STATEMENT OF ENVIRONMENTAL EFFECTS

THREDBO MOUNTAIN BIKE TRAILS
CRUISER GREEN MTB TRAIL, MERRITTS
THREDBO ALPINE RESORT
KOSCIUSZKO NATIONAL PARK

Prepared for:
Kosciuszko Thredbo Pty Ltd

SEPTEMBER 2021
Project: 20-21

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Dabyne Planning Pty Ltd

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1. INTRODUCTION

1.1 Executive Summary

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

The DA is for the Cruiser Green Trail, a 1.4km 'easy-intermediate' flow style mountain bike trail that commences at the top of the Cruiser Chairlift and descends the slope to connect into the All-Mountain Trail. Subject to separate development consent, the trail will also be able to connect into the proposed Cruiser Blue trail and the Upper N4 trail.

The trail will be generally located west of the Cruiser Chairlift within the upper to mid slopes of the Merritts ski area, within and adjacent to the Playground ski run.

By connecting into the All-Mountain Trail for a short section and then onto the proposed Upper N4 Trail and then constructed Lower N4 Trail, this provides riders an 'easy-intermediate' level of trail riding from the Cruiser Chairlift top station to the Merritts Gondola mid-station and ongoing connection to the Gunbarrel Chairlift/Friday Flat area (via the Friday Flat Loop trail) or the Valley Terminal precinct (via the All-Mountain and Home Run trails).

The proposed trail was not contemplated in the original Master Plan as the plan predated the inception of the Merritts Gondola. The Gondola allows for significantly improved access to the Merritts base area (and therefore Cruiser Chairlift as part of the Merritts Bike Park Zone) that did not exist at the time of the Master Plan.

The proposed trail however fits within the vision outlined in the Master Plan which identified for the provision of more beginner friendly trails and to target where there is an undersupply across the Southern hemisphere, being large-scale beginner-friendly mountain bike destinations and quality chair lift/shuttle-accessed descending trails.

This trail therefore forms another stage of mountain bike trails as part of the overall Master Plan for mountain biking at Thredbo Alpine Resort. This is part of the implementation of a world class mountain bike trail network across the Thredbo Alpine Resort with an ambition for Thredbo to become the country's most iconic mountain bike destination for recreational riders and events.

The proposed trail is intended to be an 'easy-intermediate' grade mountain bike descent, similar to the Lower N4 Trail in that it would offer a gently descending, non-technical trail. This trail is seen as a key component to growing the resort's visitation to include a much greater percentage of complementary market riders.

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

This included a joint inspection with both the DPIE and National Parks and Wildlife Service (NPWS) as part of the preliminary assessment process.

Following the preliminary analysis work, an extensive biodiversity assessment was then undertaken of the proposed trail alignment.

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

Although the proposed trail alignment has been designed to avoid sensitive native vegetation, some areas that are not sensitive have been mapped anyway as being located within biodiversity value areas and therefore the clearing of vegetation will trigger the Biodiversity Offsets Scheme (BOS) under the Biodiversity Conservation Act, 2016 (BC Act, 2016).

Consequently, a Biodiversity Development Assessment Report (BDAR) has been prepared by Ryan Smithers, Senior Ecologist with Eco Logical Australia and an Accredited Person. The BDAR outlines the measures taken to avoid, minimise and mitigate impacts to the vegetation and habitats present within the development site during the design, construction and operation of the development. The residual unavoidable impacts of the proposed development were calculated in accordance with the Biodiversity Assessment Method (BAM) by utilising the Biodiversity Assessment Method Credit Calculator (BAMC). The BAMC calculated that a total of four (4) ecosystem credits and three (3) species credits are required to offset the unavoidable impacts to the vegetation and habitat present within the development site.

Payment of the offset credits will be made to the Biodiversity Conservation Fund (BCF) prior to works commencing.

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

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

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

The purpose of this SEE is to:

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

The report has been prepared in accordance with the requirements of Schedule 1 of the Environmental Planning and Assessment Regulations 2000.

1.2 Background to the Proposal

KT has operated and promoted both recreational and competitive mountain biking at the resort since the early 1990's.

As part of promoting and developing mountain biking at the resort, KT has developed multiple mountain biking products by investing in kilometres of cross country single-track, the Thredbo Mountain-cross track (at Friday Flat) and the world-renowned downhill track, the Cannonball Downhill.

The iconic Cannonball Downhill, being one of Australia's longest downhill courses has been host to national and international competitions, including but not limited to the current Australian Mountain Bike Series, MTBA Gravity Cup, Australian Interschool's MTB Championships and Oceania MTB Championships.

In 2005, KT developed the Thredbo Mountain-cross track at Friday Flat, based on Glen Jacobs of World Trail design. The track has hosted numerous races since its opening including national rounds, state rounds and the National Interschools Mountain Biking Competition.

In 2007 the NSW Government commissioned the construction of the Thredbo Valley Track (TVT), a shared use trail for walking and bike riding between Thredbo Alpine Resort and Bullocks Flat, covering 17km. The construction of upper section of the TVT was completed in the 2013/2014 summer as shown on the extracted TVT trail map provided in figure 1 below.

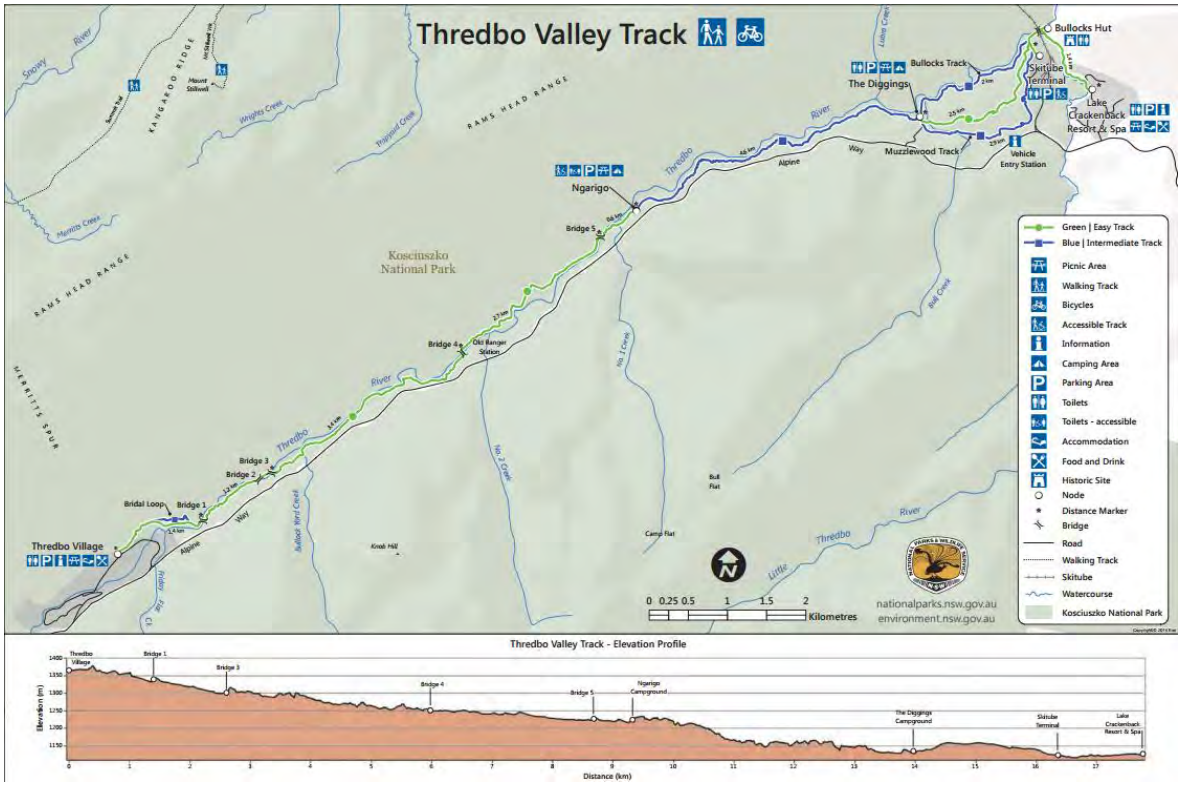


Figure 1: Thredbo Valley Track Trail Map (Source: Snowy Mountains Tourism)

With the aim of increasing summer tourism visitation, KT decided to reinvigorate the summer mountain bike offering with a new focus on mountain biking commencing with the construction of a new chairlift accessed trail called the Kosciuszko Flow Trail, in the summer of 2011/2012.

This trail was opened in December 2011 and was constructed using in part existing trails and disturbed ski slopes.

The trail offers an intermediate level 5.8km gravity fed flow trail that goes from the top of the Kosciuszko Express Chairlift all the way to the village. It is a fun filled trail with rollovers and smooth berms that offers the adrenalin rush of the main downhill trail without all the technical features. The trail takes a less direct route down the mountain making the riding less taxing and giving riders a chance to take in the spectacular scenery.

At the same time, KT purchased the resort mountain bike operations, which included a fleet of hire bikes, safety equipment and a retail outlet. KT offers a range of clinics, sessions and guided tours with expert guides.

With the opening of the Kosciuszko Flow Trail and refurbishments to the Thredbo Downhill Trail, mountain bike visitation for the 2012/13 summer increased from the previous year by around 99%, which is largely attributed to the opening of the new trail and an associated increased marketing effort by KT.

KT engaged World Trail in October 2012 to prepare a master plan to guide the development of new mountain biking trails at Thredbo Alpine Resort over the coming years.

The original 'Thredbo Mountain Bike Trail Master Plan' developed by World Trail, was the result of this fieldwork and delivered a comprehensive vision for mountain bike trails at Thredbo Alpine Resort.

In December 2012, KT applied for a Federal Government Tourism Industry Regional Development Fund (TIRF) grant and was awarded a grant of $250,000 (on a matched dollar-for-dollar funding basis) for the development of Stages 1 & 2 of the Thredbo Mountain Biking Trail Network.

In August 2013, a Development Application (DA 6114) was lodged for the Stage 1A trails, which represented the first component of the implementation of the Thredbo Mountain Biking Trail Network and formed an integral component of achieving the milestones set out under the TIRF grant.

Development consent for DA 6114 was granted in December 2014, with the Stage 1A trails constructed and finished during the summer of 2015/16.

In June 2014 a Development Application (DA 6571) was lodged for the Stage 1B trails, which included the upper section of the All-Mountain Trail and the Downhill Link trail.

This DA was approved in December 2015, with the construction of the trails finalised at the end of the 2016/17 summer.

In October 2015, the NPWS submitted an Activity Application, including Review of Environmental Factors (REF) for approval of an extension to the TVT, known as the lower Thredbo Valley Track. The existing TVT would then be known as the upper TVT.

The lower TVT is an 18km shared use trail between Bullocks Flat (Skitube bridge) along the northern edge of the Thredbo River (within Kosciuszko National Park) down to the Gaden Trout Hatchery and onto the Thredbo River picnic area at Kosciuszko Road, as shown in figure 2 below.

The trail links between Thredbo's All Mountain Trail which descends from Eagles Nest to Friday Flat, which then connects to the upper TVT, down to the Gaden Trout Hatchery where a bridge has been constructed over the Thredbo River to connect with a future trail by Council to Hatchery Bay on the lake. This will then connect to Lake Jindabyne Community Trail that extends from Hatchery Bay to the Jindabyne township and onto Tyrolean Village, via the Mill Creek trail.

