Statement of Environmental Effects

Lower Playground Mountain Bike Trail

Thredbo Alpine Resort
Kosciuszko National Park, NSW

December 2024

Document Control

Revision	Date	Status	Author	Approved by
A	20/11/2024	Draft	J.Best; C.Chalk	K.Delpit
0	19/12/2024	Final	J.Best; C.Chalk	K.Delpit

Project Number: 24032MO

Kosciuszko Thredbo Pty Ltd

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1 Introduction

This Statement of Environmental Effects (SEE) has been prepared to support the Development Application (DA) for the construction of the Lower Playground Mountain Bike Trail located within Thredbo Alpine Resort, New South Wales (NSW) (hereinafter referred to as the Development).

1.1 Application summary

Table 1: Application details

Details	
Applicant Name	Kosciuszko Thredbo Pty Ltd
Applicant Address	1 Friday Drive, Thredbo NSW 2625
ABN	ABN 95 000 139 015
Site address	2 Friday Drive, Thredbo NSW 2625
Land	Cruiser Ski Area, Thredbo Alpine Resort, Kosciuszko National Park (KNP)
Lot/Plan	876/DP1243112 (Thredbo Head Lease)
Consent Authority	Department of Planning, Housing and Infrastructure
Local Government Area (LGA)	Snowy Monaro Regional Council
Integrated Development	Not applicable
Development type	Recreation infrastructure (mountain bike trail)
Development summary	Vegetation clearing Construction of mountain bike trail Site rehabilitation

1.2 Supporting documentation

This application is supported by the documentation listed in **Table 2**.

Table 2: Supporting Documentation

Document	Title / Description	Author/ Prepared by	Date	Document Reference
Plan	Site Plan, Proposed Lower Playground MTB Trail	Kosciuszko Thredbo Pty Ltd, BB	25/11/2024	Rev B
Plan	Standard Signage Details	Kosciuszko Thredbo Pty Ltd	16/12/2022	Rev 1
Report	Flora and Fauna Assessment – Lower Playground MTB Trail Thredbo Alpine Resort	Eco Logical Australia	19/12/2024	Version 2
Report	Site Environmental Management Plan, Lower Playground Mountain Bike Trail	Kosciuszko Thredbo Pty Ltd	20/11/2024	Rev 0
Report	Lower Playground, Detailed Rehabilitation and Monitoring Plan	Kosciuszko Thredbo Pty Ltd	19/12/2024	Rev 0

2 Site Context

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 LGA (**Figure 1**).

2.2 Local context

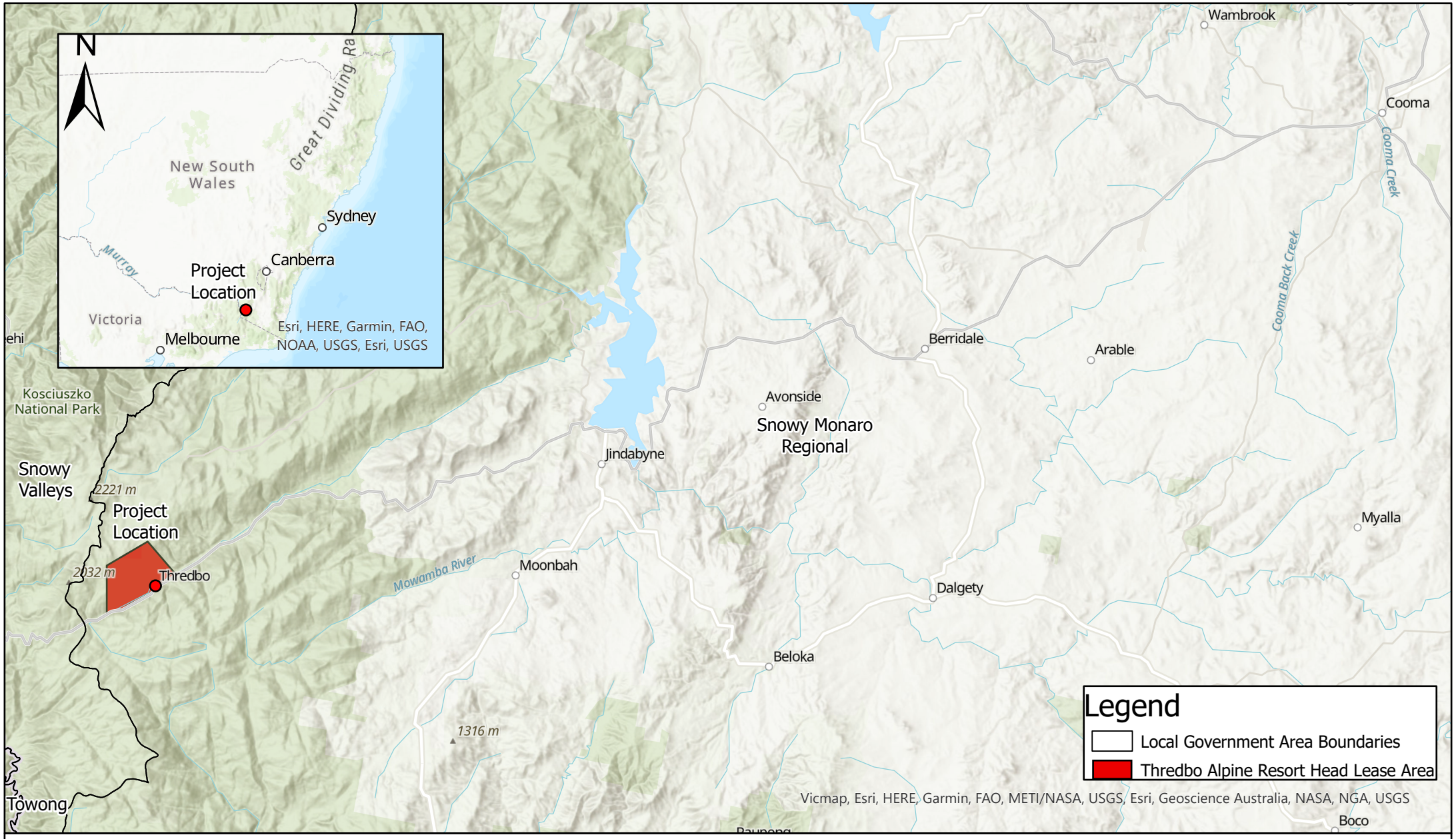
The Development site is located within the Cruiser ski area adjacent to/below the Cruiser chairlift, below the Playground ski run (refer **Figure 2**). Easy Rider, Paparazzi and Grasshopper MTB trails are located within close proximity of the site. The trail will utilise a section of the Grasshopper trail (subject to separate modified development approval). The site is within the Thredbo Head Lease Area on Lot 876 DP1243112.

2.3 Present and previous land uses

The Development is located within a predominately disturbed site comprising ski runs and access tracks, 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.

2.4 Site suitability

The contours and natural features within the locality provide suitable terrain for an intermediate trail. The site was chosen as it utilises access from existing trails in the area and minimises native vegetation disturbance as the alignment is predominately located within the disturbed ski slope. The alignment has been designed to retain mature trees.



