resort's existing stockpile area located at the carpark adjacent to the Thredbo Waste Transfer Station for re-use within the resort.

Waste Management		
Objective	Minimise construction waste as much as practicable. Reduce the impact of waste on-site and beyond the site boundary.	
Mitigation Measures		**Timing**
• All waste will be managed and disposed of in accordance with the KT's waste management procedures.		Construction
• Where possible, construction materials will be salvaged for reuse to divert waste from landfill.		Construction
• All waste will be separated into waste streams and contained within appropriate receptacles and/or disposed of in accordance with the EPA guidelines.		Construction
• All receptacles will be in good condition.		Construction
• All waste transportation vehicles will be covered appropriately to ensure waste cannot spill, leak or escape onto the road or wash into stormwater drains.		Construction
• Ensure that the waste is being transported to a place that may be lawfully used as a waste facility.		Construction
Performance Criteria	No litter or waste material to be released from site in an uncontrolled manner.	
Corrective Actions	• Investigate cause of inappropriate waste disposal/management. • Review on-site waste handling facilities and implement corrective actions e.g. change in receptacle size and/or waste management signage. • If required, implement administrative controls e.g. additional waste management training for staff.	

6.8.1 Licenced Waste Facilities

There are two licenced waste facilities within proximity to Thredbo, including:

- Jindabyne Landfill, 6013 Kosciuszko Road, Jindabyne NSW
- Cooma Landfill, 8448 Monaro Highway, Cooma NSW.

6.9 Aboriginal Cultural Heritage

6.9.1 Unexpected Finds Procedure

Where unexpected items of potential archaeological, built or Aboriginal cultural heritage significance are discovered, Project personnel will follow the below procedure:

- **STOP:** Stop work and leave the site or item where it is.
- **NOTIFY:** Notify the Project Manager and NPWS to arrange for representatives to inspect the site. If human remains are found, the NSW Police must also be notified.
- **MANAGE:** Management may involve securing the find by erecting a no-go zone.
- **REPORT:** The Project Manager will complete any reporting requirements, as directed by NPWS.

6.10 Bushfire Protection

The construction contractor is responsible for determining relevant requirements for the site and ensuring staff are aware of bushfire avoidance, evacuation, and management measures.

The **Construction Site Incident and Emergency Procedure, version 1.1** outlines procedures for responding to fire and bushfire incidents or emergencies. This procedure is made available to all construction staff. In the event of a bushfire, Kosciuszko Thredbo (the head lessee) would implement the resort-wide Bushfire Evacuation Plan. The plan has been designed to assist management and emergency services to protect life and property in the event of a bush fire or other emergency.

7 Monitoring and Reporting

7.1 Environmental Monitoring

The Environmental Officer will conduct monitoring during all project phases (pre-construction, during construction and post-construction) to ensure compliance with this SEMP, associated management plans and conditions of approval.

The Environmental Officer will undertake weekly inspections utilising the **Site Environmental Management Measures Report**. The report includes a checklist on the following matters:

- Administration (weekly site inspections, sub-contractor environmental management, environmental monitoring, environment incidents, complaints handling, reporting and record keeping)
- Biosecurity management
- Chemical spills / emergency response
- Vegetation management and rehabilitation
- Waste management
- Native fauna management
- Material storage and sourcing
- Water quality
- Erosion and sediment controls
- Stockpile management
- Air quality and noise and vibration
- Cultural heritage
- Safety.

7.2 Weekly Environmental Reporting

The Environmental Officer will provide copies of the **Site Environmental Management Measures Report** to the Project Manager on a weekly basis. All records will be stored within KT's files and distributed to relevant persons / regulatory authorities as required.

7.3 Environmental Incident Reporting

All incidents and near misses will be managed in accordance with KT's **Construction site Incident and Emergency Procedures Thredbo Village, version 1.1**. The document provides procedures for responding to incidents and emergences, reporting and notification requirements and emergency contacts.

The following information should be recorded:

- Time and date of the incident / near miss
- A description of the incident / near miss
- A sequence of events that led to the incident / near miss occurring
- Person/s involved in the incident / near miss (including witnesses)
- Written statements from person/s involved (as applicable)
- Details of corrective actions.

The **Environmental Incident Report Form** should be completed for all environmental incidents. All parts of the form must be completed in accordance with KT's incident procedure and following the instructions within the form. The form must be signed by the person making the report and the Project Manager/person in charge of the site/activity.

7.4 Non-conformance

A non-conformance is the failure to comply with the requirements of this SEMP and supporting management plans. Non-conformances identified via site inspection or during day-to-day activities will be documented on the **Site Environmental Management Measures Report** (or similar contractor's form) and closed out in subsequent inspections. The Environmental Officer is responsible for investigation and managing corrective and preventative actions in the event of non-conformance or a situation likely to cause environmental harm.

7.5 Corrective Actions

Corrective actions should be prioritised on the following hierarchy of controls:

1. **Elimination** – can activities and processes be eliminated to reduce the risk of reoccurrence?
2. **Substitution** – can activities be substituted with another activity of lesser risk?
3. **Isolation** – can you isolate the hazard from any person exposed to it?
4. **Engineering controls** – can you reduce the risk of reoccurrence through engineering changes?
5. **Administrative controls** – can a change in work practices, additional training or additional checks reduce the risk?
6. **Personal Protective Equipment (PPE)** – can PPE be worn to protect personnel from harm?

The Construction Manager will be responsible for managing the implementation of corrective actions on-site.

7.6 Complaints Management

Should complaints be received from the public in relation to the Project they will be recorded using the **Complaints Form** (or similar contractor's form). The Project Manager will be responsible for

investigating, recording and closing out any complaints received. All records will be stored within KT's files and distributed to relevant persons / regulatory authorities as required.

8 Record Keeping and Review

8.1 Document Control

All Project related documentation will be maintained within KT's Project file. Documents stored within the file include (but not limited to) the following:

- Copies of relevant planning approvals and documents, licences and permits.
- All completed induction forms and visitor sign-on register.
- Records of routine environmental inspections.
- Records of any environmental incidents, complaints, non-conformances and no-compliances.

8.2 SEMP Review

This SEMP is a live document and will undergo reviews and amendments as necessary. Reviews will generally be undertaken –

- If there is a change in the scope of the Project.
- Prior to commencement of construction to ensure any relevant conditions of consent and/or other approval, licence or permit requirements are incorporated.
- If there is a need to improve environmental controls to protect environmental values.
- If there is an increase or introduction of a new environmental risk or impacts.
- At the end of a Project to allow for improvements in subsequent Projects.