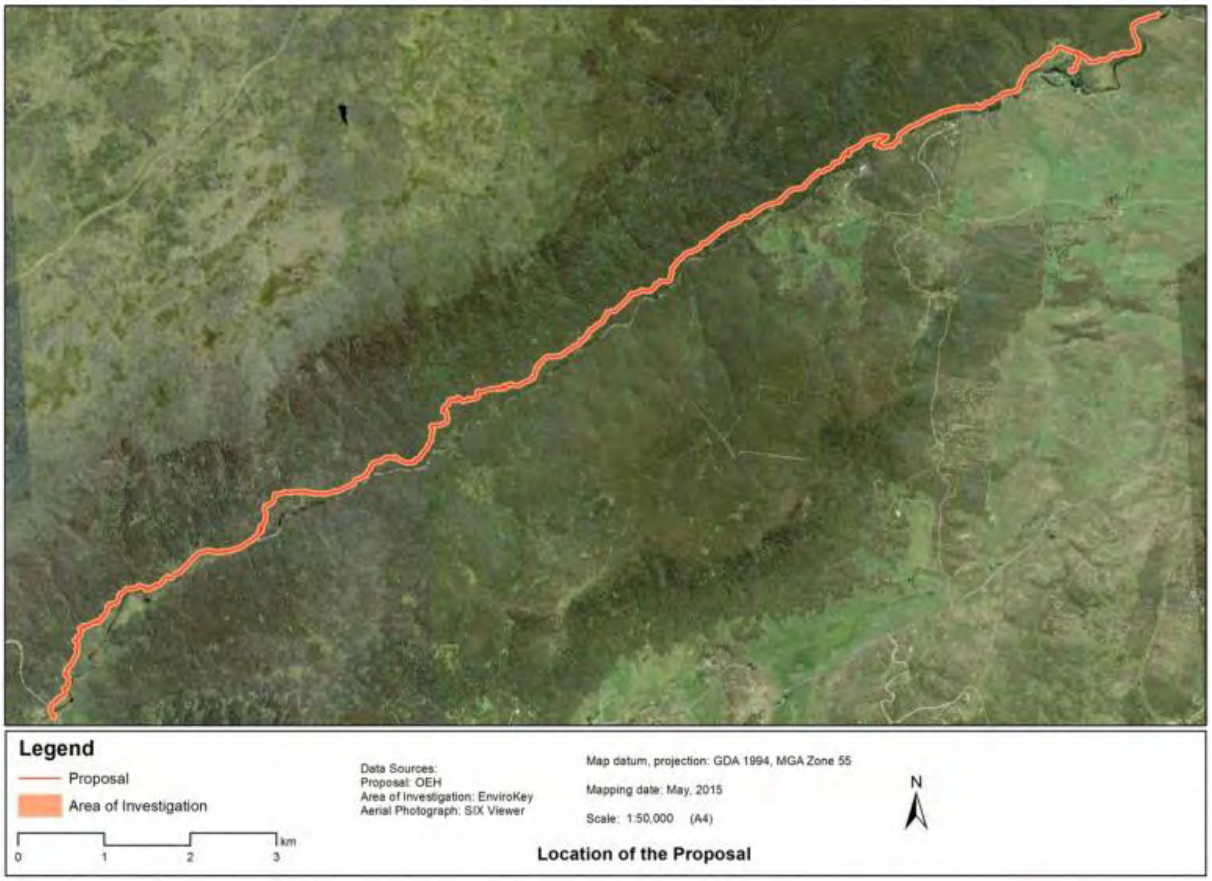


Figure 2: Lower Thredbo Valley Track Trail Map (Source: Snowy Mountains Tourism)

This Application was approved in November 2015, with construction commencing shortly thereafter. This trail is now complete and opened during the summer of 2019/20.

In June 2017 a Development Application (DA 8575) was lodged for the Stage 1C trails, which included Trails N1, N2 & N3. Trail N1, now known as 'Easy Street', is a 1.5km link trail between the All-Mountain Trail and the Kosciuszko Flow Trail which provides an alternative trail between the top of the Gunbarrel Chairlift to the Kosciuszko Flow Trail.

The was approved in February 2018, with the trails completed.

In December 2018 a Development Application (DA 9823) was lodged for Trail N6, now known as 'Ricochet', a 3.1km intermediate flow style trail from the top of the Gunbarrel Chairlift which uses the Easy Street Trail (N1) before diverting off and following the High Noon ski run. The trail connects into the All-Mountain Trail just above the Dream Run ski run. The trail is accessed via the Gunbarrel Chairlift and the Upper All Mountain trail.

This was approved in May 2019, with its construction completed in December 2019.

In May 2019 a Development Application (DA 10312) was lodged for the Lower N4 Trail, a 3.1km 'easy-intermediate' flow style mountain bike trail that commences at the bottom of the Merritts ski slope area, base of the Easy Rider Terrain Park (adjacent to the bottom station of the Easy Rider T-bar). The trail crosses under the Gunbarrel Chairlift and passes the new mid-station of the Merritts Gondola (allowing uploading) and connects into both the All-Mountain Trail below the High Noon ski run and the Friday Flat Loop trail on the High Noon ski run.

This was approved in December 2020 with construction being completed in May 2021, ready to be opened for the 2021-22 summer season.

On 1 August 2021, a Development Application (DA 21/11529) was lodged for the Upper N4 Trail, a 2.4km 'easy-intermediate' trail that descends from the All-Mountain Trail to both the Merritts base area and the Lower N4 Trail.

On the 4 August 2021, a Development Application (DA 21/11659) was lodged for the Gondola Connect Trail, a 0.6km 'easy-intermediate' trail that that connects the Merritts Gondola top station and Merritts base area to the Lower N4 Trail and All-Mountain Trail.

The proposed Cruiser Green trail has therefore been designed to connect into the All-Mountain Trail and proposed Upper N4 and Cruiser Blue trails (subject to separate approvals) and therefore represents the next stage of implementing the Thredbo Mountain Biking Trail Network.

2. THE LOCALITY AND SITE

2.1 The Locality

The subject site is located within the Thredbo Alpine Resort, which is in South-Eastern NSW as illustrated in figure 3 below:

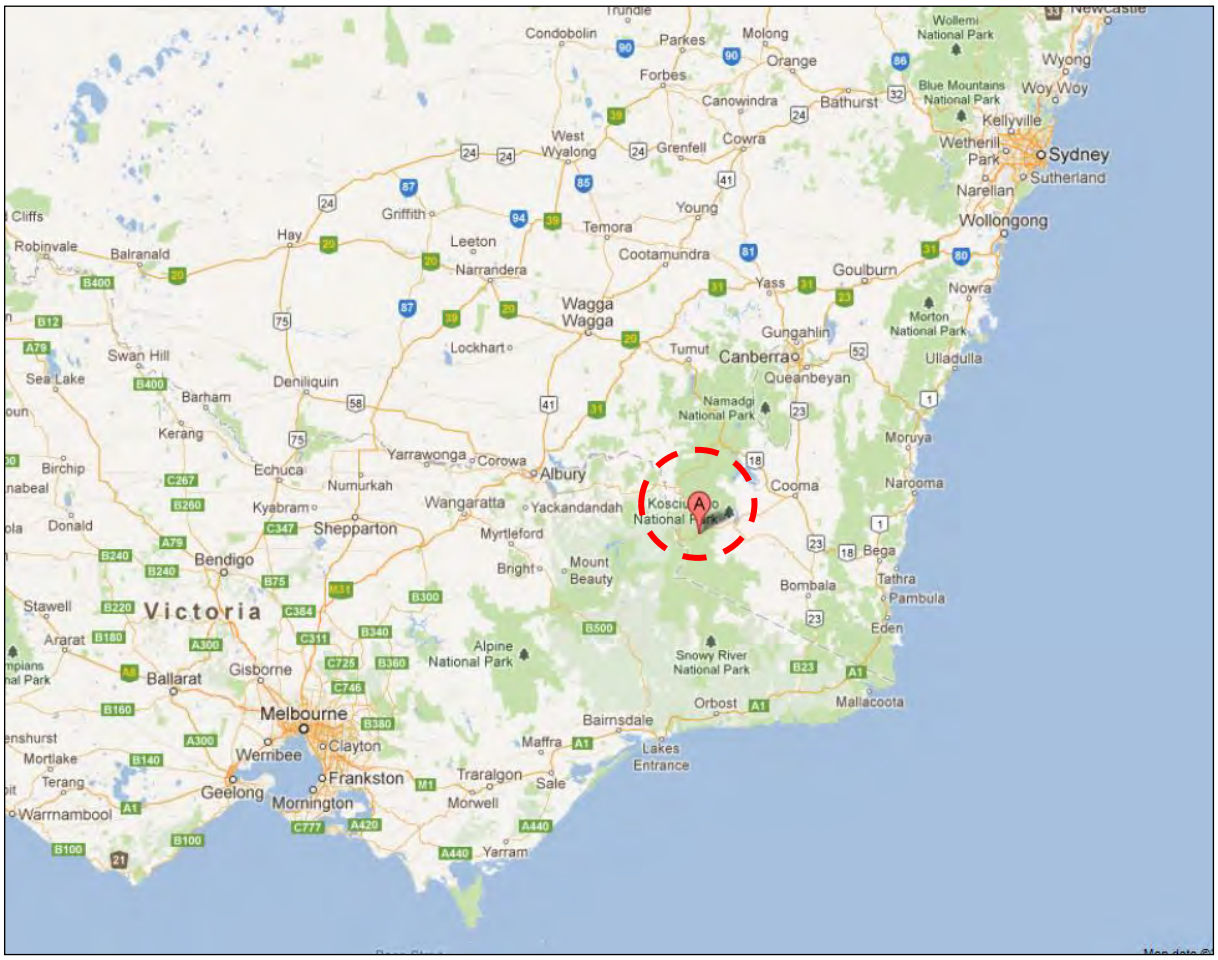


Figure 3: Location of the Thredbo Alpine Resort in context with South-Eastern NSW (Source: Google Maps)

Thredbo Alpine Resort is located within the southern part of the Kosciuszko National Park.

A map of Kosciuszko National Park is provided in figure 4 below.