Scale: 1:305,832

3 1.5 0 3 6 9 12

Kilometers

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

N

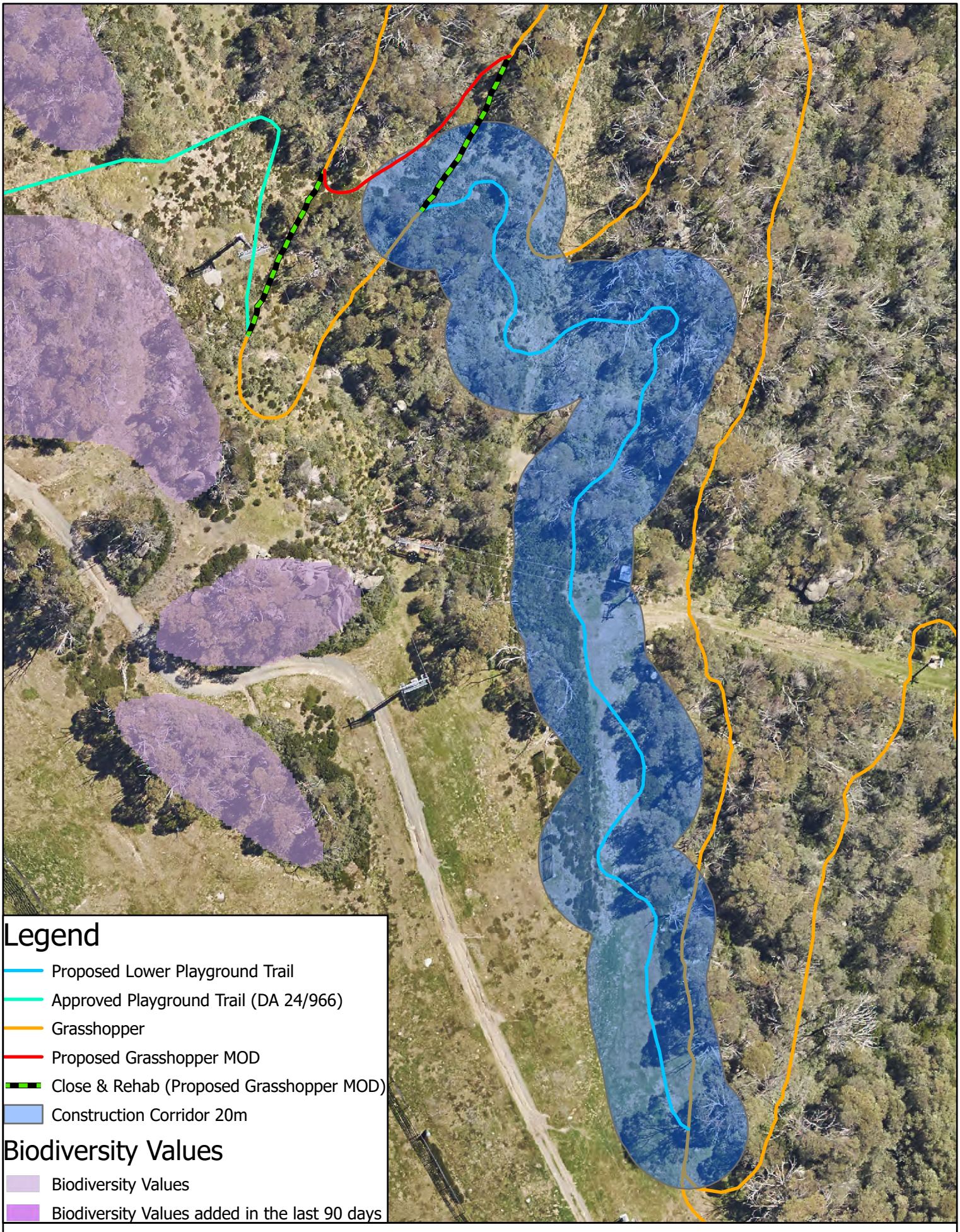
THREDBO

FIGURE 1: REGIONAL SITE CONTEXT

Revision: A

Date: 7/06/2022

Produced By: KO



Scale: 1:800

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: Proposed Lower Playground MTB Trail

Revision: B

Date: 25/11/2024

Produced By: BB

3 Project Description

3.1 Background

Thredbo's future trail construction is focused on improving trail sustainability, maintenance and rideability for existing trails while also designing new trails that promote these initiatives. This will be achieved by:

- Focusing on interconnecting the existing trail network by incorporating trails with nodes;
- Trying to avoid and move trails that cross open ski runs where possible; and
- Designing trails to avoid the requirement for knock down/rebuild where possible.

Creating interconnecting trails or "nodes" on our existing network is beneficial in many ways, including:

- Better riding experience
    - Creating more lines for riders to use increases the enjoyment for the rider and gives
    - KT the ability to have different skill level and trail styles on different nodes of the same trail.
    - Reduces the amount of traffic on busy sections of trail.
- Increases sustainability of the trail network and allows for more effective trail maintenance
    - With the growth of mountain biking as a sport KT have seen increased visitation to Thredbo in summer meaning the volume of traffic on our existing trail network is causing our trails to become worn out more quickly, and consequently in need of maintenance more often. By creating nodes we have the ability to close busy sections for extended periods of time to complete necessary repairs and maintenance.
    - Nodes allow us a safe way to maintain our trails more efficiently and effectively in turn increasing the sustainability of the trail. This is particularly important in steep areas where braking ruts become common, high traffic areas and areas that are difficult to access.
- Increases efficiency of emergency response
    - Interconnecting trails gives emergency response / patrollers the ability to close sections of trail and divert riders to other nodes when required. This in turn, allows for safer and more effective extraction of injured riders.

3.2 Purpose of development

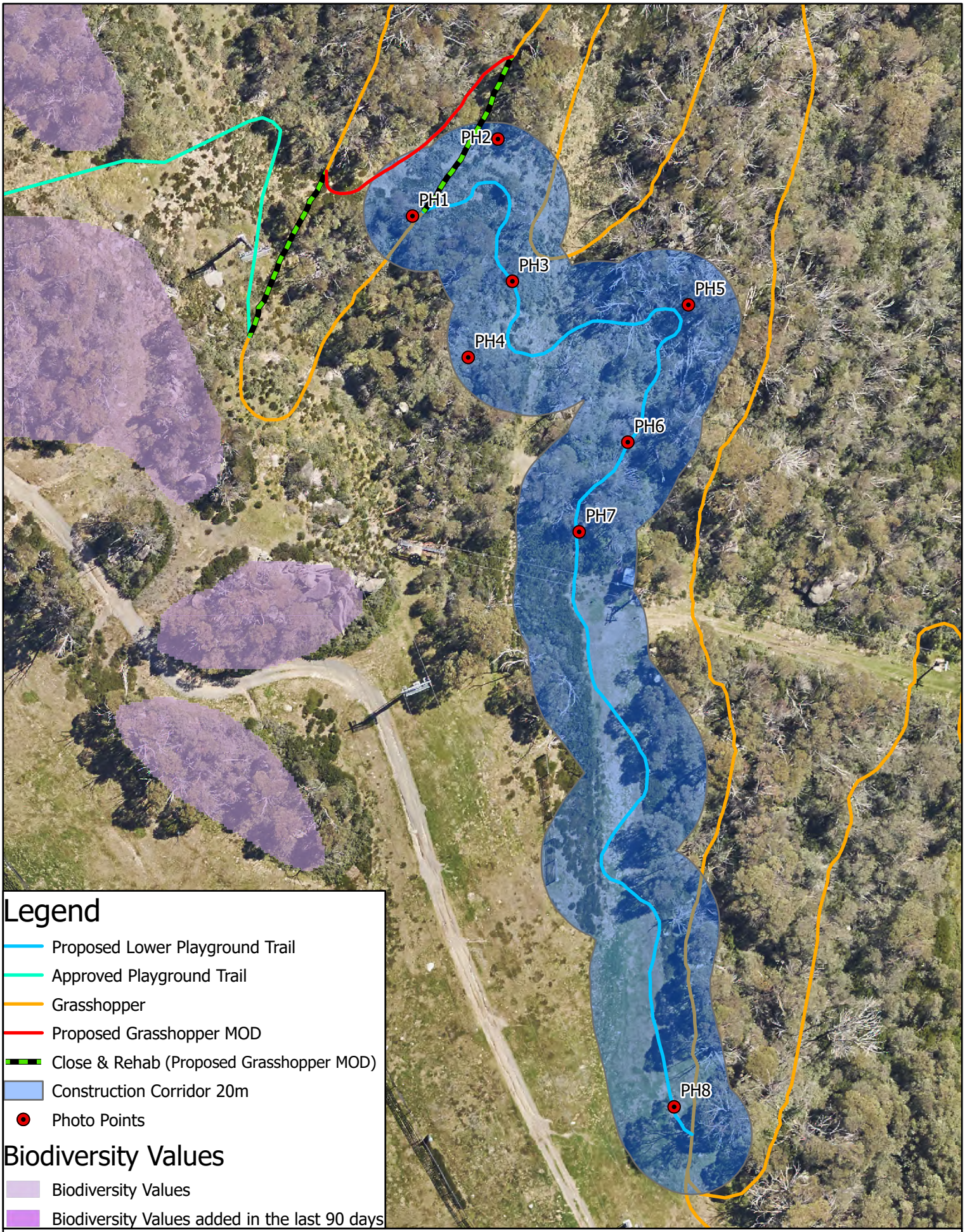
The purpose of the Development is to create a better riding experience in the Cruiser area by creating a new line to complement the Grasshopper and Playground trails in the locality. The trail will also provide an alternative node for intermediate riders to use when adjacent trails are closed for maintenance.