9 References

Department of Environment and Climate Change (DECC) 2007, Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park, NSW Government.

Department of Environment and Climate Change (DECC) 2009, Interim Construction Noise Guideline, July 2009, https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/09265cng.pdf?la=en&hash=EF4576FD79DBB25D5AC22DFA1A883A2BADA1F77B

Department of Infrastructure, Planning and Natural Resources (DIPNR) 2004*, Guideline for the Preparation of Environmental Management Plans*, https://www.planning.nsw.gov.au/~/media/Files/DPE/Guidelines/guideline-for-the-preparation-of-environmental-management-plans-2004.ashx?la=en

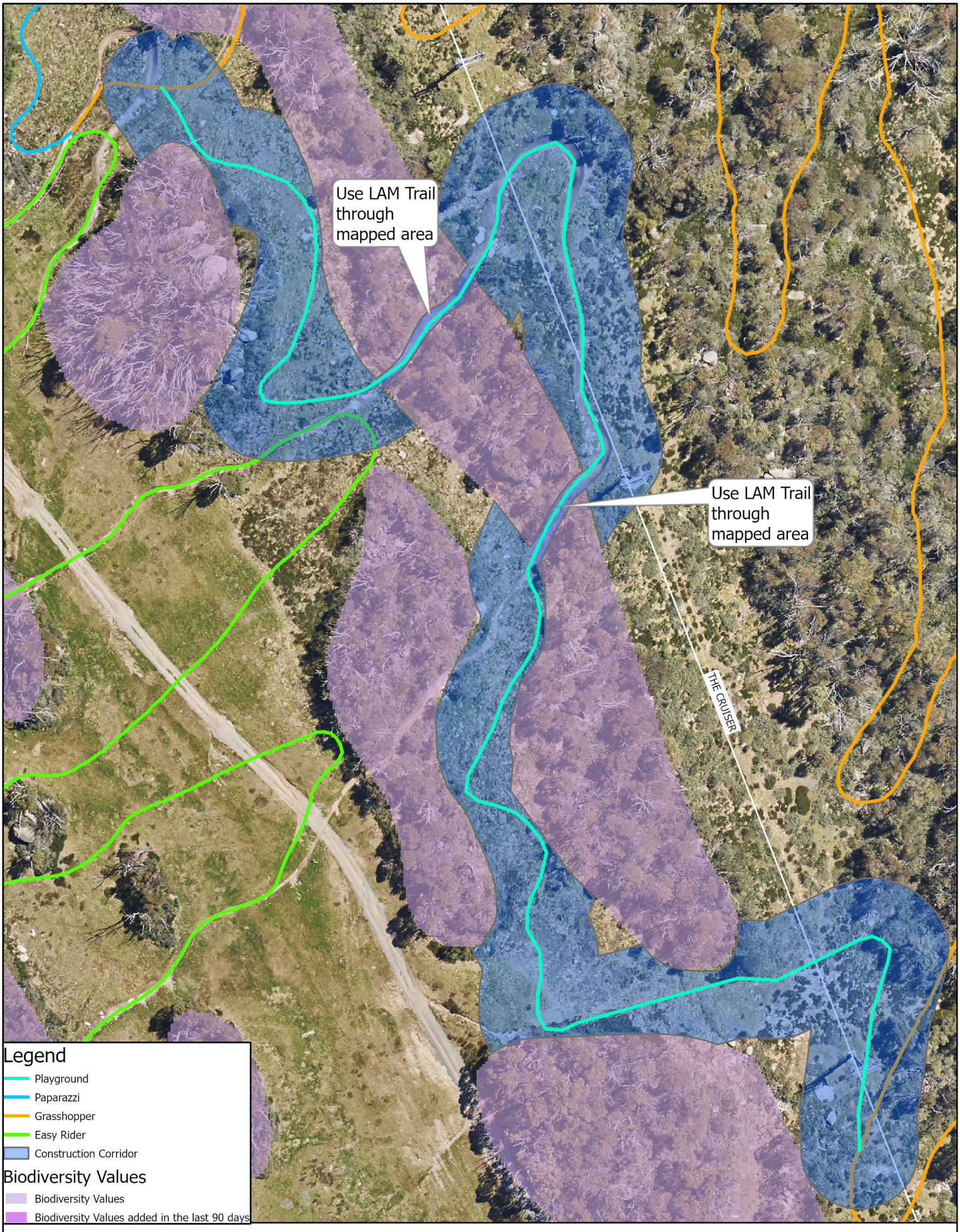
Department of Planning & Environment (DPE) (2017) *What to include with your development application*, version January 2017, https://www.planning.nsw.gov.au/Policy-and-Legislation/~/media/65E2BA89886F426991525FF25707A9A9.ashx

Eco Logical Australia Pty Ltd 2023, Flora and Fauna Assessment – Playground MTB Trail Thredbo Alpine Resort.

Office of Environment and Heritage (OEH) 2017, *Soil Stockpile Guidelines for the Resort Areas of Kosciuszko National Park, version 1.0, October 2017*, NSW National Parks and Wildlife Service.

10 Appendices

Appendix A Site Plans



Scale: 1:815

5.5 2.750 5.5 11 16.5 22

Meters

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

N

THREDBO

SITE PLAN

Project: Playground

Revision: 2

Date: 20/10/2023

Produced By: BB

Appendix B Stockpile and Material Storage Areas

0 4.5 9 18 27 36 Meters

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

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THREDBO

STOCKPILE AND MATERIAL STORAGE LOCATION WASTE TRASFER FACILITY

Revision: A

Date: 14/09/2023

Produced By: KOS

Appendix C Erosion and Sediment Control Plan

Erosion and Sediment Control Plan

Playground Mountain Bike Trail

PURPOSE

The purpose of this Erosion and Sediment Control Plan is to outline the intentions and fundamental principles that will be followed in the planning and implementation of erosion and sediment control (ESC) measures for the project during construction.

OBJECTIVES

To minimise potential impacts from construction works to receiving waters.

To reduce the potential for erosion and sediment moving offsite.

SCOPE OF THIS PLAN

This plan identifies appropriate controls specific to project activities to prevent sedimentation and pollution of receiving waters and minimise potential impacts on vegetation communities with and adjacent to the site.