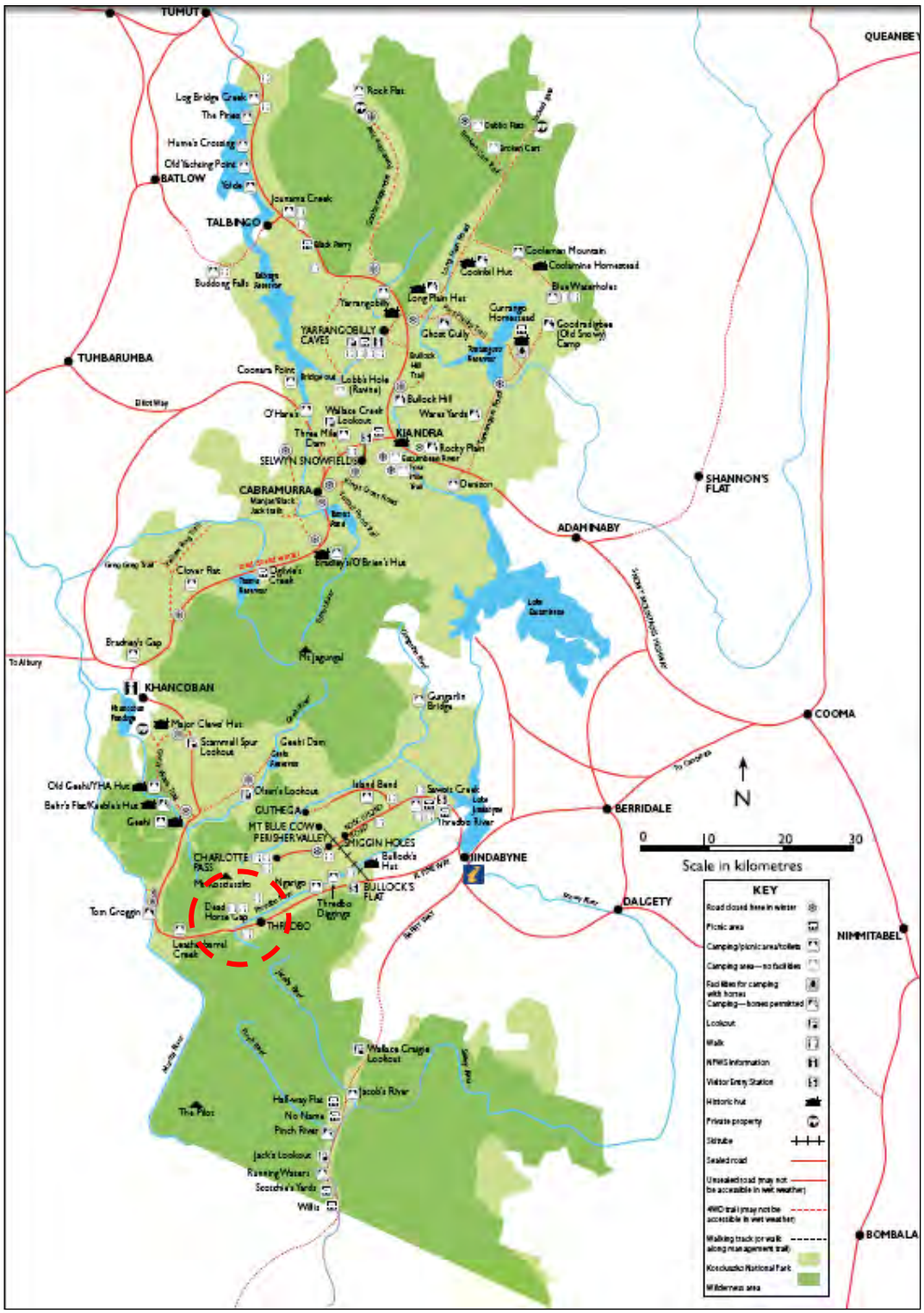


Figure 4: Location of Thredbo Alpine Resort in context with Kosciuszko National Park (Source: NPWS KNP 2011 Guide)

Thredbo Alpine Resort is located approximately 35km from Jindabyne. Access to the resort is achieved via the Alpine Way.

The location of Thredbo is illustrated in context with the regional locality below in figure 5.

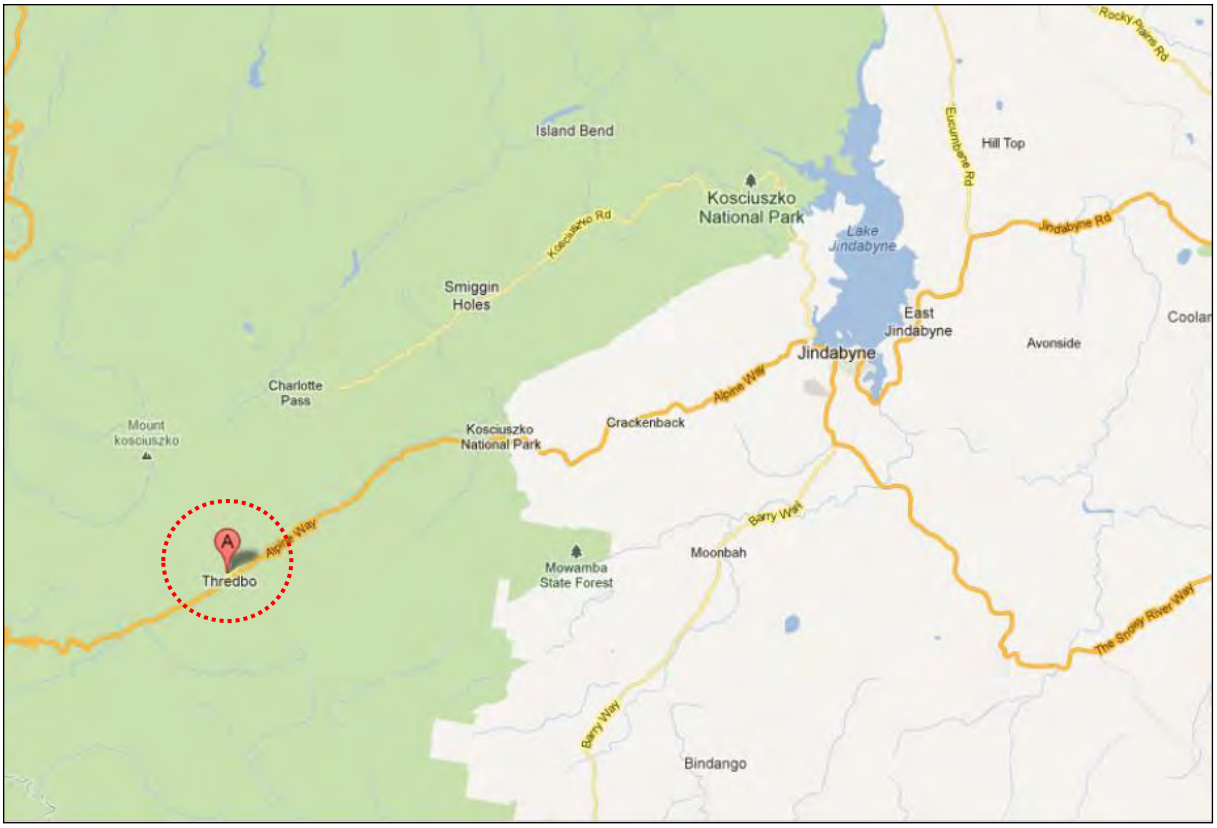


Figure 5: Context of Thredbo Alpine Resort within the region (source: Google Maps)

2.2 The Site

The proposed Cruiser Green trail is approximately 1.4km in length and will be accessed from the top of the Cruiser Chairlift. The trail proposed is generally located west of the Cruiser Chairlift within the upper to mid slopes of the Merritts ski area, within and adjacent to the Playground ski run.

This is shown in figure 6 below.

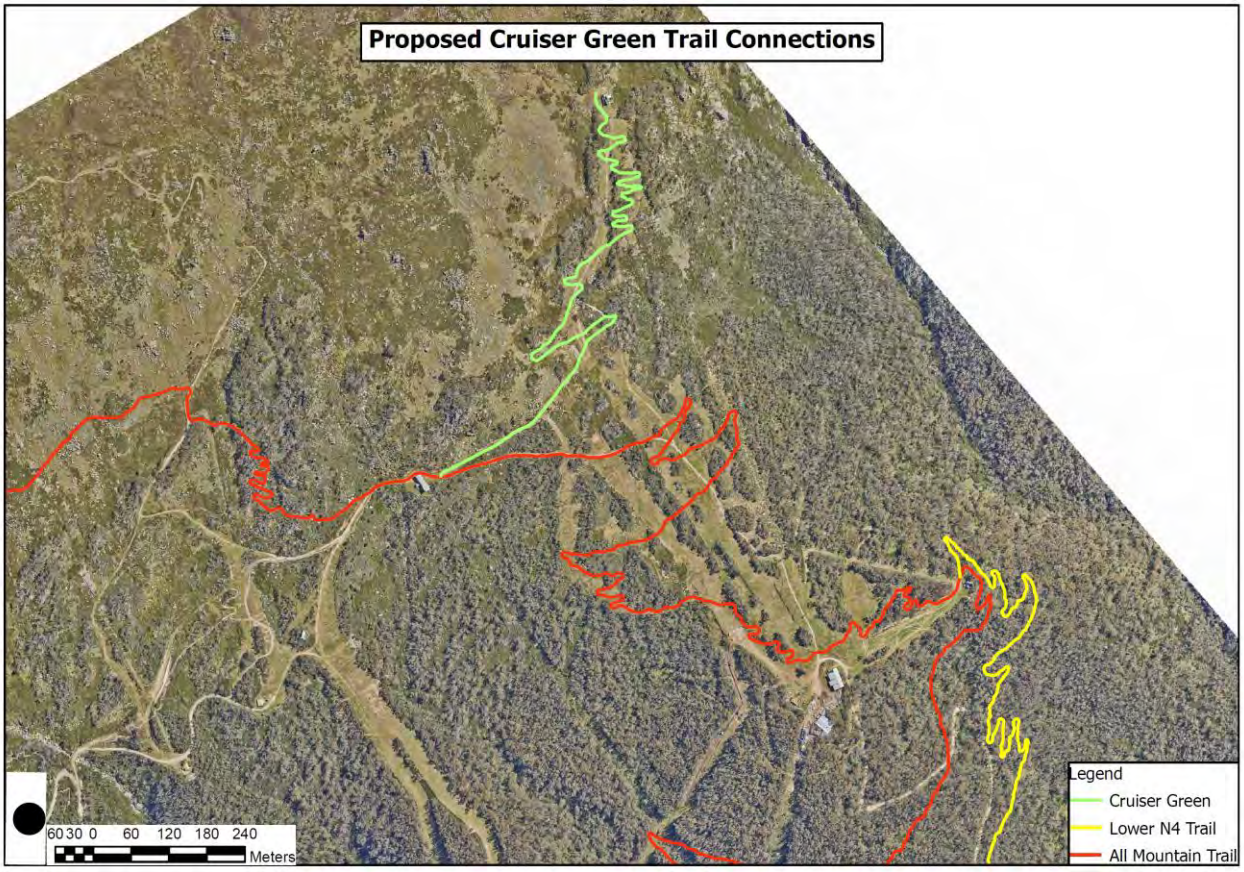


Figure 6: Location of proposed Cruiser Green Trail in relation to the constructed All Mountain & Lower N4 Trails

The top of the Cruiser Green trail will commence at the Cruiser Chairlift top station at an elevation of approximately 1875m.

The trail will descend the open ski slopes and include changes in direction within the tree islands to reduce the gradient of the trail.

The trail will follow in part an existing access road to move further west, following the open and more disturbed ski slopes and using switchbacks to navigate the gradient.

At this juncture, riders will be able to either continue on the trail or chose to ride the proposed new Cruiser Blue trail, which forms part of a separate DA (subject to approval).

The Cruiser Green trail will continue on a westerly direction, using the existing disturbed ski slope (cat track) back towards the Gunbarrel Chairlift, where it will terminate at the start of the Lower All-Mountain Trail. Riders can also choose to head west past the Gunbarrel Top Station on the Easy Street Trail.

The trail will finish at an elevation of approximately 1780m.

The trail has been designed to avoid watercourses, with only two platform sections required to cross over small drainages lines. The proposed trail is located more than 40m from any defined watercourse.

The location of the trail within the resort is shown in the topographic and aerial maps provided in figure's 7 & 8 below.