3.3 Development overview

The trail will be flow style, utilising the natural land formation and trail features such as berms, rollers and jumps to create in interesting line for riders. The Development will include:

- vegetation clearing
- construction of the trail
- site rehabilitation.

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



Legend

- Proposed Lower Playground Trail
- Approved Playground Trail
- Grasshopper
- Proposed Grasshopper MOD
- Close & Rehab (Proposed Grasshopper MOD)
- Construction Corridor 20m
- Photo Points

Biodiversity Values

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

Scale: 1:800

0 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

PHOTO POINTS

Project: Proposed Lower Playground MTB Trail

Revision: A

Date: 22/11/2024

Produced By: BB

Table 3: Trail Description and Site Photos

Photo Point ID / Description	Photo
PH1: The trail head commences off the existing Grasshopper trail	
PH2: The trail utilises the open areas of the disturbed ski slope.	
PH3: The trail continues through the open ski slope.	

Photo Point ID / Description	Photo
PH4: The trail continues into a bermed corner, then heads east within the open ski slope.	
PH5: The trail heads into another bermed corner before heading in a southerly direction toward the Easy Rider T-bar.	
PH6: The trail follows the contours towards the Easy Rider T-bar top station.	

Photo Point ID / Description	Photo
PH7: The trail exits the native vegetation uphill of the Easy Rider T-bar top station and traverses the disturbed ski slope.	
PH8: The trail terminates when it joins onto the Grasshopper trail.	

3.4 Trail design and construction techniques

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.

On 19 November 2024, representatives from the Department of Planning, House and Infrastructure (DPHI) and National Parks and Wildlife Service (NPWS) were provided the opportunity to walk the alignment and provide feedback on the proposal.

3.5 MTB trail design and construction techniques

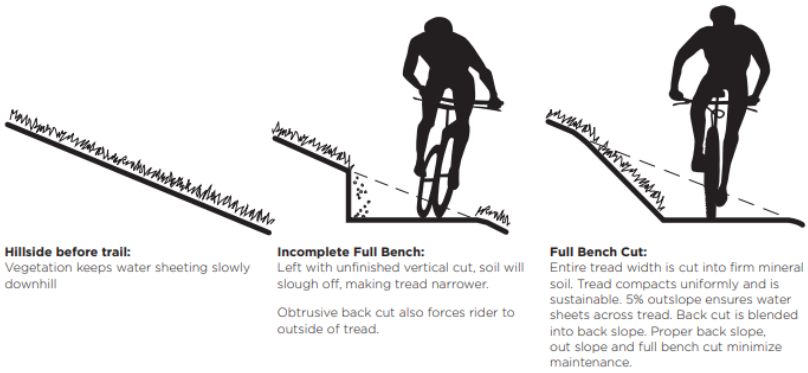
The MTB trail design and construction techniques have been developed with consideration of the following:

- International Mountain Bicycling Associated (IMBA) Guidelines
- Guidelines for trail planning, design and management: a toolkit for state and local government agencies, community groups and investors on how to plan, manage and market exceptional trail experiences (TRC Tourism 2015)
- Australian Mountain Bike Trail Guidelines (AusCycling 2019)
- Design principles applied to the construction of existing trails within the resort, including: trails for everyone, recreation versus competition, one-way trails, trail difficulty ratings, trail names and minimise environmental impacts.

A summary of the key trail design and construction techniques are provided in **Table 4**.

Table 4: Trail design and construction techniques

Element	Details
Trail length	Approx. 231 m
Trail difficulty rating	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 900-1200 mm.
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. The average trail corridor width is 2.5-3 m. *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.
Trail grade	The climbs and descents will be mostly moderate gradients in accordance with IMBA Guidelines.
Trail signage	Trail signage is installed to clearly mark the trail, inform users of their responsibilities, aid in navigation and provide key information. Coordinated directional signage will be installed at relevant locations to direct riders from key public areas to the trail head. Generally, trail signage includes: *Decision point signs* Decision point signs generally comprise posts with information in relation to important departure and destination locations along the trail. Signs are generally 400 x 200 mm, on a 500 mm round post, 1,800 mm high. The signs generally include the following information:

Element	Details
	• trail name • arrow indicating direction of trail • trail number (reference to trail network map) • difficulty symbol e.g. blue for intermediate • trail type e.g. flow • trail user type e.g. bikes only, no walkers, adaptive bikes • trail network logo.  *Example of decision point sign* A standard signage plan has been provided separately with this application.
Follow the contours	The trail should be built on a side slope, aligned along the contours of the hillside. The most sustainable trails are those that have a low overall grade (<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 tread involves using some of the excavated soil to construct the downhill side of the tread. This technique is prone to slipping and is not recommended, except in specific circumstances in which it must be supported by a retaining wall. Full bench tread involves excavating down and into the hillside and puts the entire tread width on mineral soil, thereby maximising stability and minimising ongoing maintenance.  *Example of benching (Source: IMBA 2001)*
Outslope	A method of tread construction that leaves the outside edge of a hillside trail lower than the inside, in order to shed water in sheet flow. 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.

Element	Details
	 *Example of outsloping on trail*
Rock 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.  *Example of rock armouring*
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).
Drainage crossings	Drainage crossings are a critical element of trail design and construction in areas which may have the greatest impact on water quality and the site where water has the greatest potential to damage the trail. Where minor drainage crossings are required, low level platforms will be constructed, similar to the structures used on the All-Mountain Trail as well as the TVT, which have been constructed from steel frames with fibre-glass mesh on top. Drainage crossings will be low profile and located close to the ground, and therefore handrails are unlikely required. However, if handrails are required, the steel posts will be pile driven (to refusal) for each section of the fibreglass mesh tread and bearers be installed with the fibreglass mesh on top.

Element	Details
	 *Example of drainage*
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).  *Example of half rule*
10 % rule – average trail grade guideline	Generally, an average trail grade of 10 % or less is the most sustainable (IMBA 2012).
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.
Grade 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

Element	Details
	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).  *Example of grade reversals*
Berms	A bermed corner has a banked outer edge that runs the entire length of the corner, allowing the rider to maintain a faster speed. Berms improve trail flow and reduce soil movement on corners. Berms help riders maintain speed without sliding out of the turn. Berms in conjunction with effective grade reversals provide effective drainage outlets.  *Example of Berm*

3.6 Operational details

The trail is proposed to open in 2025/26 mountain biking season.

4 Legislation and Statutory Framework

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

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

MNES that may occur, or relate to the search area (within a 5 km buffer) are provided in the EPBC Act Protected Matters Report (**Appendix A**). An assessment of EPBC Act considerations and potential impacts is provided in **Table** 5.

Table 5: EPBC Act considerations

EPBC Act Considerations	Comment
MNES – World Heritage Properties	Not applicable
MNES – National Heritage Places	No impact on the Australian Alps National Parks and Reserves
MNES – Wetlands of International Importance	No impact
MNES – Great Barrier Reef Marine Park	Not applicable
MNES – Commonwealth Marine Area	Not applicable
MNES – Listed Threatened Ecological Communities	No impact
MNES – Listed Threatened Species	No impact
MNES – Listed Migratory Species	No impact
Commonwealth Land	No impact

An EPBC Act referral to the Commonwealth Environment Minister is not recommended as the Development is unlikely to have a significant impact on any MNES or Commonwealth land.