GUIDELINES

- Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition (Landcom 2004)
- IECA Best Practice Erosion and Sediment Control
- Erosion and Sediment Control: A field Guide for Construction Site Managers (Catchments & Creeks Pty Ltd, 2012)

EROSION AND SEDIMENT CONTROLS

Implementation of appropriate controls and locations will be the responsibility of the construction contractor. Controls to be installed prior to any construction work (where required) and retain in place until exposed areas of soil or vegetation are stabilised/rehabilitated.

Sediment fencing and straw bale filter fencing is to be utilised during construction of the trail and stockpiling, as required. Controls are to be installed prior to works and retained in place until exposed areas of soil are stabilised.

Sediment Fence

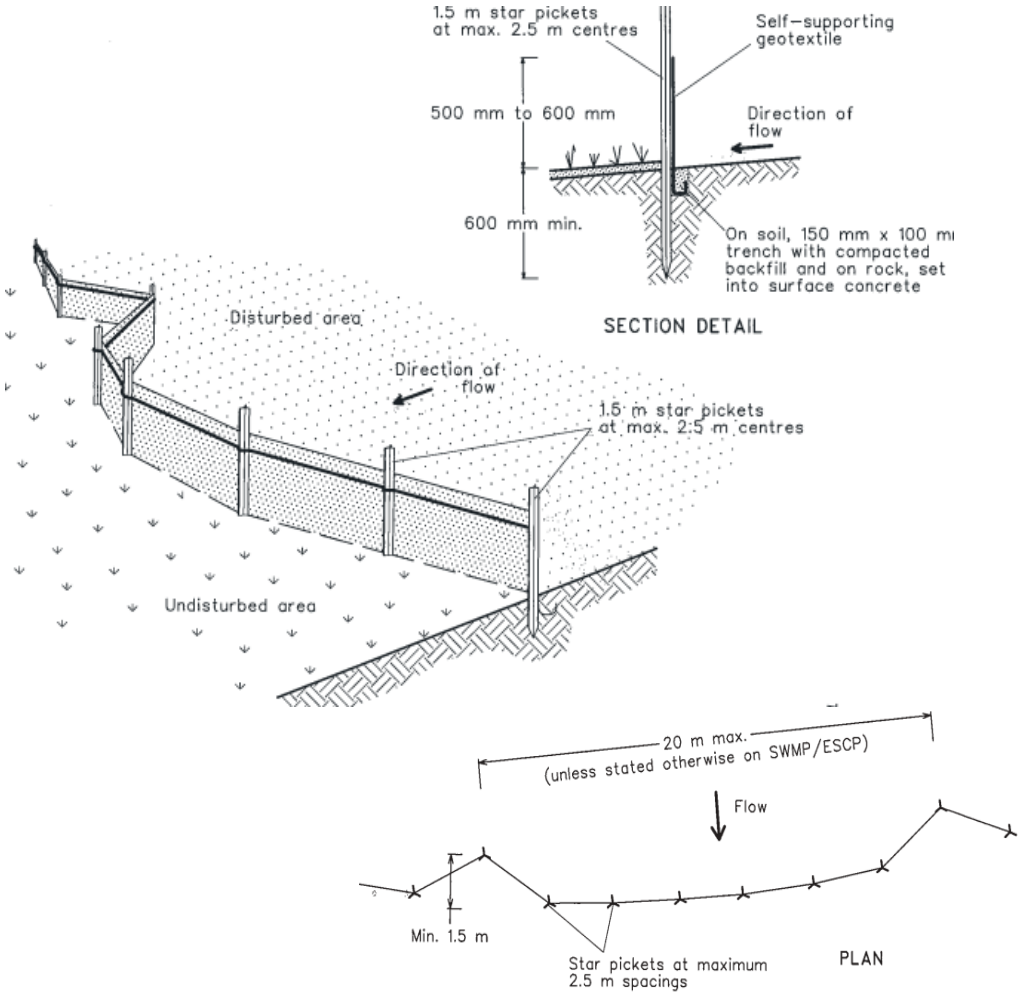
The purpose of sediment fencing is to prevent sediment run-off and divert water around and away from disturbed areas. Sediment fencing should be used on the downslope side of works area, wetter areas and surrounding stockpiles.

Construction notes:

1) Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns to limit the catchment area of any one section. **The catchment area*

should be small enough to limit water flow if concentrated at one point to 50 L/s in the design storm event, usually the 10-year event.

2) Dig a 150 mm deep trench along upslope line of fence for the bottom of the fabric to be entrenched.
3) Install 1.5 m long star pickets into ground at 2.5 m intervals (max) on the downslope edge of the trench. **Fit star pickets with safety caps.*
4) Fix geotextile to the upslope side of the posts ensuring it goes to the base of the trench.



Standard Sediment Fence Installation (Source: Landcom 2004)

Straw Bale Filter Fence

Straw bales may be used to divert water around and away from disturbance areas during down-slope and cross-slope excavations. Straw bales are to be used on the uphill side of works area running cross-slope.