Figure 7: Location of Cruiser Green Trail (topographic plan)

Figure 8: Location of Cruiser Green Trail (aerial plan)

An extract of the Thredbo Mountain Bike Park Map and the location of the Cruiser Green trail is provided below in figure 9.

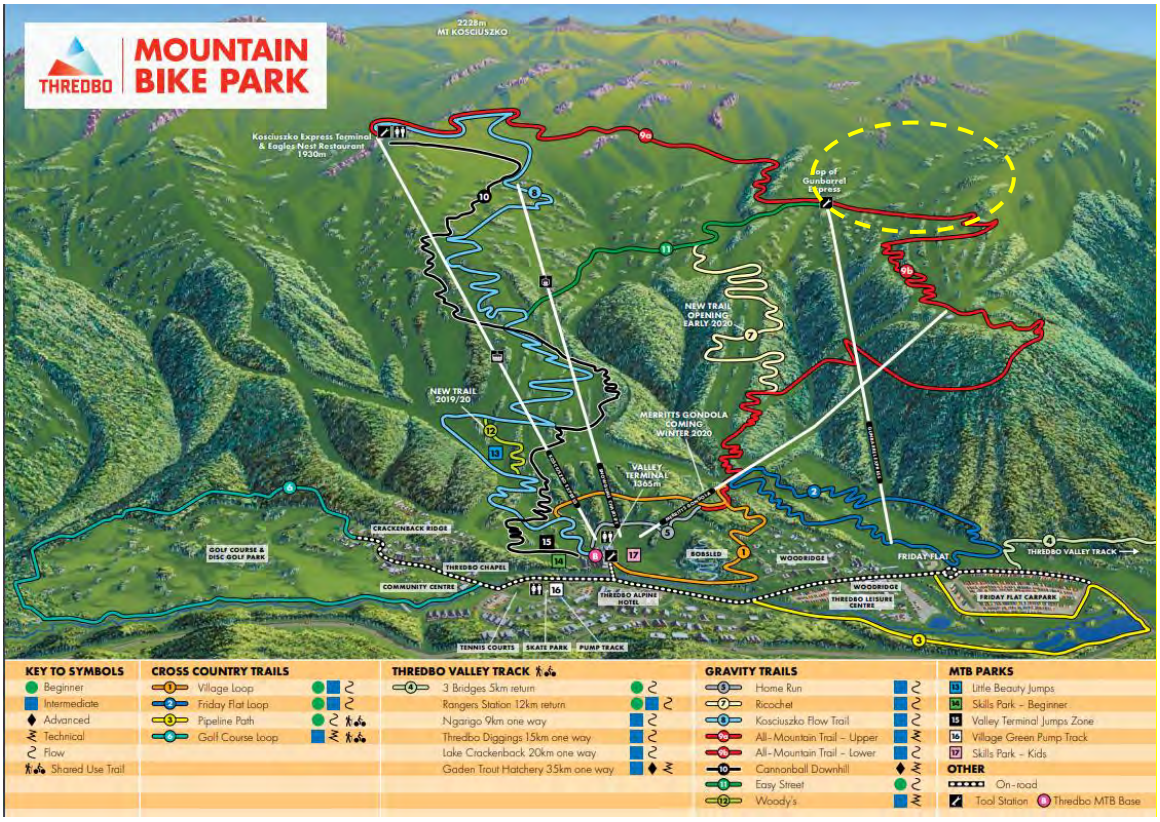


Figure 9: Location of Cruiser Green Trail (yellow circle) in context with the Thredbo Mountain Bike Park Map (Source: Thredbo Alpine Resort)

3. SITE ANALYSIS PROCESS

3.1 Introduction

The final trail network and alignment of the Cruiser Green Trail has been subject to an extensive operational, planning and environmental analysis.

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

3.2 Trail Design Principles

The original key design principles, developed for the All Mountain, Easy Street and Ricochet Mountain Bike Trails have been further refined and applied to the design and siting of the constructed Lower N4 Trail and proposed Cruiser Green Trail, as summarised below.

Key Design Principles:

- Trails for everyone; To create a comprehensive and complete mountain bike destination it must cater for riders of all ability levels from novice mountain bikers to experienced riders and everyone in between.

- Recreation verses competition: The trail network should be designed to allow day-to-day recreational riding while also facilitating competitive mountain bike events.

  The proposed trail network needs to be designed to be adaptive for both recreational riders as well as holding competitions, therefore complying with existing national and international guidelines for competitive course design, but also appealing to recreational riders as well.

- 'Single Direction Trails'; All of the proposed mountain bike trails have been designed for single direction travel only (unless otherwise indicated) as a key risk management technique to minimise the likelihood of head-on collisions between mountain bikers and to maximise the enjoyment of the trail users.

- 'Trail Difficulty Ratings'; All the proposed mountain biking trails should be given a trail difficulty rating under the International Mountain Bicycling Association (IMBA) Trail Difficulty Rating System (TDRS), which is based on the trail difficulty rating system used for ski trails, which traditionally uses the symbols green circle (easy), blue square (intermediate) and black diamond (difficult). Using key parameters such as width, finish, obstacles and style, each trail should also be given a difficulty rating. The use of a rating system is a key risk management technique for managing a mountain bike trail network. It allows riders to make an informed decision about whether they should attempt a trail or not, based on their own skills and ability.

- Trail Names: Each trail should be given a name to assist in giving the trail an identity and are invaluable in marketing the trail network.

- Trails Should Be Designed and Constructed to Minimise Environmental Impacts; Incorporate design and construction principles during the initial development of the trail to minimise erosion. These principles have been developed by IMBA and include the 'rolling contours concept', 'outslope', 'the half rule', 'the 10% average guideline' and the use of 'frequent grade reversals. These are explained in more detail with illustrative examples provided below:

The Rolling Contours Concept:

Figure 10. Example shows the trail following the contour of the slope, rather than down the fall line

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

Outslope:

Figure 11. Example shows the outslope of the trail to shed water

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

The Half Rule:

Figure 12. Example shows an existing fire trail at Mill Creek Jindabyne that was previously used and is steep and follows the fall line, greater than 10%, with the new trail in the background which has followed the half rule

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

The 10% Average Guideline:

Figure 13. Example shows the use of switchbacks to achieve a 10% average gradient even on steeper slopes

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

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

Frequent Grade Reversals

Figure 14. Example shows how the trail uses a dip before proceeding uphill, to allow for drainage (this one includes rock armouring)

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

3.3 Achieving Sustainable Mountain Bike Trails: Flow Chart

The following flow chart has been specifically prepared for this project, outlining the 7 key steps in achieving sustainable mountain bike trails, with the first 4 steps forming part of the site analysis process that has been applied to the design and planning of the Cruiser Green Trail, as discussed further below in Section 3.4.

3.4 Preliminary Site Assessment

The proposed Cruiser Green trail was not contemplated in the original Master Plan as the plan predated the inception of the Merritts Gondola.

The Gondola allows for significantly improved access to the Merritts base area (and therefore Cruiser Chairlift) that did not exist at the time of the Master Plan.

The installation of the Merritts Gondola provides more efficient access to the Merritts ski slope area which allows this area to accommodate additional mountain bike trails focused for the beginner to intermediate level, including improved access to the existing All Mountain Trail.

With connection from either the Merritts Gondola, Gunbarrel Chairlift or All-Mountain Trail, the operation of the Cruiser Chairlift allows for the creation of a Merritts Bike Park Zone, providing a dedicated lift with only 200m of vertical for riders.

This allows for shorter length rides with more laps, rather than long rides over the entire 600m of vertical provided from the top to bottom of the resort. This type of chairlift assisted gravity riding will further enhance Thredbo's position as a market leader.

The concept of zones within Bike Parks is not new, with an example of the Whistler Mountain Bike Park Zones provided below.

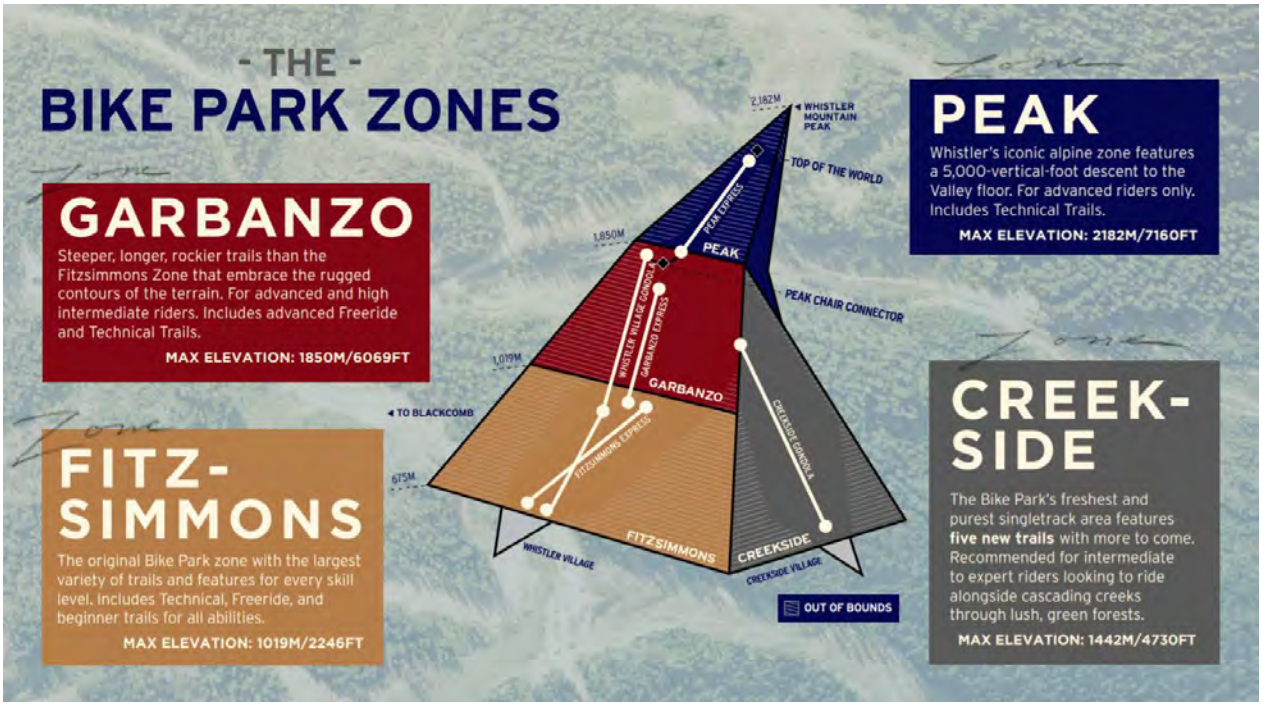


Figure 15: Bike Park Zone Concept (Source: Whistler MTB Park Orientation Guide)

The creation of the Cruiser Green Trail provides for a dedicated easy-intermediate grade mountain bike descent within the Merritts Bike Park Zone, similar to the Lower N4 Trail in that it would offer a gently descending, non-technical trail. This trail is seen as a key component to growing the resort's visitation to include a much greater percentage of complementary market riders.

This trail therefore forms another stage of mountain bike trails as part of the overall Master Plan for mountain biking at Thredbo Alpine Resort. This is part of the implementation of a world class mountain bike trail network across the Thredbo Alpine Resort with an ambition for Thredbo to become the country's most iconic mountain bike destination for recreational riders and events.