4.2 State legislation

4.2.1 Environmental Planning and Assessment Act 1979

Section 4.15 of the Environmental Planning and Assessment Act 1979 (EP&A Act) outlines matters that the consent authority is to take into consideration when determining a DA. A review of the Development against these provisions is provided in **Table** 6.

Table 6: EP&A Act, Section 4.15 (1) Matters for consideration

EP&A Act, Section 4.15 – matters for consideration	Comment
(a) (i) any environmental planning instrument	The Precincts – Regional SEPP is the only environmental planning instrument which applies to the site for this proposal. Refer to assessment in the next section.
(ii) any proposed instrument	Not applicable. There are no draft Environmental Planning Instruments that are applicable to the Development.
(iii) any development control plan	Not applicable. There are currently no development control plans applicable to the site.
(iiia) any planning agreement	Not applicable. There are no planning agreements applicable to Thredbo under the Precincts – Regional SEPP.

EP&A Act, Section 4.15 – matters for consideration	Comment
(iv) the regulations	The DA and supporting information has been prepared in accordance with the relevant requirements of the EP&A Regulation.
(b) the likely impacts of that development	The likely impacts of the Development on the natural and built environment, and social and economic impacts in the locality have been assessed in this document.
(c) the suitability of the site for the development	There are no known records of contamination within the site. The site is considered suitable for the Development as it is predominantly disturbed, and the proposal is consistent with the surrounding land uses.
(d) any submissions made in accordance with this Act or the regulations	Consideration will be given to submissions made.
(e) the public interest	The Development is consistent with the aim and objectives of Chapter 4 of the Precincts - Regional SEPP, including the objective to encourage the carrying out a suitable range of development in the resort areas to support sustainable tourism in the Alpine Region. The Development will provide a better riding experience therefore contributing to summer tourism. The Development is considered to be within the public interest.

4.2.2 Biodiversity Conservation Act 2016

The purpose of the *Biodiversity Conservation Act 2016* (BC Act) is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ESD. The *Biodiversity Conservation Regulation 2017* (BC Regulation) sets out threshold levels for when the BOS will be triggered, refer **Table** 7.

Table 7: BC Regulation BOS triggers

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

4.2.3 State Environmental Planning Policy (Precincts – Regional) 2021

Development in the NSW alpine resort areas are subject to the provisions in Chapter 4 of the *Statement Environmental Planning Policy (Precincts -Regional) 2021* (Precincts – Regional SEPP). Consideration of the relevant provisions to the Development is provided in **Table** 8.

Table 8: Precincts – Regional SEPP, Chapter 4 considerations

Precinct- Regional SEPP, Chapter 4 Considerations	Comment
Section 4.2 Land to which Chapter applies	Thredbo Alpine Resort is listed as one of the Alpine Subregions on the *State Environmental Planning Policy (Precincts – Regional 2021 Thredbo Alpine Resort Map* referenced in Section 4.2.
Section 4.7 Land Use Table	The Development is 'recreational infrastructure' which is a permissible use in the Land Use table, and therefore permitted development in Thredbo.
Section 4.9 Demolition	Not applicable.
Section 4.10 Temporary use of land	Not applicable.
Section 4.21 Heritage Conservation	The Development is unlikely to impact upon any heritage items or Aboriginal heritage items or places.
Section 4.24 Flood planning	The site is not located in a flood planning area and is not subject to flooding.
Section 4.25 Earthworks (3) In deciding whether to grant development consent for earthworks, or for development involving ancillary earthworks, the consent authority must consider the following matters— (a) the likely disruption of, or adverse impact on, drainage patterns and soil stability in the locality of the development, (b) the effect of the development on the likely future use or redevelopment of the land, (c) the quality of the fill or the soil to be excavated, or both, (d) the effect of the development on the existing and likely amenity of adjoining properties, (e) the source of any fill material and the destination of any excavated material, (f) the likelihood of disturbing relics, (g) the proximity to, and potential for adverse impacts on, a waterway, drinking water catchment or environmentally sensitive area, (h) appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.	a) The earthworks are unlikely to cause the disruption to, or adversely impact on, drainage patterns or soil stability in the locality. Appropriate erosion and sediment controls will be implemented in accordance with trail building guidelines and the Site Environmental Management Plan – Lower Playground Mountain Bike Trail (KT 2024) (SEMP) during construction. b) The Development will not 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 Development is consistent with adjacent land uses. There are no adjoining properties. 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. f) Unlikely, refer **Section 5.7**. g) Impacts unlikely, refer to **Section 5**. h) Appropriate measures have been incorporated into the design and construction methods to avoid, minimise and mitigate the impacts of the Development.
Section 4.26 Master plans	The Snowy SAP Master Plan is applicable to the site.

Precinct- Regional SEPP, Chapter 4 Considerations	Comment
Section 4.28 Consideration of master plans and other documents (a) the aim and objectives of this Chapter set out in section 4.1, (d) the Geotechnical Policy —Kosciuszko Alpine Resorts published by the Department in November 2003, (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 objectives of Section 4.1, as demonstrated in this report.
Section 4.29 Consideration of environmental, geotechnical and other matters (a) measures proposed to address geotechnical issues relating to the development, (b) the extent to which the development will achieve an appropriate balance between— (i) the conservation of the natural environment, and (ii) taking measures to mitigate environmental hazards, including geotechnical hazards, bush fires and flooding, (c) the visual impact of the proposed development, particularly when viewed from the land identified as the Main Range Management Unit in the Kosciuszko National Park Plan of Management, (d) the cumulative impacts of development and resource use on the environment of the Alpine Subregion in which the development is carried out, (e) the capacity of existing infrastructure and services for transport to and within the Alpine Region to deal with additional usage generated by the development, including in peak periods, (f) the capacity of existing waste or resource management facilities to deal with additional waste generated by the development, including in peak periods. (2) For development involving earthworks or stormwater draining works, the consent authority must also consider measures to mitigate adverse impacts associated with the works. (3) For development the consent authority considers will significantly alter the character of an Alpine Subregion, the consent authority must also consider— (a) the existing character of the site and immediate surroundings, and (b) how the development will relate to the Alpine Subregion.	a) Refer **Section 5.1**. b) The Development does not require any measures to mitigate environmental hazards that would impact on the conservation of the natural environment. c) The Development is not visible from the Main Range Management Unit. Visual impacts considered acceptable within the context of the site and surrounds. d) The impacts of the Development are addressed in **Section 5**. With the implementation of appropriate environmental controls during construction and operation, the Development is not anticipated to result in any significant impacts on the existing environment. e) The Development will not impact upon the capacity of existing infrastructure and services for transport to deal with additional usage generated by the Development. f) The Development will not impact upon the capacity of existing waste or resource management facilities. (2) Earthworks are proposed. Temporary drainage, erosion and sediment control measures will be implemented during construction in accordance with the SEMP. Appropriate drainage will be incorporated during trail construction to manage surface water runoff and erosion during operation. (3) The Development will not alter the alpine resort character. The Development will contribute to sustainable year-round recreational opportunities.
Section 4.30 Kosciuszko National Park Plan of Management	The Development is not inconsistent with the relevant provisions of the Kosciuszko National Park Plan of Management.

4.2.4 Integrated development

Integrated development requires development consent and one or more of the approvals outlined in Section 4.46 of the EP&A Act. A review of the *Development referrals guideline* (DPIE 2021) has been undertaken to inform this Application. The Development is not integrated development requiring any of the approvals listed in **Table 9**.