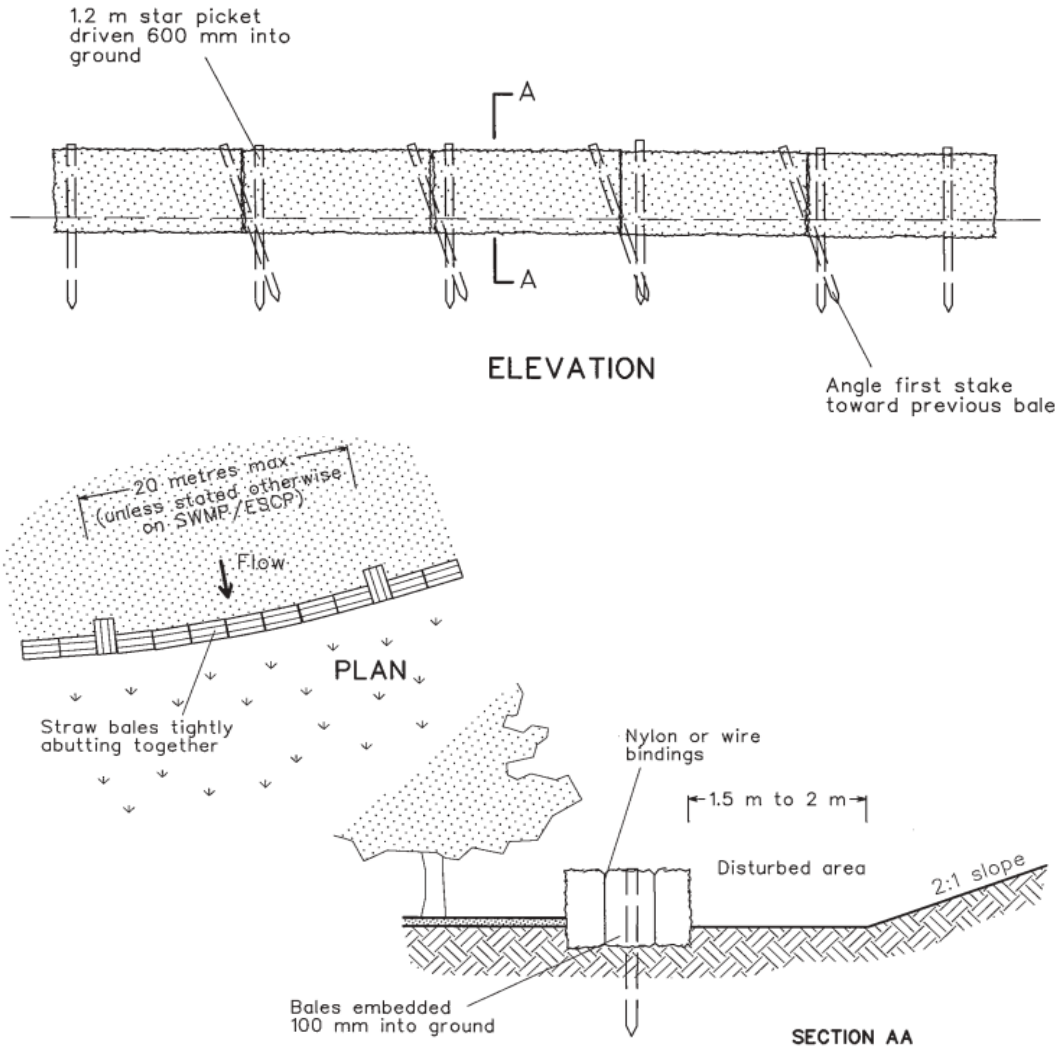
Construction notes:

1) Construct the straw bale filter as close as possible to being parallel to the contours of the site.

2) Place bales lengthwise in a row with ends tightly abutting (1 bale = max height of filter). Fill gaps between bales with straw and wrap with geofabric where necessary.

3) Embed each bale in the ground 75-100 mm and anchor with two 1.2 m stakes/star picket. Angle the first stake in each bale towards the previously laid bale. Stakes should be driven 600 mm into ground, sitting flush with top of bale (if possible). **If using star pickets which protrude above bales, fit with safety caps.*

4) Where a straw bale filter is constructed downslope from a disturbed batter, ensure the bales are placed 1-2 m downslope from the toe.



Standard Straw Bale Filter Installation (Source: Landcom 2004)

Cross Drainage and Sediment Barriers

The recommended spacing for cross drainage and sediment barriers is provided below.

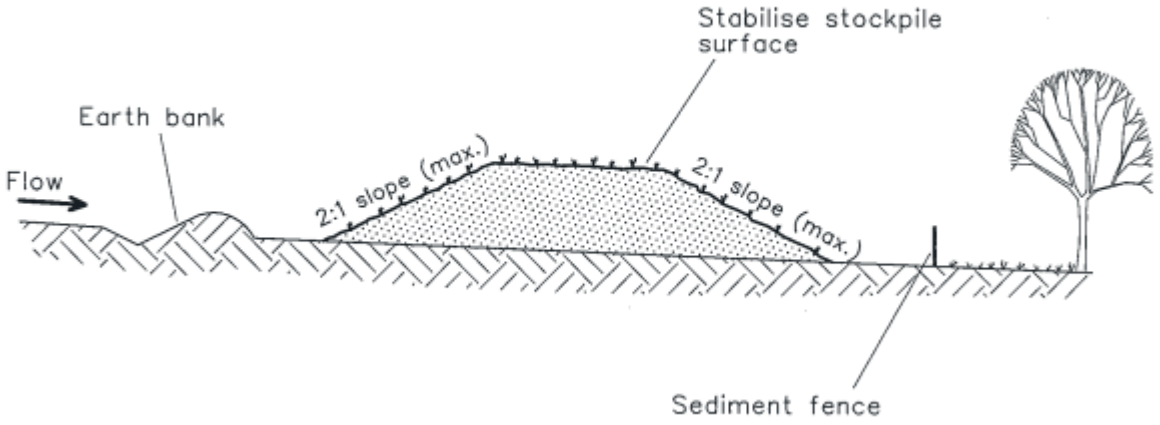
Slope Grade (%)	Cross Drain / Sediment Barrier (m)
5-10	15-20
10-15	10-15

15-25	8-10
>25	5-8

Source: NPWS 2007; Parr-Smith and Polley (1998)
Note: To calculate the grade of a slope: (rise/run) x 100 = slope grade

Soil and Stockpile Management

- All stockpiles will be constructed and managed in accordance with *Soil Stockpile Guidelines for the Resort Areas of Kosciuszko National Park* (OEH 2017).
- Temporary stockpile sites within the construction corridor should adhere to the following criteria (Landcom 2004; OEH 2007):
  - not exceed 2 m in height, have a slope <50% (26°)
  - be at least 2 m from vegetation, concentrated water flows, roads, publicly accessible areas or hazardous areas
  - avoid impacts to native vegetation and be located on disturbed areas
  - located directly adjacent to the works
  - located on relatively flat ground, where possible
  - in areas with sufficient room to accommodate the volume of material being stockpiled
  - be contained by appropriate erosion and sediment controls.
- Any excess excavated material will be removed from site and transported to the designated soil stockpiles sites.



Stockpile Management (Source: Landcom 2004)

Appendix D Environmental Schedules

THREDBO ENVIRONMENTAL SERVICES

Record of complaint

Sheet _____of_____

Project: _____ Date / Time: _____

Received by: _____ Reference Number: _____

Complainant details:	Witness details:

Nature of complaint:

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..... Complainant sign:

Action taken:

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Kosciuszko Thredbo Pty Ltd

Environmental Incident Reporting Form

Confidential document after first entry

The purpose of this form is to report any incident that may have resulted in Environmental harm on Kosciuszko Thredbo Pty Ltd premises. Remember to be succinct, stick to the facts and do not make assumptions. Only record information you know to be correct.