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

This included a joint inspection with both the DPIE and NPWS as part of the preliminary assessment process.

Once the preliminary site assessment process was completed and KT were satisfied that the design principles of the trail were being upheld, a further level of assessment and associated fieldwork was undertaken by Eco Logical Australia in regard to biodiversity with input from KT and Dabyne Planning.

This SEE, specifically Chapter 6 provides a summary of the findings of these detailed assessments.

4. PROJECT DESCRIPTION

4.1 Project Components

Cruiser Green Trail - Summary:

Trail Length:	1.4km
Type of Trail:	Flow
Proposed Difficulty Rating:	Easy-Intermediate
Proposed Surface:	Natural Surface
Trail Tread (width):	900mm
Trail Corridor:	2m – 3m / Average 2.5m
Approximate total area of initial disturbance to native vegetation	0.2ha (see BDAR)

Top Station Platform:

The Cruiser Chairlift top station will need to be modified to accommodate unloading of bike riders, with the current load length too short for this function.

Figure 16: Prefabricated temporary platform to be installed at Cruiser Chairlift Top Station

A longer platform can be provided by installing a temporary prefabricated platform that is connected into the concrete slab, with design plans provided separately with the DA and an extract of the long section provided below.

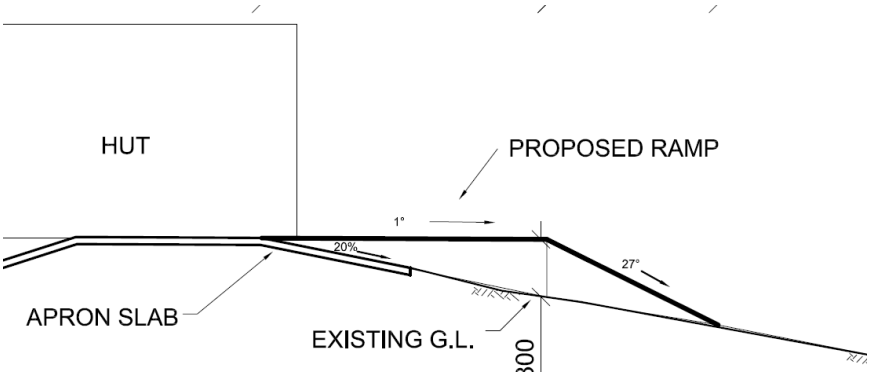


Figure 17: Extract of the Long section of the prefabricated temporary ramp

The temporary platform would be removed at the end of each summer to allow for normal winter operations of the lift.

Trail Description:

The Cruiser Green Trail is a single direction trail that will be accessed by the Cruiser Chairlift top station.

The proposed Cruiser Green trail commences at the Cruiser Chairlift top station, as shown in figure 18 below.

Figure 18: Cruiser Green Trail to depart the Cruiser Chairlift Top Station

The trail heads down the slope south, mostly within the open ski slope, using the tree islands for changes in direction.

Figure 19: Trail to be located mostly within the open ski slope

Figure 20: Trail will traverse through the tree islands for changes in direction

The trail then winds its way down the slope, traversing the open ski slope sections and changing direction within the tree islands.

Figure 21: Trail to traverse the open wide ski slope

At approximate elevation 1825m, the trail then heads in a westerly direction and follows the existing access road.

Figure 22: Trail to follow the existing access road to limit disturbance and use the contour to descend

Figure 23: Trail to follow the existing access road to limit disturbance and use the contour to descend

Where the slope of the land becomes steeper, the trail departs the access road and then heads in an easterly direction.

Figure 24: Trail crosses the ski slope in an easterly direction

The trail alignment traverses the slope above wet areas, with two short sections of platforms to be installed to limit impacts on drainage lines, before the trail heads west and then utilise the existing ski slope back towards the Gunbarrel Chairlift and All-Mountain Trail.

Figure 25: Platforms to be installed to traverse over drainage lines

Figure 26: Trail then to head west and use the existing ski slope back towards the Gunbarrel Chairlift and All-Mountain Trail

Trail Signage:

As part of the construction of Cruiser Green Trail, trail signage is also proposed as it performs an important risk management function of informing trail users about potential risks they will encounter along the trail and aids navigation and education for users about specific risk issues, proper behaviour, designated uses and local flora/fauna.

The proposed signage will convey to trail users the difficulty of the trail by using the IMBA Trail Difficulty Rating System as discussed in the SEE above. The signage will also convey the name of the trail, trail number, pictogram, trail network logo, distance of the trail, etc.

There are two different types of trail signage that will form part of Cruiser Green Trail, which include decision point signs and waymarkers, as discussed further below.

Decision Point Signs:

A Decision Point Sign, like the example provided in figure 27 below is to be used at the start of each new trail, therefore requiring one sign where the trail starts, and one where the trail forks to provide access to the All-Mountain Trail.

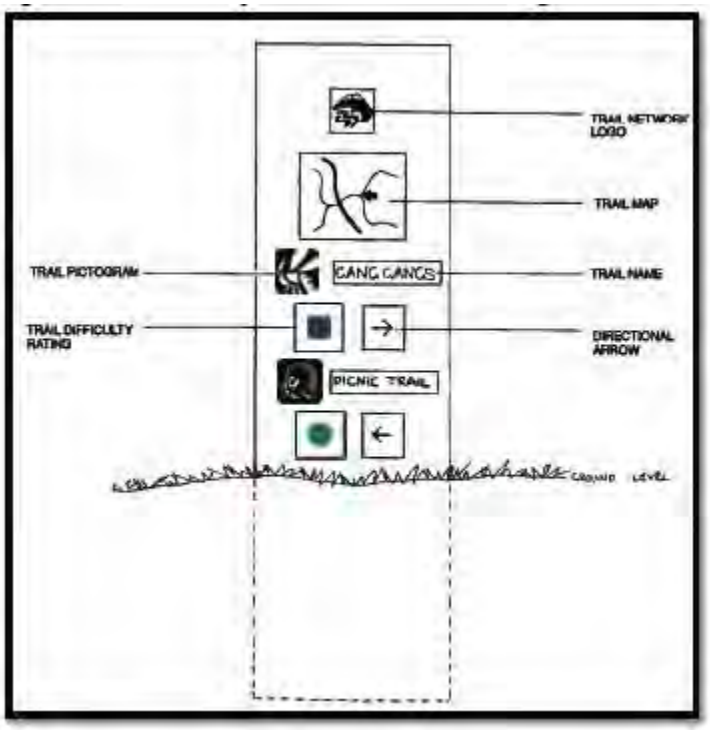


Figure 27: Example of a Decision Point Sign (Source: World Trail)

The Decision Point Sign should provide sufficient information to trail users to allow them to decide as to whether they want to attempt the new trail, or whether they would prefer to remain on their existing trail.

Decision Point Signs are to include the following information:

- The name (and pictogram) of the new trail departing from that point.
- An arrow indicating the direction of the new trail.
- The difficulty symbol of the new trail (i.e., green circle, blue square, black diamond).
- A small map showing the trail user's current location (i.e., you are here).
- The official trail network logo.

Decision Point Signs, like the one shown above will be used, which is 1.5m high x 0.5m wide (covering an area of 0.75m^2)

Standard plans for these signs are provided with the DA separately.

Waymarkers:

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

Waymarkers should be used:

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

On this basis, the Cruiser Green Trail will require approximately three (3) Waymarkers across the proposed trail.

An example of a Waymarker already erected within the resort is provided in figure 28 below.

Figure 28: Example of a Waymarker at Thredbo

Standard plans for these signs are provided with the DA separately.

4.2 General Construction

4.2.1 Trail Construction

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

As the proposed Cruiser Green Trail is proposed be an easy-intermediate flow style mountain bike trail, the trail tread is proposed to be 900mm.

This achieves the requirements of the IMBA standards (trail difficulty guideline, provided in figure 29 below).

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

Figure 29: IMBA Trail Difficulty Rating System (Source: IMBA)

The trail corridor

The trail corridor is usually at least twice as wide as the tread width, depending on the slope. The greater the slope, the wider the corridor due to the extent of the upper and lower batters, as illustrated in figure 30 below.

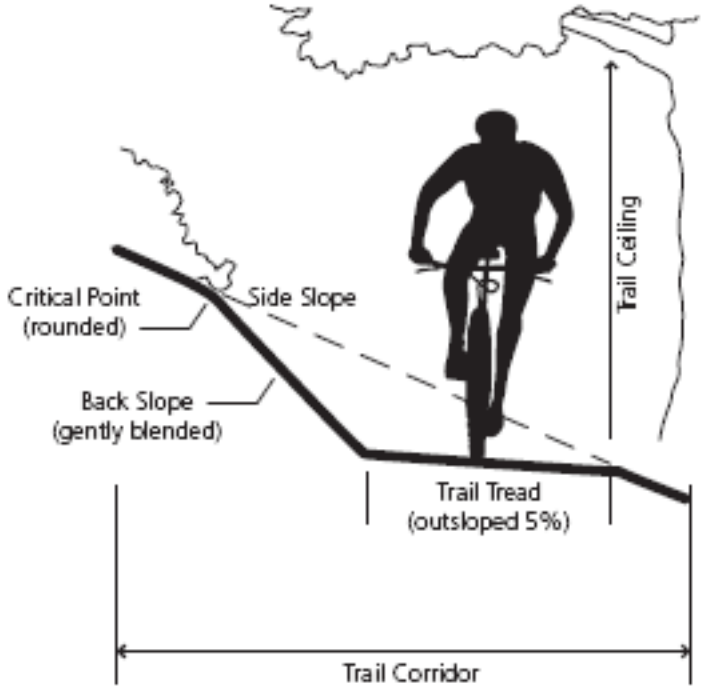


Figure 30: Trail corridor diagram (Source: IMBA)

For the purposes of determining the average trail corridor and therefore average extent of disturbance, the trail corridor has been designed to be wider than an intermediate trail. The trail will therefore be 2m to 3m in width with an average of 2.5m to be used for assessment purposes.

Flexibility in locating the trail corridor

Approval to construct the proposed trails is within a 20m wide corridor (10m either side of the ground-truthed alignment), which is narrow by industry standards (i.e., the Lower TVT was approved with a 50m corridor, although it required the removal of over 36,000m^2 of an Endangered Ecological Community).

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

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

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

Therefore, this principle will be applied to the Cruiser Green Trail.

Trails on sloping ground

Trails built on sloping ground will require some form of excavation to achieve a full or partial bench construction, as shown in figure 31 below. Full bench tread involves excavating down and into the hillside and puts the entire tread width on mineral soil, thereby maximising stability and minimising ongoing maintenance.