Table 9: Integrated development considerations

Act	Trigger	Approval/Permit	Applicable (yes/no)
Water Management Act 2000	Works within waterfront land	Controlled Activity Approval	No
Rural Fires Act 1997	Bush Fire Prone Land; subdivision of land that could lawfully be used for residential or rural residential purposes or development of land for special fire protection purposes	Section 100B, Bush Fire Safety Authority	No
National Parks and Wildlife Act 1974	Harming an Aboriginal object or declared Aboriginal place	Aboriginal Heritage Impact Permit	No
Fisheries Management Act 1994	activities involving dredging and reclamation work; activities temporarily or permanently obstructing fish passage; using explosives and other dangerous substances; harming marine vegetation.	Part 7 Fisheries Management Act Permit	No

4.3 Plans

4.3.1 South East and Tablelands Regional Plan 2036

The *South East and Tablelands Regional Plan 2036* (Regional Plan) describes the vision, goals and actions that will deliver greater prosperity for those who live, work and visit the region. The Regional Plan promotes well planned, efficient and sustainable development that complements the area's natural and cultural values. In relation to the NSW Alpine Resorts, the Regional Plan seeks to promote year-round alpine tourism opportunities that will strengthen long-term resilience.

The Development is consistent with 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.

4.3.2 Snowy Mountains Special Activation Precinct Master Plan 2022

The Snowy Mountains Special Activation Precinct Master Plan 2022 (Snowy SAP Master Plan) applies to the NSW Alpine Resort Areas, including Thredbo.

The Development is consistent with the Master Plan as the trail has been designed to minimise environmental impacts and supports the continued summer visitation within Thredbo.

5 Impact Assessment

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

5.1 Geotechnical considerations

A review of the Geotechnical Policy Kosciuszko Alpine Resorts (DIPNR 2003) 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.

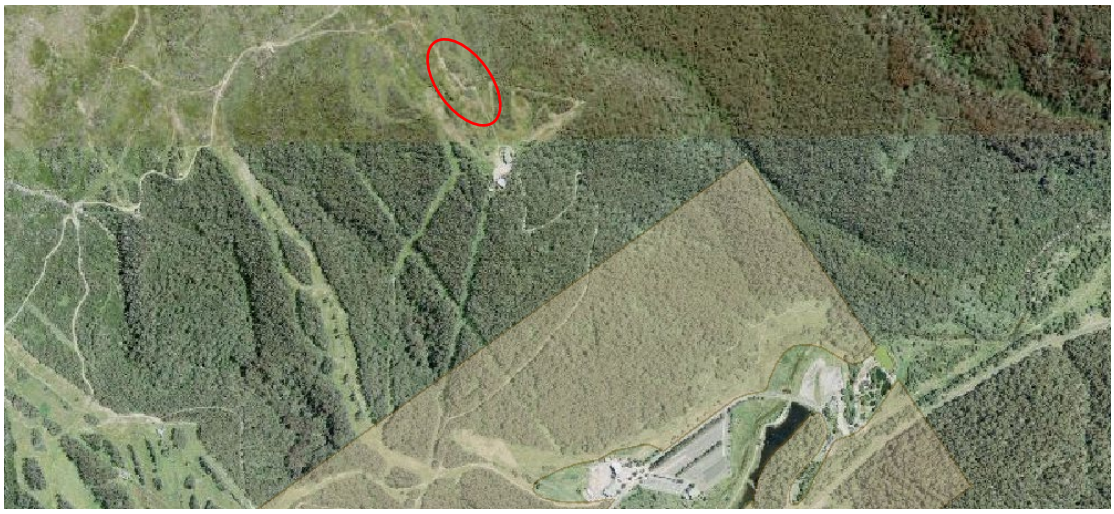


Figure 4: Geotechnical Policy, NSW Planning Portal Spatial Viewer (NSW Government 2024a)

5.2 Soil and water

A review of the *Water Management (General) Regulation 2018 Hydro Line spatial data* (NSW Government 2018) and the superseded *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. No further assessment is required under the *Water Management Act 2000*.

Figure 5: Waterfront land review (Source: NSW Government 2024d; NSW DoP 2006)

5.3 Biodiversity

Impacts to the biodiversity values of the site and surrounds have been assessed in the Flora and Fauna Assessment (ELA 2024) provided in **Appendix B**.

5.4 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 new trail will contribute to diversifying Thredbo's 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 support the continued summer visitation within Thredbo.

5.5 Visual impacts

The Development is for the construction of a MTB trail which consistent with the surrounding land uses in the locality. The trail will not alter the character of the resort as it will form part of the existing Thredbo MTB Trail Network. The tread of the trail is shaped using natural materials (rocks and soil) to provide features that blend within the existing landscape. Visual impacts are considered acceptable.

5.6 Heritage

The Development will not impact on any heritage items or places listed in Schedule 4 (Heritage Items – Chapter 4) of the Precincts – Regional SEPP.

5.7 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 in **Table 10**.

Table 10: Aboriginal cultural heritage due diligence assessment

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. No culturally modified trees were identified within the site.
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 30 October 2024. The search results (**Appendix A**) 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

As identified above, all reasonable steps have been undertaken to ensure the Development fulfils the requirements of the Aboriginal Cultural Heritage Due Diligence Process. Potential impacts from the Development on objects or sites of Aboriginal Cultural Heritage significance are considered unlikely. In the unlikely event that Aboriginal objects are discovered, management measures outlined in the SEMP will be implemented.

5.8 Noise

There are no sensitive receptors within the locality. Controls will be implemented during construction in accordance with the SEMP. No adverse noise impacts are proposed.

5.9 Air quality

There are no sensitive receptors within the locality. Controls will be implemented during construction in accordance with the SEMP. Potential impacts from airborne emissions (e.g. dust, machinery exhaust fumes) are considered unlikely.

5.10 Access and traffic

Construction site access is via the Merritts Summer Access Road. The construction will be undertaken outside of the operating mountain bike season, therefore no impacts to existing trails in the locality are anticipated.

5.11 Waste management

Storage and disposal of construction waste will be managed in accordance with the SEMP.

6 Conclusion

This application is seeking development approval for the construction of a MTB trail within Thredbo Alpine Resort. 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 subject site and surrounds. With the implementation of appropriate controls during construction and operation, the environmental impacts of the Development are considered acceptable.

The Development is considered within the public interest as it will provide a better riding experience for guests and support the continued summer visitation within Thredbo.

7 References

AusCycling 2019, Australian Mountain Bike Trail Guidelines.

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

DCCEEW 2024, *Protected Matters Search Tool*, Department of Agriculture, Water and the Environment, https://www.environment.gov.au/epbc/protected-matters-search-tool

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

Department of Planning (DoP) 2006, *State Environmental Planning Policy (Kosciuszko National Park – Alpine Resort) Thredbo Alpine Resort, Sheet 1 of 5*

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

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

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

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

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

Eco Logical Australia 2024, Flora and Fauna Assessment – Lower Playground MTB Trail Thredbo Alpine Resort.