The only persons authorised to contact external agencies eg EPA in relation to environmental incidents are the Kosciuszko Thredbo General Manager and Environmental Services Manager or their approved delegates.

Return completed form to the Environmental Services Manager as soon as practicle, on completion of the Environmental incident.

Date of Incident:	**Time of incident:**
Reported by:	**Department:**

Location of Incident

EXACT location of the incident (include landmarks and features, nearest cross street etc to make it easier to identify later)		
Site:	Building:	Room:

Description of incident

Provide description and extent of incident: …… …… …… …… ……
Have relevant photos been taken and attached? Yes ☐ No ☐
If 'No', provide sketch and attach to the rear of this document.
What was the estimated duration of the incident?

Type of incident

☐ Spill (including fuel,oil,waste material or other polluting substance)	☐ Erosion and sedimentation incident	☐ Contaminated water discharge
☐ Noise emission/complaint	☐ Unauthorised/accidental damage to heritage item	☐ Unauthorised/accidental vegetation removal or harm
☐ Air Emission	☐ Wildlife habitat/nesting area disturbed	☐ Other (specify)

Environmental Incident Reporting Form

Level of incident

Level	Example
☐ Minor	eg. No material has escaped the site or caused material harm to the environment – it is easy to clean up without additional assistance.
☐ Major	eg. Material has escaped the site causing pollution downhill/downstream areas, which will require clean up involving other agencies and/or additional resources not available to local site management. Damage has occurred or is likely to occur to the environment.

Hazardous Material Spilt

☐ Petroleum based products/ Hydrocarbons	☐ Chemicals domestic or industrial grade
☐ Biological waste / Clinical and related waste	☐ PCB insulating liquids
☐ CFC containing equipment	☐ Paints or paint products
☐ Radioactive waste	☐ Other (specify)
Detail type/ingredient spilt: (UN, MSDS details)	
Detail concentration of material spilt:	
Detail quantity of material spilt:	

Type of Spill

☐ Spilt onto ground	☐ Spilt into stormwater drain
☐ Spilt into waterway	☐ Poured down sink
☐ Poured down sewer	☐ Released into atmosphere
☐ Caused odour	☐ Caused fire/explosion
☐ Caused infectious contamination	☐ Other (specify)

Immediate Actions

Was spill contained? Yes ☐ No ☐
Detail immediate actions/controls measures taken to rectify or contain the incident …… …… …… …… …… …… …… ……

Environmental Incident Reporting Form

Corrective Actions

Detail corrective clean up action taken

……

……

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Disposal

Detail disposal method/plans and location

……

……

……

Recommended follow up and preventative actions

Detail recommendations

……

……

……

Persons present at Incident

Were there any witnesses to the accident? Yes ☐ No ☐ If 'Yes', please provide names

……

……

Declaration

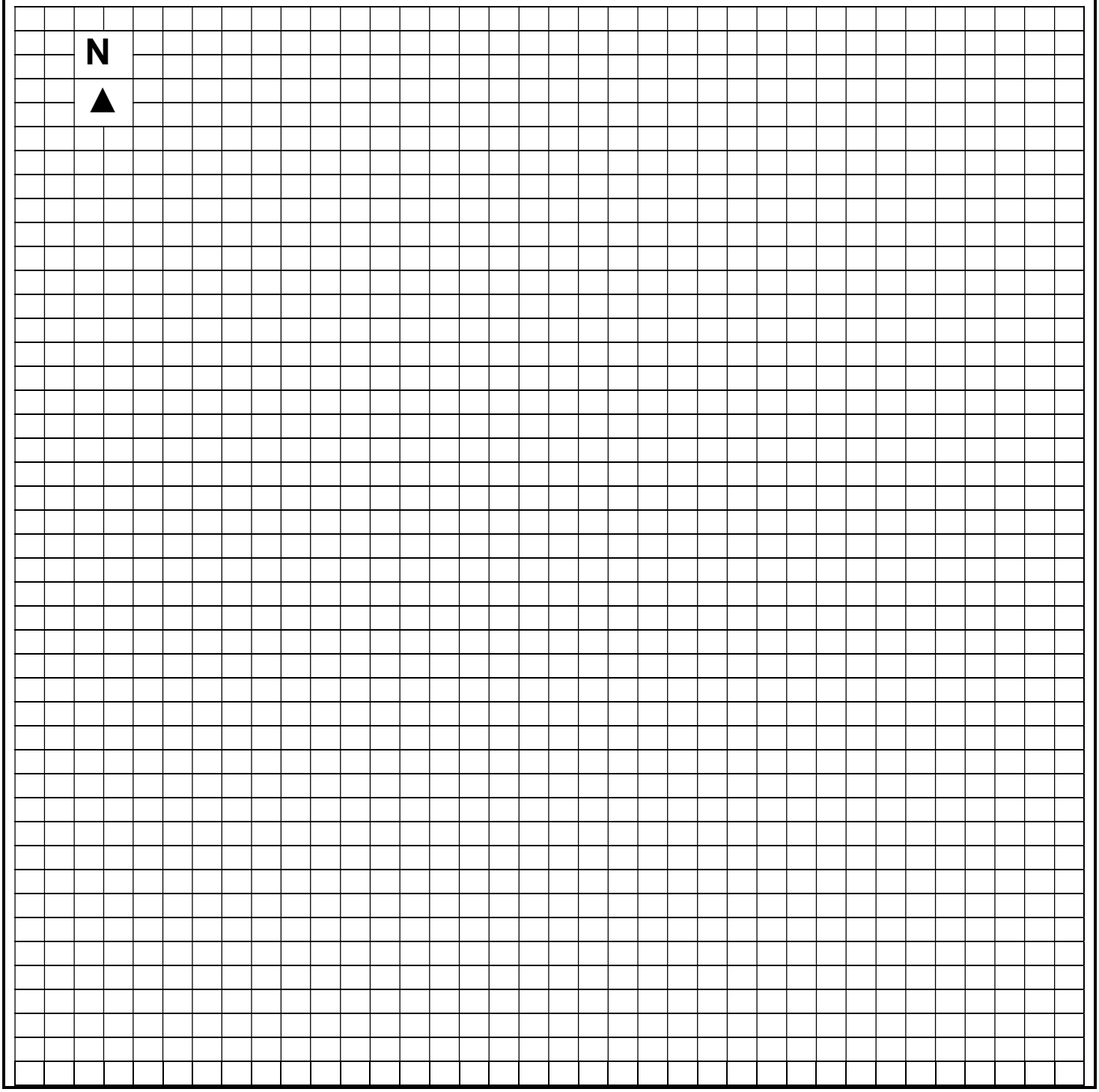
The information and answers given above are true in every detail and no information has been withheld.