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

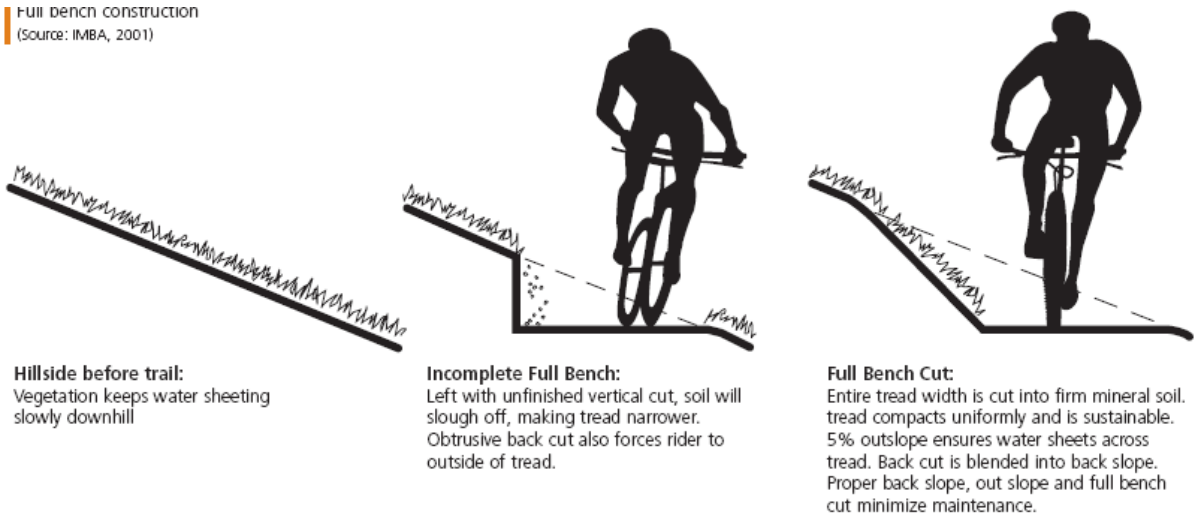


Figure 31: Full Bench Construction (Source: IMBA)

The trail surface

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

Surface water control

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

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

Figure 32: Example of a drain dip, rock hardened on the All-Mountain Trail

Rock Armouring

Rock armouring as shown in the examples below in figure's 33 & 34 are used to harden trails to create an elevated trail tread above wet or soft terrain and to harden the trail tread against user caused erosion.

Figure 33: Example of rock armouring on the Lower N4 Trail

Figure 34: Example of rock armouring on the All-Mountain Trail

Drainage crossings

Drainage crossings are a critical element of trail design and construction. A drainage crossing is the site where the trail 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 as shown in figures 35 and 36 below.

Figure 35: Example of the type of bridge and platform structures used on the TVT

Platforms will be low profile and located close to the ground, and therefore handrails are not likely to be required. If handrails are required, an example of a platform with a handrail located on the All-Mountain Trail is provided below.

Figure 36: Platform with a guard rail on the All-Mountain Trail

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 as shown in the example photos above and the standard modular plan developed for the project provided with the DA separately.

Other techniques to cross steep cross-slopes or low-lying wet terrain include rock armouring as discussed above.

4.2.2 Construction Sequence

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

1. Re-flag the trail; as the flagging tape used for the ground-truthing process may become untied or faded (or removed through snow), the trail corridor is to be re-flagged where required.

2. Mark out the exact trail alignment; the exact trail alignment is to be marked out using pin flags to mark the edges of the trail. The pin flags are places on the ground by the trail designer to mark the edges of the trail to be constructed.

3. Clear the trail corridor of vegetation; the next step is to clear the trail corridor of vegetation. The trail is to be aligned to avoid the need to fell large or mature trees (e.g., larger than 200mm in diameter). The goal in this step is to clear the trail corridor back to bare earth, ready for construction and therefore this should be undertaken in 50m sections at a time to reduce the amount of soil exposed.
   Surplus cut vegetation is to be spread into the surrounding heath and used to rehabilitate the exposed soil on the edges of the new trail, rather than import and use hay.

4. Cut the bench; using a mini excavator the slope is cut into and the soil excavated to achieve the appropriate depth. This will be undertaken following the pin flags laid out in the previous step. Any topsoil removed, along the vegetation sods are to be stockpiled close to the track.

5. Clean up the trail tread; the trail tread is then to be cleaned up by removing loose rocks, roots, compacting, back sloping the batter, ensuring outslope and drainage and placing rocks, logs and other obstacles as necessary to define the main riding line. Re-instate the verge areas topsoil and preserved vegetation sods and use the cut heath as a mulch for stabilisation and re-growth.

4.2.3 Construction Timing, Site Compound and Stockpile Site

Construction for the proposed development is programmed to commence during the summer of 2021/22.

Details on construction work areas, site compound and stockpile sites are provided in the DSEMP in Appendix A.

4.3 Trail Maintenance & Monitoring

4.3.1 Trail Maintenance

Ongoing maintenance is a major component of an effective trail management program. Whilst the future maintenance program will be substantially minimised through the sustainable trail design and construction process.

The previous maintenance recommendations from All Mountain, Home Run, Easy Street and Ricochet trails are to be applied to the proposed trail which will assist in reducing damage to the proposed mountain bike trail and subsequent maintenance works to repair that damage.

1. *Close the trail during and after periods of heavy rain;*
2. *Enforce a strict policy of 'no unauthorised trail modifications' and remove or repair any such modifications immediately;*
3. *Any modifications/maintenance to the track should only be conducted by an authorised person/s;*
4. *Install all signs in appropriate locations; and*
5. *Prepare and implement a maintenance plan;*

In accordance with recommendation No.5, a Trail Management Plan will incorporate the Cruiser Green Trail.

4.3.2 Monitoring

The ongoing monitoring and evaluation of the trails is also an important component of proper trail management.

As part of the Trail Management Plan, a monitoring program will be undertaken, and this will include routine trail inspections to identify any problems or changes to the trails that need to be repaired. Any problems that are identified then form the basis for ongoing maintenance works. Routine trail inspections need to be undertaken regularly to be effective. The exact frequency of these inspections should be determined based on the available resources and the length of the trail network, but each trail should probably be inspected monthly as a minimum or in accordance with an IMBA guideline as shown in the extracted table below.

Task	Frequency
Checking trail head and other facilities for damage or vandalism	Monthly if possible
Checking all signage and trail marking and replacing any missing or damaged signs	Two monthly at a minimum
Clearing and/or repairing erosion control devices and other erosion/water issues	Three monthly (monthly if possible)
Checking and clearing all trail surfaces, especially regrowth vegetation	Annually, in spring (or when dry enough) at least
Pruning trail-side and overhanging vegetation	Annually
Checking major structures, such as bridges, boardwalks and walkways	Annually
Arranging a regular Hazard Inspection Report	Annually
Checking currency and distribution of trail brochure and updating when necessary	Annually

Figure 37: IMBA Guideline for monitoring and maintenance schedule

5. KEY MATTERS FOR CONSIDERATION

5.1 Biodiversity

In accordance with the Biodiversity Values Map under the BC Act, 2016, the subject site includes sections of trail located within an area currently mapped as comprising high biodiversity value.

Consequently, the BOS is triggered and a BDAR has been prepared by Ryan Smithers, Senior Ecologist with Eco Logical Australia and an Accredited Person.

The BDAR outlines the measures taken to avoid, minimise and mitigate impacts to the vegetation and habitats present within the development site during the design, construction and operation of the development. The residual unavoidable impacts of the proposed development were calculated in accordance with the BAM by utilising the BAMC. The BAMC calculated that a total of four (4) ecosystem credits and three (3) species credits are required to offset the unavoidable impacts to the vegetation and habitat present within the development site.

As a result of payment to the BCF for these offset credits, the physical implementation of offsets within the resort is not required. Furthermore, payment of these offset credits is an alternative to the retirement of biodiversity credits in accordance with Division 6 of the BC Act, 2016.

Serious and irreversible impacts values were also considered as part of the assessment under the BDAR, and the report concluded that the proposal will not result in any serious and irreversible impacts.

A copy of the BDAR is provided in Appendix B.

5.2 Aboriginal Cultural Heritage

Regarding the Due Diligence Code of Practice, DECCW 2010, the generic due diligence process has been followed and documented below.

Step 1. Will the activity disturb the ground surface?

Comment:

The proposed Cruiser Green Trail will result in disturbance of the ground surface.

Step 2. Step 2a. Search the AHIMS database and use any other sources of information of which you are already aware.

Comment:

This search has been undertaken and provided in Appendix C. The search has identified that no Aboriginal sites or places have been recorded within the subject site area.

Step 2b. Activities in areas where landscape features indicate the presence of Aboriginal objects?

Comment:

Previous archaeological studies for the ski slope area of Thredbo as well as the Stage 1A, 1B & 1C Mountain Bike Trails, which have included assessments undertaken by Navin Officer Heritage Consultants, NSW Archaeology, Ironbark Heritage and NGH Environmental have found that there are no previously recorded Aboriginal sites located on or within the vicinity of the subject ski slope area.

These studies were included in the following reports:

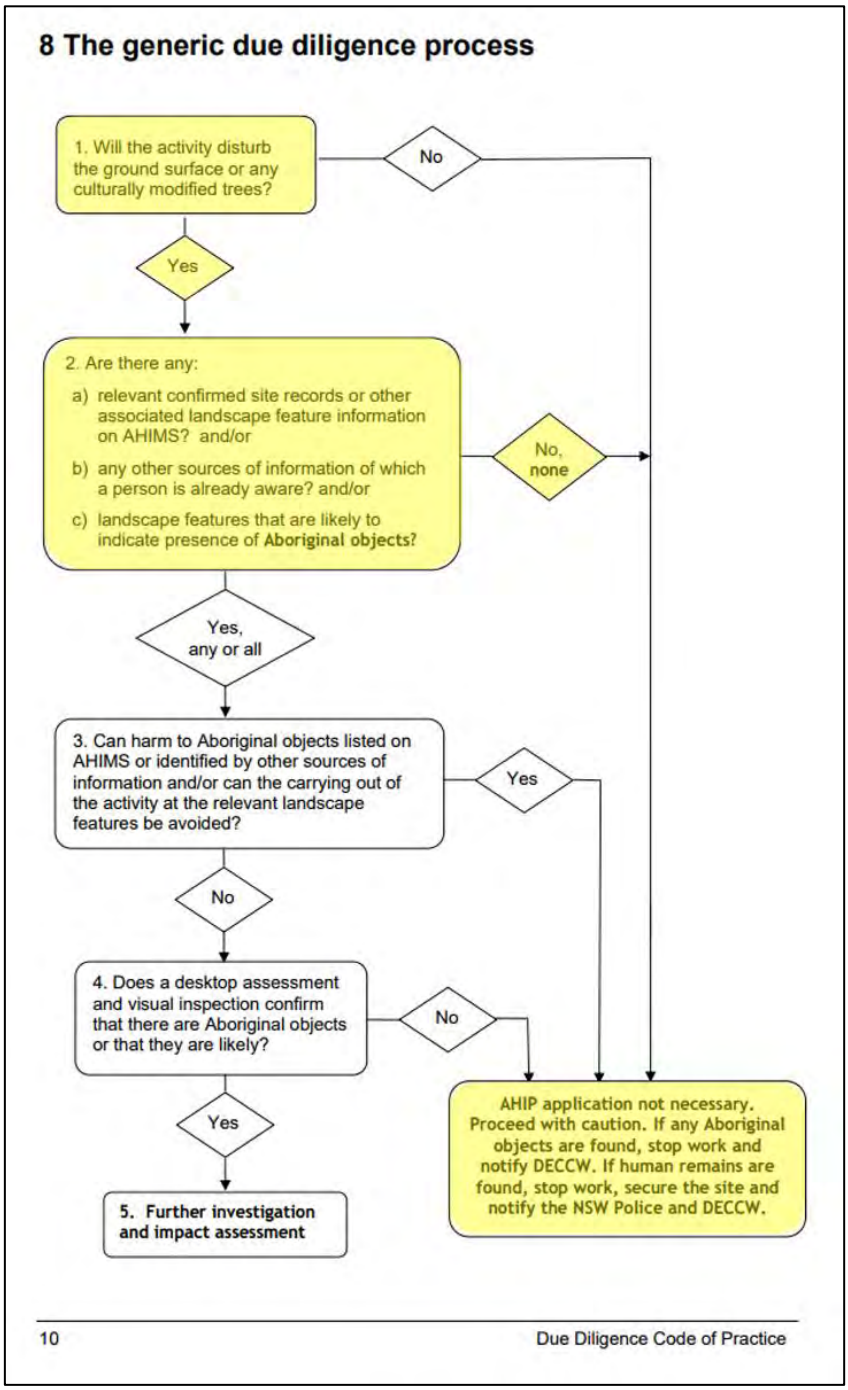
- 'Past Traces Heritage Consultants (2017). Aboriginal Heritage Due Diligence Assessment – Replacement of Merritts Chairlift, Thredbo Alpine Resort.
- 'NGH Environmental (2017). Aboriginal Heritage Due Diligence Assessment – Thredbo Mountain Bike Trails (Stage 1C).
- 'Ironbark Heritage. (2013). A Cultural Heritage Due Diligence Assessment for Thredbo Bike Trails Stage 1 Kosciusko National Park. Report to Dabyne Planning Pty Ltd'.
- 'SEE for the Separation of the Crackenback Supertrail and World Cup Runs, Thredbo, URS Australia Pty Ltd, 2004'
- 'SEE for the Proposed Vegetation Removal, Ski Slopes, Thredbo URS Australia Pty Ltd, 2004'
- 'SEE for Proposed Works on the Tower 10 Ski Run, Thredbo, URS Australia Pty Ltd, 2005'