Heritage NSW 2024, *AHIMS Web Services*, NSW Government, https://www.environment.nsw.gov.au/awssapp/

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

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

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

NSW Government 2024a, ePlanning Spatial Viewer, https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address

NSW Government 2024b, Biodiversity Values Map and Threshold Tool, https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap

NSW Government 2024c, NSW BioNet, https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet

NSW Government 2024d, *Water Management (General) Regulation 2018 Hydro Line spatial data*, https://www.industry.nsw.gov.au/water/licensing-trade/hydroline-spatial-data

8 Appendices

Appendix A Desktop Search Results

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Grasshopper MOD

Client Service ID : 945169

Kosciusko Thredbo

Date: 30 October 2024

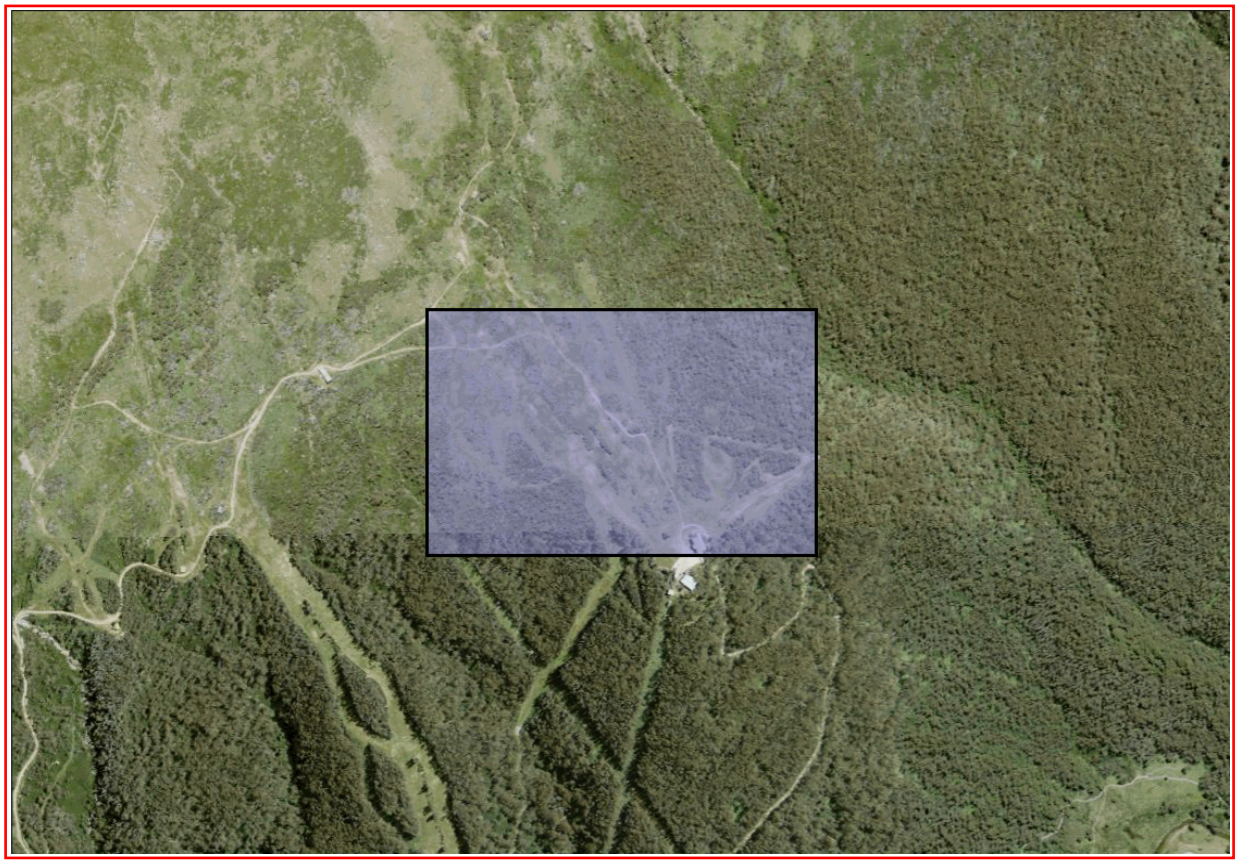
Attention: Jocelyn Best

Email: jocelyn_best@evt.com

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -36.4913, 148.3025 - Lat, Long To : -36.4873, 148.3102, conducted by Jocelyn Best on 30 October 2024.

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



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

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

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

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

Important information about your AHIMS search

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

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

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

EPBC Act Protected Matters Report

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

Report created: 20-Nov-2024

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	2
Wetlands of International Importance (Ramsar	8
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	46
Listed Migratory Species:	8

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:	4
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

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

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

Listed Threatened Ecological Communities			[Resource Information]

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

Community Name	Threatened Category	Presence Text	Buffer Status

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

Listed Threatened Species [Resource Information]

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

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

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

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

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
Eulamprus kosciuskoi Alpine Water Skink [59693]	Vulnerable	Species or species habitat known to occur within area	In feature area
Liopholis guthega Guthega Skink [83079]	Endangered	Species or species habitat known to occur within area	In feature area
Liopholis montana Mountain Skink [87162]	Endangered	Species or species habitat likely to occur within area	In feature area
Pseudemoia cryodroma Alpine Bog Skink, Alpine Bog-skink [84408]	Endangered	Species or species habitat known to occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area

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

Other Matters Protected by the EPBC Act

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat may occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
[Neophema chrysostoma](#) Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
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 is 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 on the contents of this report.

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 point locations and environmental data layers.

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 when time permits.

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 breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

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

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

Acknowledgements

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

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

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

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

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Appendix B Flora and Fauna Assessment

Flora and Fauna Assessment – Lower Playground MTB Trail Thredbo Alpine Resort

Kosciuszko Thredbo Pty Ltd

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Template 2.8.1

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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
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DCCEEW (NSW)	NSW Department of Climate Change, Energy, the Environment and Water
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	*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 Lower Playground mountain bike trail at Thredbo Alpine Resort.

The purpose of the Development is to create a better riding experience in the Cruiser area by creating a new line to complement the Grasshopper and Playground trails. The trail will also provide a node for intermediate riders to use when adjacent trails are closed for maintenance. The trail will be flow style, utilising the natural land formation and trail features such as berms, rollers and jumps to create in interesting line for riders.

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). 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 400 m^2 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 0.01%), 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, 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 purpose of the Development is to create a better riding experience in the Cruiser area by creating a new line to complement the Grasshopper and Playground trails. The trail will also provide a node for intermediate riders to use when adjacent trails are closed for maintenance. The trail will be flow style, utilising the natural land formation and trail features such as berms, rollers and jumps to create in interesting line for riders. The trail tread width will average 900-1200 mm. The trail corridor will average 2.5-3 m wide.

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 2.5-3 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 2024).

1.2 Direct and indirect impacts

Direct impacts on flora and fauna arising from the proposal will predominantly comprise the removal or further disturbance to approximately 400 m^2 of native vegetation (Subalpine Woodland and shrubland derived from the historic 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.