Departmental Supervisors Name	
Departmental Supervisors signature	*Date*

Departmental Managers Name	
Departmental Managers signature	*Date*

Environmental Incident Reporting Form

Diagram: (do not scale)



Created By: Paul Corcoran
Created Date: 24 Mar 2009
Review Date: 24 Mar 2017
Reviewed Date: 7th January 2020, by E Diver

Appendix E Rehabilitation and Monitoring Plan

Construction of Mountain Bike Trails

Playground

Detailed Rehabilitation and Monitoring Plan

Table of Contents

1 Introduction

This rehabilitation and monitoring plan has been prepared to detail the rehabilitation required for all areas disturbed by the construction works associated with the development. The rehabilitation activities consist of trail verge stabilisation and revegetation works.

1.1 Aims and Objectives

The aim of this plan is to achieve successful rehabilitation of all areas disturbed by the works with full vegetation coverage to achieve an erosion resistant state. The objectives of this rehabilitation plan are:

- Detail the rehabilitation works required by the proposal for all disturbed areas;
- Set out the schedule for the rehabilitation activities;
- Provide information on plant species and planting ratios; and
- Dictate the maintenance and monitoring of the disturbed and rehabilitation areas.

2 Rehabilitation Program

2.1 Rehabilitation Areas

The areas to be rehabilitated consist of all areas disturbed as a component of the works. These areas include the verges of the completed trail, existing sections of trail and any disturbed areas adjacent to the works. The development areas are shown in Appendix 1.

2.2 Rehabilitation and Stabilisation

The rehabilitation and stabilisation works will be consistent with the Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park (NPWS). The works are to be carried out by Kosciuszko Thredbo Pty Ltd (KT) staff or suitable contractor on KT's behalf. Methods will consist of:

Timing	Procedure	Methods
Pre-construction	Establish construction corridor & trail alignment	• Flag trail alignment using pin flags and flagging tape • Mark out construction corridor to prevent damage to adjacent areas
	Treatment of weeds	• Treat weeds within disturbance area to ensure they are not spread further using methods relevant to the weed species being treated
	Identify trees to be removed	• Clearly identify any trees to be removed with flagging tape and inspect for nests / fauna • Alignment of trail is to avoid clearance of mature canopy vegetation
	Implement Site Environmental Management Measures	• Erosion & sediment controls to be put in place prior to construction where possible and during construction
	Cleaning of machinery	• Ensure all machinery to be used on construction site is cleaned at wash down bay to prevent spread of weed species in resort

	Identify "No Go" areas	• Identify & mark "No Go" areas to clearly delineate sensitive areas to be avoided
	Identify *Podocarpus lawrencei* (Mountain Plum Pine)	• Identify and mark out *Podocarpus lawrencei* • Alignment of trail is to avoid *Podocarpus lawrencei* • Ensure KT staff/contractors are able to accurately identify
	Identify *Ranunculus anemoneus* (Anemone Buttercup)	• Identify and mark out *Ranunculus anemoneus* in order to minimise and mitigate impacts during construction works • Alignment of trail is to avoid *Ranunculus anemoneus* • Ensure KT staff/contractors are able to accurately identify • Environmental Officer to GPS record location of *Ranunculus anemoneus* for on-going monitoring
	Identify set down and stockpile areas	• Identify and mark out appropriate plant & equipment set down areas for short term placement of machinery & materials avoiding areas of native vegetation • Set down areas are to be located within trail construction zone, identified stockpile site or site compound only and strictly adhered to
	Identify wombat burrows	• Identify and mark out wombat burrows within the construction corridor • Trail alignment is to avoid wombat burrows
During Construction	Minimise disturbance & stay within trail corridor	• Minimise disturbance to adjacent native vegetation • Limit movement of construction equipment to construction area and nominated set down areas
	Identify *Ranunculus anemoneus* (Anemone Buttercup)	• If *Ranunculus anemoneus* is discovered on the trail alignment during the course of construction that has not been previously identified, Environmental Officer is to be contacted immediately and works are to cease in that area • Environmental Officer and trails supervisor to determine if trail alignment can be moved within the flexible construction corridor of 20m (10m either side of the ground-truthed alignment) to avoid • If trail alignment is unable to be altered, KT is to consult NPWS regarding most appropriate action
	Regularly maintain site environmental management measures	• Conduct regular inspections and maintenance of sediment and erosion controls
	Sod cutting, collection & storage (as per Rehabilitation Guidelines for the Resort Areas of KNP)	• Native forbs and grasses are the most appropriate for sodding • Where sod collection is possible, cut sods to a depth of 10-20cm (leaving a layer of intact topsoil underneath) and to a size of 30cm^2 • Store sods collected on geofabric adjacent to the construction area

		• Sod storage time to be kept to a minimum and sods to be utilised as soon as possible after cutting and storage • Monitor sods and environmental conditions and water if necessary
	Soil removal	• Place topsoil & subsoil separately • Adhere to Soil Stockpile Guidelines for Resort Areas of KNP
	Soil replacement	• All excess soil gained from trail construction works is to be spread over the disturbed areas prior to rehabilitation • Ensure subsoil and topsoil are replaced in correct order
	Spread excess vegetation	• All excess native vegetation to be dispersed on exposed soil along the trail edge, placed on batters & embankments for erosion control or carefully spread further into bushland to avoid smothering of understory vegetation communities • Any excess thatch unable to be used for the above is to be stockpiled off-site for use on other rehabilitation projects with the resort
	Management of ephemeral springs crossing marked trail alignment	• Manage water from ephemeral springs with the installation of rock armouring and/or construction of rock stormwater pits and piping of water underneath trail • Drainage pipe to discharge into rock dispersion pits to reduce water velocity and erosion
Post Construction	Direct seeding	• Areas of open ski slope adjacent to the trail tread, or trail to be closed, and dominated by EXOTIC grasses, seed using a 1:1 mix of Chewings fescue & *Poa fawcettiae* • Areas of open ski slope adjacent to the trail tread, or trail to be closed, and dominated by NATIVE species, use only 100% native *Poa* endemic to the area • Seeding rate: Slope grade <40% use 15-20g/m^2 Slope grade >40% use 20-30g/m^2 • Broadcast Dynamic Lifter @ 100g/m^2 • Weed free rice straw mulch and jute mesh to be applied over seed to protect soil and provide a favourable environment for establishment
	Sod replacement	• Utilise sod replacement in disturbed areas where possible particularly in areas of native vegetation in accordance with “Rehabilitation Guidelines for the Resort Areas of KNP” – Section C.1.4
	Stabilise disturbed areas (batters/embankments and trail to be closed)	• Spread weed free rice straw on slope grades <40% @ 1 bale per 25m^2 and weigh down using native thatch / litter gained from works. Jute mesh may be used if thatch amount insufficient • Install Jute mesh (or similar) over straw on batters & embankments >500mm height & with a slope >40% (Grade% = Rise/Run x 100)