These studies have identified that due to the slope, orientation and exposure of the ski slope area, being generally steep with an exposed aspect and lack of sheltering tors, they are unlikely to have been favourable campsite locations. The majority of Aboriginal occupation sites are predicted to be on the valley floor in the Thredbo area.

None of the above field surveys identified the presence of Aboriginal objects or assessed the ski slope area as having archaeological potential for aboriginal objects.

This is further supported by undertaking a search of the Departments AHIMS Web Services (Aboriginal Heritage Information Management System) as discussed above.

Therefore, there is no requirement to move onto Step 3, as per the Code below.



This fulfils all reasonable steps in undertaking a due diligence assessment.

In the unlikely event that Aboriginal items are uncovered during excavation, all work shall cease at that location and the relevant government authority shall be notified.

6. ENVIRONMENTAL AND PLANNING LEGISLATION

6.1 NSW Environmental Planning and Assessment Act, 1979

6.1.1 Section 4.15 EP&A Act, 1979 – Matters for Consideration

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

State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007

The only applicable Environmental Planning Instrument to the proposed development and site is State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007 (SEPP Alpine Resorts). The relevant clauses contained within SEPP Alpine Resorts are addressed below:

Clause 11 - Land Use Table:

The land use table for the Thredbo Alpine Resort specifies that 'recreation infrastructure' is permitted with consent. The proposed development is for the purpose of 'mountain bike trails', which falls under the definition of 'recreation infrastructure' as provided below:

*'**recreation infrastructure** means infrastructure provided for the purposes of active or passive recreation for tourists, including walking trails, mountain bike trails, directional signage, cross country ski trails and oversnow routes'.*

The proposed development is therefore permissible with consent.

Clause14 - Matters for consideration:

Matter for Consideration	Response
Cl.14 (1) In determining a development application that relates to land to which this Policy applies, the consent authority must take into consideration any of the following matters that are of relevance to the proposed development:	
(a) the aim and objectives of this Policy, as set out in clause 2,	*The proposed development is considered to be consistent with the aims and objectives of the Policy as the development will provide another important trail as part of the ongoing evolution and improvements to the Thredbo Mountain Bike Park, without generating significant environmental impacts.* *These impacts have been further mitigated through the site analysis process including trail re-alignments and implementation of site environmental management measures.* *The proposed development is expected to generate positive social and economic impacts.*

(b) the extent to which the development will achieve an appropriate balance between the conservation of the natural environment and any measures to mitigate environmental hazards (including geotechnical hazards, bush fires and flooding),	*The proposed development does not require undertaking any measures to mitigate environmental hazards such as flooding, bush fires or geotechnical hazards that would impact on the conservation of the natural environment.*
c) having regard to the nature and scale of the development proposed, the impacts of the development (including the cumulative impacts of development) on the following: (i) the capacity of existing transport to cater for peak days and the suitability of access to the alpine resorts to accommodate the development, (ii) the capacity of the reticulated effluent management system of the land to which this Policy applies to cater for peak loads generated by the development, (iii) the capacity of existing waste disposal facilities or transfer facilities to cater for peak loads generated by the development, (iv) the capacity of any existing water supply to cater for peak loads generated by the development,	*The proposed development is intended to increase visitation in summer and therefore will not generate additional peak visitation to the resort, which occurs in winter.* *As such the development is unlikely to impact the capacity of existing transport to cater for peak days or the capacity of the reticulated effluent management system, waste disposal facilities or water supply for the resort.*
(d) any statement of environmental effects required to accompany the development application for the development,	*This Statement of Environmental Effects satisfies this sub-clause.*
(e) if the consent authority is of the opinion that the development would significantly alter the character of the alpine resort—an analysis of the existing character of the site and immediate surroundings to assist in understanding how the development will relate to the alpine resort,	*The proposed construction of an additional mountain bike trail will complement the character of the resort and its summer tourism.* *The proposed development will therefore not significantly alter the character of the alpine resort.*
(f) the Geotechnical Policy—Kosciuszko Alpine Resorts (2003, Department of Infrastructure, Planning and Natural Resources) and any measures proposed to address any geotechnical issues arising in relation to the development	*The proposed trail requires the erection of short sections of platforms. These structures will be covered by a Form 4.*
(g) if earthworks or excavation works are proposed—any sedimentation and erosion control measures proposed to mitigate any adverse impacts associated with those works,	*Earthworks and excavations works are required as part of the development and appropriate erosion and sedimentation control measures as outlined in the Detailed Site Environmental Management Plan provided in Appendix A will mitigate any adverse impacts associated with such works.*

(h) if stormwater drainage works are proposed—any measures proposed to mitigate any adverse impacts associated with those works,	*The proposed development does not incorporate any stormwater drainage works as the trail itself will incorporate effective water diversion measures.*
(i) any visual impact of the proposed development, particularly when viewed from the Main Range,	*The proposed trail is not visible from the Main Range and mostly located within open ski slopes or Sub-Alpine Woodland vegetation.* *Visual impacts as a result of the trail are expected to be minimal.*
(j) the extent to which the development may be connected with a significant increase in activities, outside of the ski season, in the alpine resort in which the development is proposed to be carried out,	*The proposed Cruiser Green Trail is designed to form part of an overall trail network to achieve increased summer tourism.*
(k) if the development involves the installation of ski lifting facilities and a development control plan does not apply to the alpine resort: (i) the capacity of existing infrastructure facilities, and (ii) any adverse impact of the development on access to, from or in the alpine resort,	*Not applicable.*
(l) if the development is proposed to be carried out in Perisher Range Alpine Resort: (i) the document entitled Perisher Range Resorts Master Plan, as current at the commencement of this Policy, that is deposited in the head office of the Department, and (ii) the document entitled Perisher Blue Ski Resort Ski Slope Master Plan, as current at the commencement of this Policy, that is deposited in the head office of the Department,	*Not applicable.*
(m) if the development is proposed to be carried out on land in a riparian corridor: (i) the long term management goals for riparian land, and (ii) whether measures should be adopted in the carrying out of the development to assist in meeting those goals.	*The proposed trail is located more than 40m from the closest watercourse as illustrated in figure 38 below.*
(2) The long term management goals for riparian land are as follows:	
(a) to maximise the protection of terrestrial and aquatic habitats of native flora and native fauna and ensure the provision of linkages, where possible, between such habitats on that land.	*See above.*

(b) to ensure that the integrity of areas of conservation value and terrestrial and aquatic habitats of native flora and native fauna is maintained,	
(c) to minimise soil erosion and enhance the stability of the banks of watercourses where the banks have been degraded, the watercourses have been channelised, pipes have been laid and the like has occurred.	
(3) A reference in this clause to land in a riparian corridor is a reference to land identified as being in such a corridor on a map referred to in clause 5.	

The closest watercourse (a 1st order stream) is located more than 70m from the closest section of trail, being the end of the trail, as shown in figure 38 below.

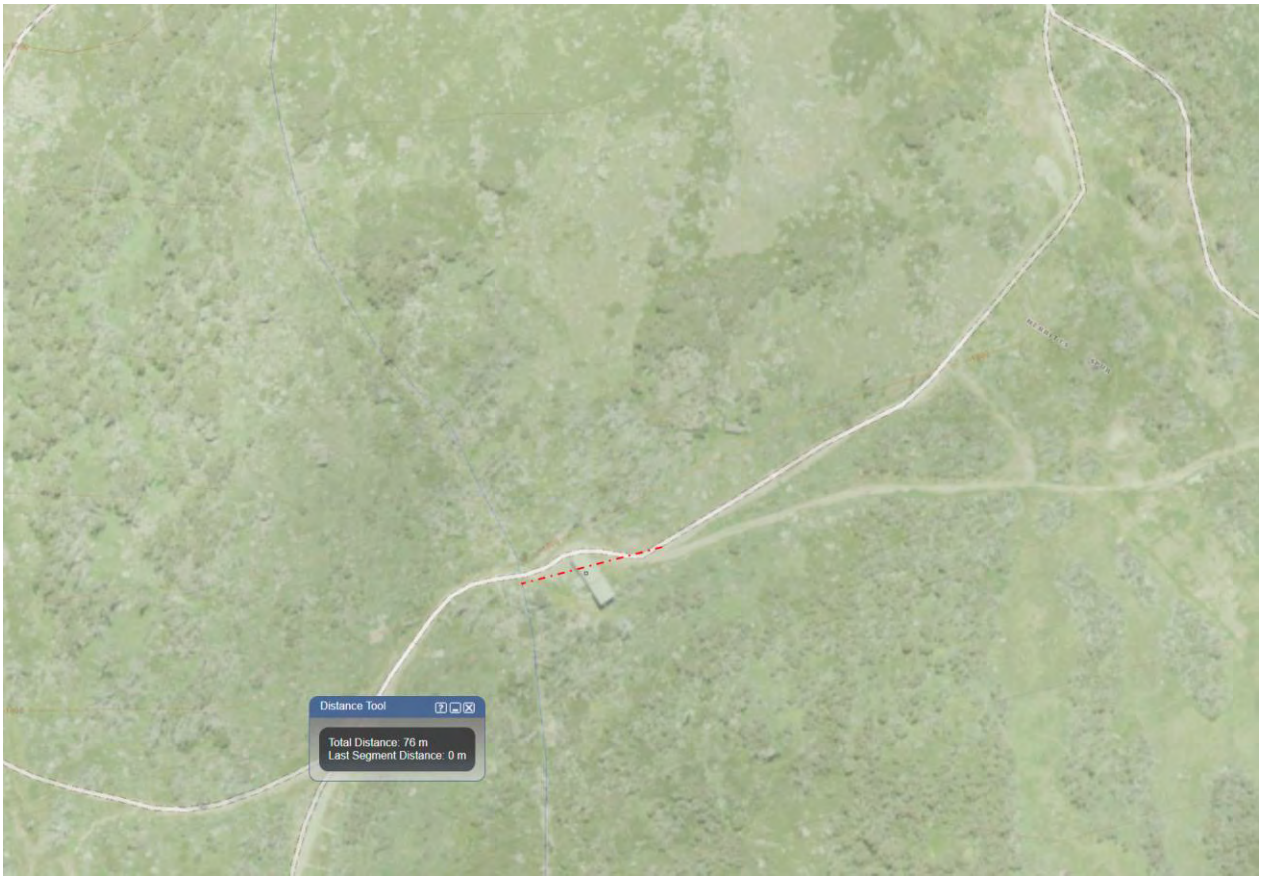


Figure 38: Proposed trail is located more than 70m from closest watercourse

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

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

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

There are no Development Control Plans applicable to the Kosciuszko Alpine Resorts under State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007.