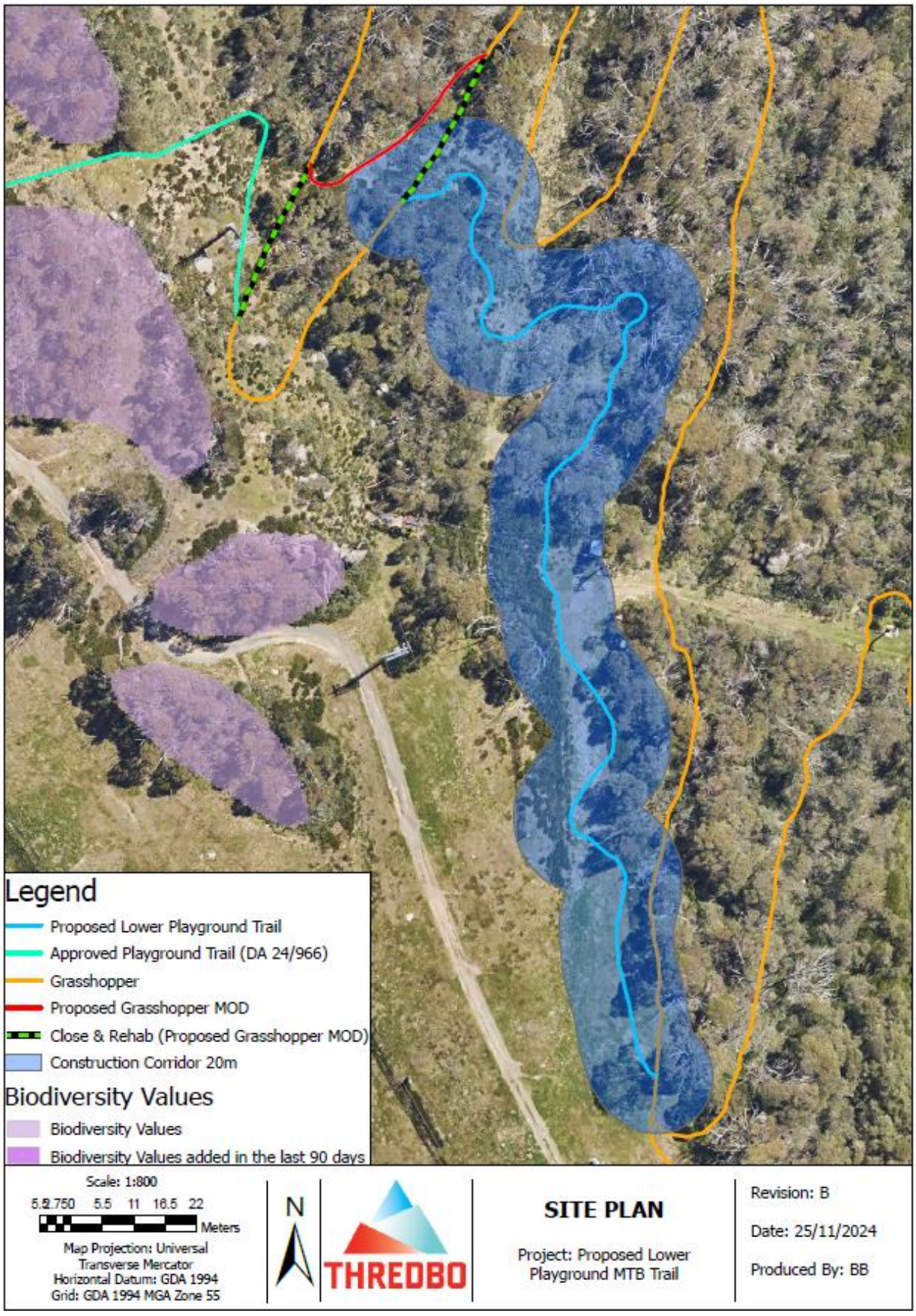

Figure 1: The proposal

Photo 1: The trail starts where it diverts from the existing Grasshopper Trail.

Photo 2: The trail will impact on Subalpine Woodland and require the removal of some saplings however all mature trees will be retained.

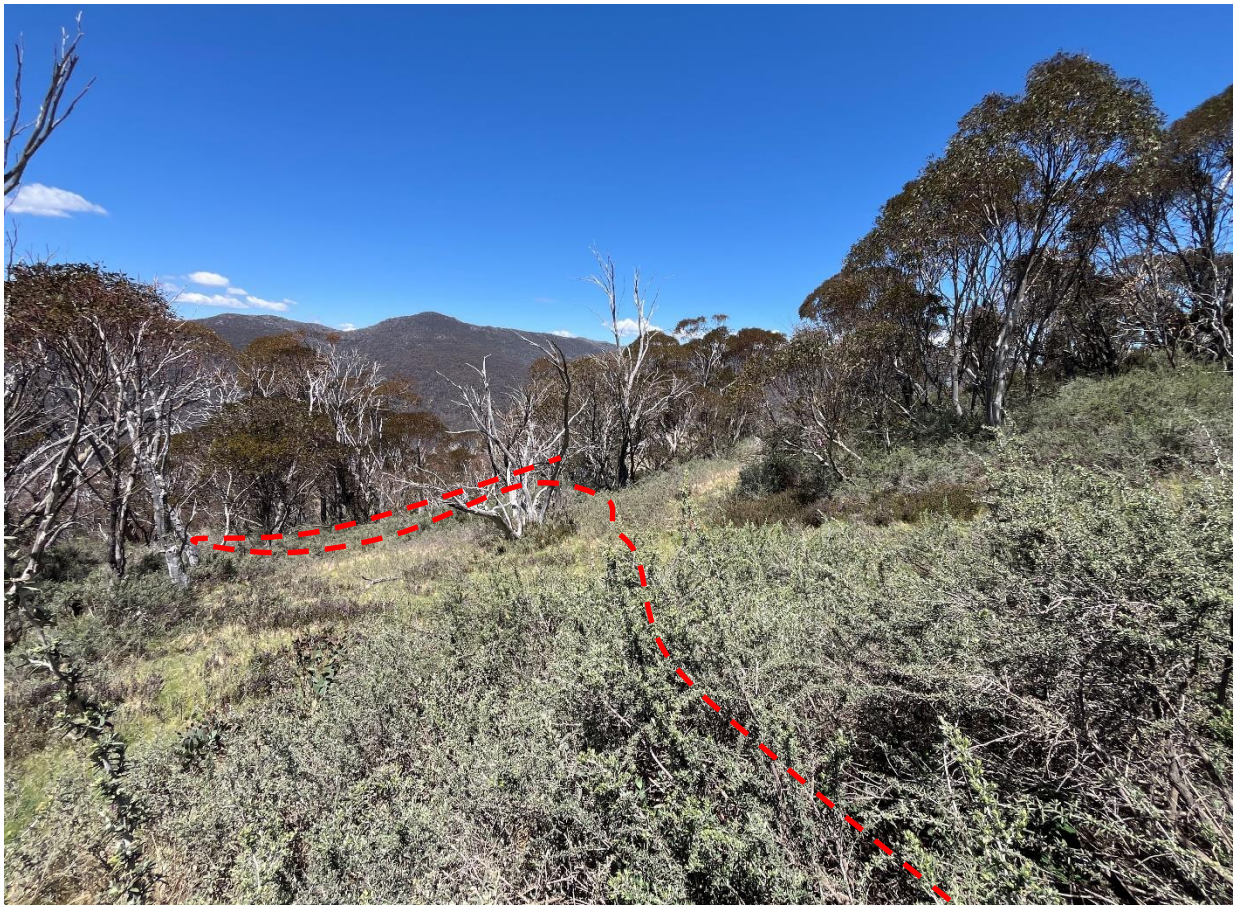

Photo 3: The trail will wind downslope through derived shrubland from the modification of the Subalpine Woodland for the purposes of creating a ski slope.

Photo 4: The proposed trail stays below and west of the existing Grasshopper trail.

Photo 5: The proposed trail then heads back towards the cleared areas at the top of the Easy Does It T-bar.

Photo 6: The trail continues to descend traversing the existing ski slope and offload area for the Easy Does It T-bar.

Photo 7: The trails has been designed to avoid any clearing of the Subalpine Woodland on the edges of the existing ski slope and offload area for the Easy Does It T-bar.

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.