		• Direct seed at rates listed above to stabilise disturbed areas including batters & embankments
	Planting native tube stock	• Plant tube stock on batters & embankments in areas of native vegetation • Plant shrubs at 3/m^2 • Plant grasses and forbs at 5/m^2 • Refer to Appendix 2 for suitable rehabilitation species • Water crystals & organic fertiliser may be used at label rates • *Water crystals:* 5gm pre-hydrated crystals, crystals must be hydrated for at least 2hrs prior to planting • *Fertiliser:* 1 x Typhoon Native fertiliser tablet per plant (*Poa* & shrubs) placed next to or below roots
	Watering	• If required, water rehabilitation areas to assist in seed germination, tubestock establishment and straw retention
	Weed control	• Monitor all areas disturbed by the works (including areas adjacent to the works) for signs of weed infestation • Treat weeds with methods appropriate to weed species being treated including low pressure spot spraying and hand removal techniques • Limit off-target damage by only spraying in the appropriate conditions • Weed monitoring & control is to be conducted on an on-going basis and included in annual resort weed control activities

2.3 Trail Hardening

Trail hardening during and post construction will assist in reducing surface loss from the trail tread which in turn will reduce issues such as breaking bumps, exposed roots and sub-surface rock, water channelling and undercutting and sedimentation of drains, sumps and vegetation.

Trail hardening methods will include:

- Trail grading and compaction using excavator, manual hand tools and vibrating plate;
- Watering of trail tread to aid in compaction;
- Use of rock armouring and aggregate where required;
- Trail not to be used by the general public for a minimum of 30 days following completion;
- Approved KT staff to “ride-in” trail in a steady and controlled manner to aid compaction in the preferred ride line (ride-in staff to be approved at the Mountain Managers discretion).

2.4 Monitoring

Weekly inspections of the construction area will be carried out by the Environmental Officer during the construction phase as per the Site Environmental Management Plan (SEMP). These inspections are to ensure that all site environmental management measures are in place and in good working order. On-going monitoring will occur as per the Rehabilitation & Monitoring schedule.

2.5 Schedule

The initial rehabilitation and stabilisation works are to be carried out as a component of the construction works during the trail finishing and closed trail rehabilitation phase. The maintenance works associated with the rehabilitation areas are to be undertaken on an on-going, as required basis throughout each summer season. The schedule for the rehabilitation works is provided in the table below. The appointed Environmental Officer for the project is responsible for ensuring that all preparation, works, monitoring and reporting are carried out to the required standard. The works will be carried out by KT staff or an appointed contractor.

Rehabilitation and monitoring schedule

AREA	PROCEDURE	TIMING
Trail verge Berms Batters Embankments Closed Trail sections	Site Preparation	During construction
	Seeding and planting tube stock	During construction and ongoing annually until adequate groundcover has been achieved
	Mulching	During construction and ongoing annually until adequate groundcover has been achieved
	Maintenance (incl. weed control & replacement planting)	Ongoing annually as required (between November and May)
	Monitoring	**Weekly** during construction as per SEMP **Monthly** post construction for the first 12 months to monitor for erosion, sediment control and plant establishment **Annually** once stabilisation has been achieved, between November & May each year up until the date 5 years after the issue of a final occupation certificate. At the completion of the 5 years general monitoring & maintenance will continue. **Monitoring** will be conducted by way of site inspection with triggers for action detailed in Section 2.7 - Maintenance & Mitigation

2.6 Maintenance & Mitigation

In the event that monitoring indicates initial rehabilitation efforts are not effective (minimal grass / shrub establishment, establishment of weed species or declining coverage), additional management actions may be required. Management actions will be determined following 3 consecutive months of poor establishment or declining survival rates of native species planted. If deemed necessary, this period will be brought forward to implement the additional actions required. The management actions are to consist of one or more of the following:

Area	Maintenance trigger	Action
All areas disturbed by construction works	Poor grass & shrub establishment <75% native species coverage	• Additional direct seeding in areas of open non-native vegetation • In-fill planting of native tube stock • Grazing control by use of tree guards where appropriate
	Presence of weeds	• Weeds to be controlled annually include, but not limited to, Milfoil, St John's Wort, thistle & Juncus • Spot spray using low pressure sprayer • Use of hand removal techniques where appropriate
	Identification of erosion & unstable areas	• Installation of Jute mesh, brush matting & mulching • Installation of hay bale and sediment fencing control measures • Maintenance of sediment retention pits, water bars and drains • Carry out additional planting & re-vegetation works as per Rehabilitation table
	Presence of sediment & debris	• Remove build-up of sediment from sediment retention pits and pipe inlets & outlets as required • Removal of any excess sediment from vegetation adjacent to the trail
Drains Water bars Sediment retention pits	Presence of sediment & debris Identification of damage	• Inspection of drains, water bars & sediment retention pits particularly after heavy rainfall • Removal of sediment and debris to prevent blockages / overflow and limit sedimentation of vegetation • Regular inspection to identify damage to system and maintenance

Additional planting & re-vegetation works are to be carried out as per the Rehabilitation table. If it is found that after 12 months of monitoring the rehabilitation efforts are not effective, KT will liaise with NPWS to determine the most appropriate action. The 12-month period will allow time for the rehabilitation area to establish prior to any further intervention.

3 Exotic Species

All areas disturbed by the works are to be monitored on an ongoing basis for the occurrence of any exotic flora and evidence of exotic fauna (scats and tracks). In the event of the detection of exotic species, appropriate control works are to be scheduled as required as set out below.

Exotic flora

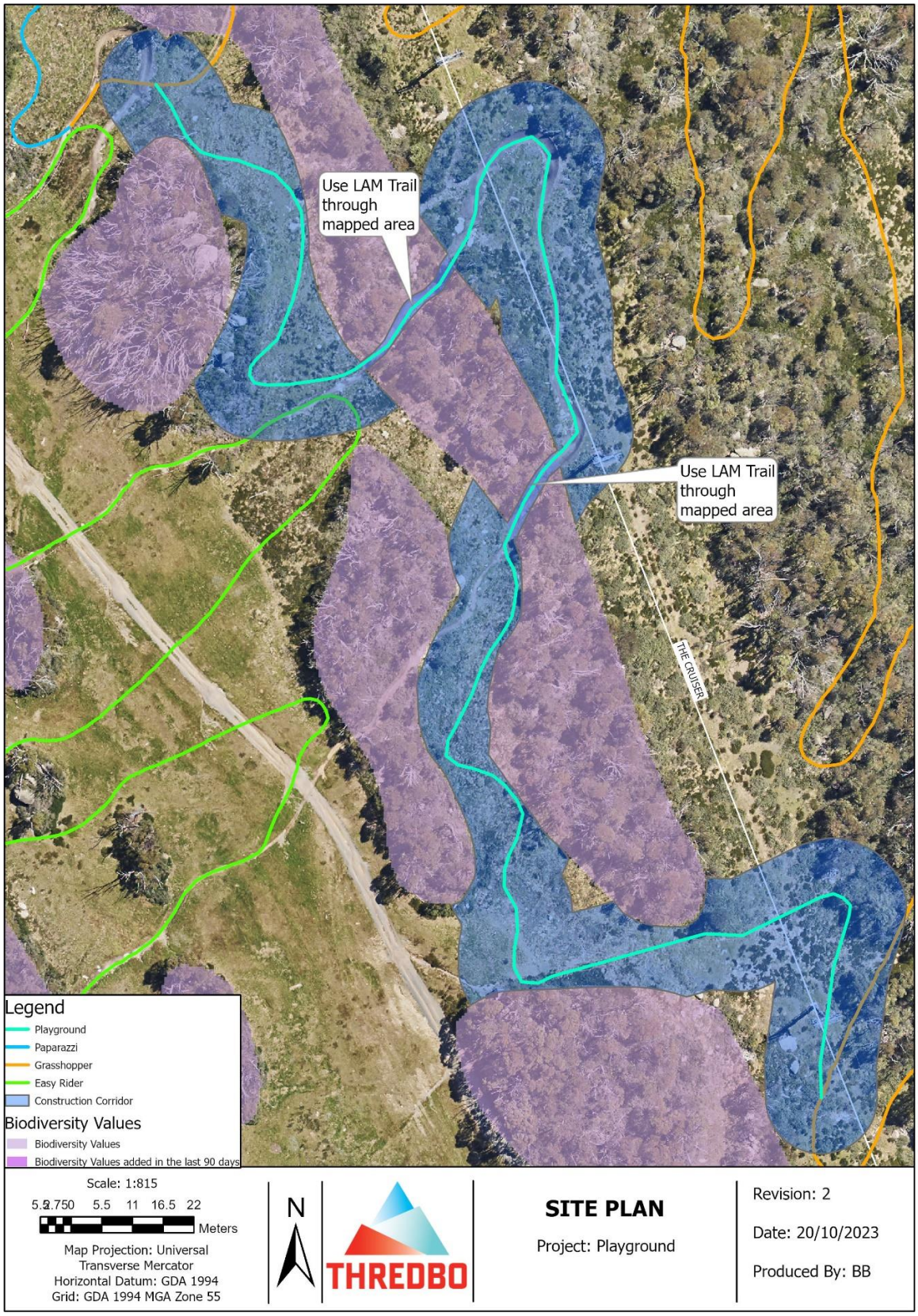
The control of exotic flora is to be undertaken using either spot spraying or hand removal techniques. The spraying activities are to be undertaken using appropriate herbicide for the species being treated and techniques for the conditions on the day. All control activities are to be undertaken prior to plant seed set.

Exotic fauna

The control of exotic fauna is to be undertaken in cooperation with NPWS as a resort wide program targeting the control of cats, foxes and rabbits. The cat and fox trapping program is undertaken by KT during the winter months in the village and on the lower slopes of the resort. Rabbit control programs are conducted in autumn and spring by KT staff also targeting these areas. Feral deer, cat, fox and dog control is undertaken by NPWS outside of the KT lease area.

4 Appendices

4.1 Appendix 1 – Development Area Map



4.2 Appendix 2 – Rehabilitation Species

The following species have been selected from the publication "Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park (NPWS 2007)" and also known to be present in the development area as per the Flora and Flora Assessment conducted by Ryan Smithers, Senior Ecologist, Eco Logical Australia. The table represents some of the recommended species for revegetation activities within Thredbo Resort at the development site altitude.

Rehabilitation Species – Thredbo Cruiser Area (1620m – 1870m)

Form	Species	Common Name
Forbs		
	Acaena novae-zelandia	Bidgee-widgee
	Asperula gunnii	Mountain Woodruff
	Celmisia pugionformis	Dagger-leaf Celmisia
	Leptorhynchos squamatus	Scaly Buttons
	Microseris lanceolata	Native Dandelion
	Senecio gunnii	Gunn's Groundsel
	Stellaria pungens	Starwort
Grasses		
	Poa ensiformis	Puple-sheathed Tussock-grass
	Poa fawcettiae	Smooth-blue Snow-grass
Shrubs		
	Baeckea gunniana	Alpine Baeckea
	Bossiaea foliosa	Small Leaved Bossiaea
	Grevillea australis	Alpine Grevillea
	Hovea montana	Alpine Hovea
	Olearia phlogopappa	Dusty Daisy-bush
	Ozothamnus secundifloris	Cascade Everlasting
	Ozothamnus hookeri	Kerosene Bush
	Podocarpus lawrencei	Mountain Plum-pine
	Prostanthera cuneata	Alpine Mint-bush
	Tasmannia xerophila	Alpine Pepper
Trees		
	Eucalyptus pauciflora	Snow Gum