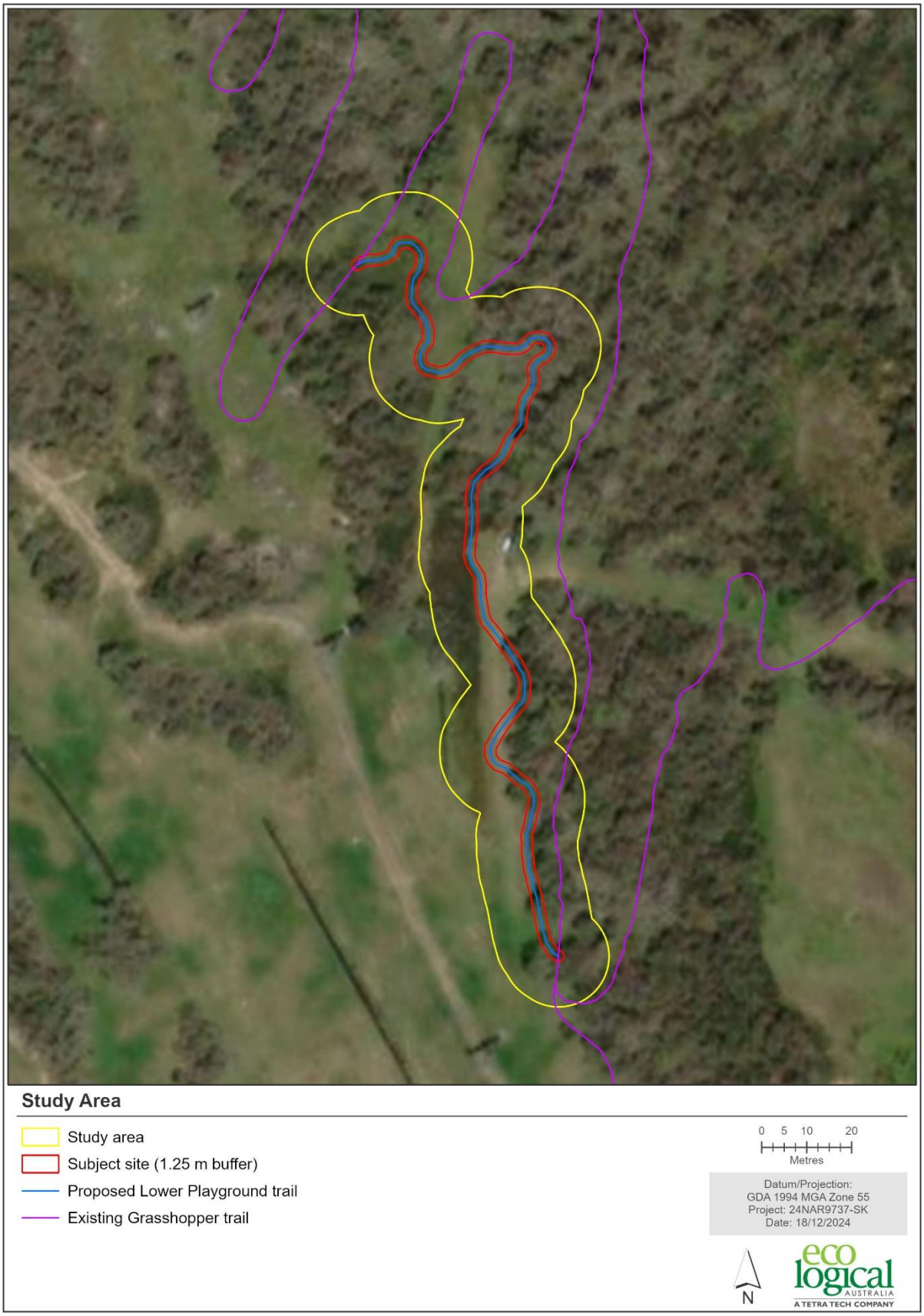

Figure 2: The subject site and study area.

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 2024). However, the legislation and planning instruments which are relevant to the assessment of potential impacts on terrestrial flora and fauna are discussed in brief below.

1.6.1 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 11 November 2024.

2.2.1 Flora surveys

A botanical survey was conducted in the study area by ELA Principal Ecologist Ryan Smithers on 11 November 2024.

2.2.1.1 Community identification and floristic audit

The study area was surveyed to document the flora species present, including those of conservation significance, and the location and extent of vegetation communities including any TECs encountered. 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 11 November 2024.

2.2.2.1 Habitat analysis

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

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

2.2.2.2 Diurnal surveys

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

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

2.2.2.3 Limitations

The results of fauna surveys can be optimised by conducting investigations over a long period to compensate for the effect of unfavourable weather, seasonal changes and climatic variation. In general, the longer the survey the more species will be detected. Results can also be improved by using a wide range of techniques, since some species are more likely to be detected by a particular method. However, surveys are subject to constraints that determine the amount of time allocated, the methods used and the timing of the work. Thus, the results should be viewed in the light of these limitations. The fauna detected during the survey period are a guide to the native fauna present, but are by no means a definitive list of the species occurring in the study area. Nevertheless, the techniques used in this investigation are considered adequate to 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 10 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), which is 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. 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 200 m^2 of Subalpine Woodland and 200 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 0.04 ha of Subalpine Woodland (< 0.01% 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, 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 0.04 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 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
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.

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 Lower 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 400 m^2 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, 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 species 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

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
Cercartetus nanus	Eastern Pygmy-possum		V	-	The Eastern Pygmy-possum is found in wet and dry eucalypt forest, subalpine woodland, coastal banksia woodland and wet heath. Pygmy-Possums feed mostly on the pollen and nectar from Banksias, Eucalypts and understorey plants and will also eat insects, seeds and fruit. The presence of Banksia sp. and Leptospermum sp. are an important habitat feature. Small tree hollows are favoured as day nesting sites, but nests have also been found under bark, in old bird nests and in the branch forks of tea-trees. The Eastern Pygmy-possum appears to be mainly solitary, each individual using several nests, with males having non-exclusive home-ranges of about 0.68 hectares and females about 0.35 hectares. They are mainly nocturnal. The Eastern Pygmy-possum is found in south-eastern Australia, from southern Queensland to eastern South Australia and in Tasmania. In NSW it extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes.	Potential
Dasyurus maculatus	Spotted-tailed Quoll		V	E	The species prefers moist forest types and is often associated with escarpments. There is no denning habitat for the species within the study are and the potential foraging habitat within the study area would form only a small proportion of the home range of the species, which has been estimated at between 800 ha and 2000 ha.	Unlikely
Mastacomys fuscus	Broad-toothed Rat		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

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

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

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
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 abundant nectar sources with different flowering times to provide a reliable supply of nectar. The species would not occur within the study area.	No
Artamus cyanopterus cyanopterus	Dusky Woodswallow		V	-	Dusky woodswallows are widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. They primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-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

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
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 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW. The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW.	No
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

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
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, migrating birds move gradually northwards up the west coast, through the Hunter Group and King Island in Bass Strait and on to the mainland. On the journey the birds usually feed on beach-front vegetation including salt tolerant species such as sea rocket (Cakile maritima). They also eat various coastal native and introduced grasses. There is no habitat for the species within the study area.	No
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

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
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 would likely use the more open habitats within the study area from time to time for foraging.	Known
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

Scientific name	Common name	FM Act	BC Act	EPBC Act	Habitat associations	Likelihood of occurrence
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
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)
- *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.

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 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 (0.04 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 (0.04 ha) for the Flame Robin, 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, 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 0.04 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, Alpine She-oak Skink and Broad-toothed Rat. The significant impact criteria for endangered species are discussed below: a. lead to a long-term decrease in the size a population of a species, 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

Matters to be addressed	Impact
	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. The proposed action will not remove any foraging habitat for the Gang-gang Cockatoo. The proposal will not affect any breeding or roosting habitat or otherwise adversely impact the species. Under these circumstances, the proposed action will not lead to a long-term decrease in the size of the Gang-gang Cockatoo population. Approximately 0.04 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 0.04 ha of native vegetation which is a small amount of habitat in the context of the extent of similar habitats in the locality generally. The proposed works will not affect any key habitat resources for the Gang-gang Cockatoo or Broad-toothed Rat; nor affect these species ability to access habitats within or beyond the study area. Under these circumstances, the proposed action is highly unlikely to reduce the area of occupancy of the local population of the Gang-gang Cockatoo or Broad-toothed Rat. The approximately 0.04 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 0.04 ha of native vegetation which is a small amount of habitat in the context of the extent of similar habitats in the locality generally. The proposed works will not affect any key habitat resources for the Gang-gang Cockatoo or Broad-toothed Rat; nor affect 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 or Broad-toothed Rat into two or more populations. The proposal involves disturbances to a narrow corridor up to 3 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

Matters to be addressed	Impact
	No habitat within the development site is considered likely to be critical to the survival of the Gang-gang Cockatoo or Broad-toothed Rat. There are thousands of hectares of similar habitats in the alpine and subalpine zones of the Australian alps, including elsewhere within the Thredbo Resort area. The Gang-gang Cockatoo and Broad-toothed Rat continue to occur within the Thredbo Resort Area despite a long history of similar and more extensive disturbances. 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 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. The proposed action and affected area is too small to disrupt the breeding cycle of a population of the Broad-toothed Rat which would be unlikely to breed within the study area given the generally dry nature of the habitats there. 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 and Broad-toothed Rat, 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 or Broad-toothed Rat 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, Broad-toothed Rat 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

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

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