SECTION 4.15(1)(a)(iiia) – PLANNING AGREEMENTS

There are no Planning Agreements applicable to the Kosciuszko Alpine Resorts under State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007.

SECTION 4.15(1)(a)(iv) – REGULATIONS

The development application has been made in accordance with the requirements contained in Clause 50(1A) of the Environmental Planning and Assessment Regulation 2000.

SECTION 4.15(1)(a)(v) – COASTAL MANAGEMENT ZONE

The proposed development and site is not located within any coastal zone management plan (within the meaning of the Coastal Protection Act, 1979).

SECTION 4.15(1)(b) – LIKELY IMPACTS

Natural Environment:

Impacts on the natural environment and in particular biodiversity has been assessed as part of the BDAR provided in Appendix B.

This assessment determined that the proposal will not result in severe and irreversible impacts and includes mitigation measures as well as payment of credits to offset the unavoidable impacts to the vegetation and habitat present within the development site.

Along with the payment of offset credits and the mitigation measures outlined in the BDAR and DSEMP, the likely impacts on the natural environment have been mitigated.

Built Environment:

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

Social and Economic impacts in the locality:

The social and economic impacts from the development are expected to be positive as the development will provide a new easy flow style mountain bike trail as part of the implementation of a world class mountain bike trail network across the Thredbo Alpine Resort with an ambition for Thredbo to become the country's most iconic mountain bike destination for recreational riders and events.

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

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

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

The location of the proposed trail has been subject to an extensive site analysis process. The trail forms part of the expansion of the existing trail network and forms a key component of the Merritts Bike Park Zone.

Overall, the site is considered suitable for the proposed Cruiser Green Trail.

SECTION 4.15(1)(d) –SUBMISSIONS

The proposed trail is located more than 50m from the closest tourist accommodation development and therefore is not required to be publicly notified or advertised.

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

The above assessment has demonstrated that the proposal satisfies the objectives and relevant clauses prescribed under State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007.

Consequently, the proposed development is considered to be within the public interest.

6.2 NSW National Parks and Wildlife Act, 1974

The NSW National Parks and Wildlife Act, 1974 (NPW Act, 1974) governs the establishment, preservation and management of national parks, historic sites and certain other areas. The NPW Act also provides the basis for the legal protection of Aboriginal sites within NSW.

As detailed in Section 5 of the SEE, the proposed development will result in acceptable impacts, which will ensure the development is consistent with the provisions of the NPW Act, 1974.

6.3 Kosciuszko National Park Plan of Management 2006

The Kosciuszko National Park Plan of Management 2006 (PoM) sets out objectives and management strategies for specific areas of the Park. The plan identifies that the Thredbo Alpine Resort is a Management Unit within an Area of Exceptional Recreational Significance (Chapter 10).

The plan also covers recreation and specifically cycling under Section 8.11.

The KNP PoM was amended in 2015, including specific amendment to clauses 8.11.1.3, which states:

8.11.1.3. Permit cycling on all roads, management trails, purpose-built cycling tracks, shared-use tracks and multiple-use trails within the Visitor Services Zone, Major and Minor Road Corridors and Back Country Zone subject to risk and environmental assessments and approval. Development of new cycling tracks will require risk and environmental assessments and approval.

The KNP PoM therefore permits cycling on purpose-built cycling tracks.

Kosciuszko National Park Cycling Strategy:

More recently, the Kosciuszko National Park Cycling Strategy was adopted as required under Section 8.11.1 of the PoM.

The 2017 Kosciuszko National Park Cycling Strategy (KNP Cycling Strategy) is for the management of cycling in Kosciuszko National Park. The document has been prepared by the NPWS. The strategy aims to achieve the following outcomes:

- *increased contribution towards conservation of park values through growth in new markets that enjoy and value national parks*
- *environmentally sustainable, fit-for-purpose cycling opportunities that enhance or protect conservation, recreational, social and cultural values*
- *increased visitation including overnight stays to the Kosciuszko National Park and surrounding region*
- *transparent and consistent assessment of new proposals to ensure they achieve the outcomes above.*

The strategy covers on-road and off-road cycling and in line with the KNP Cycling Policy.

The proposed additional mountain bike trail at Thredbo Alpine Resort is considered consistent with KNP Cycling Strategy.

6.4 BIODIVERSITY CONSERVATION ACT, 2016

The proposed trail is located within areas currently mapped as comprising high biodiversity value and therefore the BOS is triggered under the BC Act, 2016.

As identified in Section 5.1 above, a total of four (4) ecosystem credits and three (3) species credits are required to offset the unavoidable impacts to the vegetation and habitat present within the development site. Therefore, payment to the BCF for these offset credits is required.

As a result of payment to the BCF for these offset credits, the physical implementation of offsets within the resort is not required. Furthermore, payment of these offset credits is an alternative to the retirement of biodiversity credits in accordance with Division 6 of the BC Act, 2016.

The BDAR fulfils the obligations under the BC Act, 2016 and is provided in Appendix B.

6.5 Commonwealth Environment Protection and Biodiversity Conservation Act, 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act, 1999) provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, 1999 a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister or the Minister's delegate.

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act, 1999:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- Wetlands of international importance (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Protection of the environment from nuclear actions (sections 21 and 22A)
- Commonwealth marine environment (sections 23 and 24A)
- Great Barrier Reef Marine Park (sections 24B and 24C)
- The environment, if the action involves Commonwealth land (sections 26 and 27A), including:
    - actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
    - actions taken on Commonwealth land that may have a significant impact on the environment generally;
- The environment, if the action is taken by the Commonwealth (section 28)
- Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

A search of the matters of national environmental significance database for Thredbo Alpine Resort was undertaken and identified that two of the above matters are relevant to the proposed development as addressed below.

National Heritage Listing

Under the EPBC Act, 1999, the 'Australian Alps National Parks and Reserves – Kosciuszko National Park' was included on the National Heritage List on the 7 November 2008. The Alps were listed for their outstanding natural and cultural heritage significance to the nation.

Under the EPBC Act, 1999 a referral must be made for actions that are likely to have a significant impact on a National Heritage Place, such as the Australian Alps.

To determine whether an action is likely to have a significant impact, the significant impact criteria provided in the Commonwealth Department of Environment 'Matters of National Environmental Significance: Significant Impact Guidelines 1.1, 2013 applies.

The Guidelines state that an action is likely to have a significant impact on the National Heritage values of a National Heritage place if there is a real chance or possibility that it will cause:

- one or more of the National Heritage values to be lost;
- one or more of the National Heritage values to be degraded or damaged; or
- one or more of the National Heritage values to be notably altered, modified, obscured or diminished.

An assessment of impact against the National Heritage List Criteria and the National Heritage values of the Australian Alps has been undertaken and provided in the following table below:

National Heritage Assessment Table

Criterion	Impact on Values
(a) the place has outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural or cultural history	*The Australian Alps National Parks (AANP) is listed under this criterion for its glacial and periglacial features; fossils; karst areas; biological heritage; moth feasting; transhumant grazing; scientific research; water harvesting; and recreation.* *The proposed development would not conflict with any of the above values of the AANP.* *Importantly, the proposed development would enhance one of key values in regard to recreation, which is described below:* *'The AANP has outstanding heritage value for the longevity and diversity of its recreational use. Snow sports commenced in Kiandra in 1861 with the establishment of the Kiandra Snowshoe Club and expanded from an ad hoc activity by enthusiasts to a multi-million-dollar snow sport and tourism industry characterised by the groomed ski slopes, ski lift infrastructure and substantial village resorts'.* *The proposed trail presents another instalment of part of a mountain bike trail network which will enhance summer tourism and represents a direct improvement to the visitor experience to the resort, whilst undertaking economic investment in the resort.*

(b) the place has outstanding heritage value to the nation because of the place's possession of uncommon, rare or endangered aspects of Australia's natural or cultural history	*The Australian Alps is listed under this criterion for its landscape and topography; glacial and periglacial features; fossils; alpine and sub-alpine systems; and eucalypt flora communities.* *The proposed development would generate minimal impacts on the overall landscape of the Australian Alps and would not conflict with any of the above heritage values.*
(c) the place has outstanding heritage value to the nation because of the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history	*Not Applicable.*
(d) the place has outstanding heritage value to the nation because of the place's importance in demonstrating the principal characteristics of: (i) a class of Australia's natural or cultural places, or (ii) a class of Australia's natural or cultural environments	*The Australian Alps are listed for the North-East Kosciuszko Landscape values.* *The subject site is located within the Thredbo Alpine Resort and is not located within the North-Eastern area of Kosciuszko National Park.*
(e) the place has outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group	*The Australian Alps are listed under this criterion for their powerful, spectacular and distinctive landscape that is highly valued by the community.* *These aesthetic characteristics include the KNP main range for its mountain vistas, panoramas, snow covered crests, slopes and valleys, alpine streams and rivers and lakes.* *The proposed development would not directly impact on any of these heritage values.*
(f) the place has outstanding heritage value to the nation because of the place's importance in demonstrating a high degree of creative or technical achievement at a particular period	*Not Applicable.*

g) the place has outstanding heritage value to the nation because of the place's strong or special association with a particular community or cultural group for social, cultural or spiritual reasons	*The Australian Alps have a special association with the Australian community because of their unique landscapes, the possibility of experiencing remoteness and as the only opportunity for broad-scale snow recreation in Australia. The AANP is widely recognised by Australians as the 'high country' and many community groups have a special association with the AANP for social and cultural reasons.* *The proposed trail development will result in additional and improved mountain bike trails within Thredbo Alpine Resort and therefore would not impact on the above values.*
(h) the place has outstanding heritage value to the nation because of the place's special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history	*The place is listed under this criterion for its association with the life or works of prominent people such as Baron Ferdinand Von Mueller, Eugen Von Guerard, writers 'Banjo' Patterson, Elyne Mitchell and David Campbell.* *The proposed development would not have any impact on the life or works of people with importance to the AANP.*
(i) the place has outstanding heritage value to the nation because of the place's importance as part of Indigenous tradition.	*Not Applicable.*

The above assessment has concluded that the proposed development will not have a significant impact on the values of the Australian Alps National Park.

Listed threatened species and communities

An assessment of the impact of the proposed development on all listed threatened species and communities has been undertaken and provided in the BDAR in Appendix B.

The assessment has 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.

7. CONCLUSION

The proposed Cruiser Green trail is intended to be an 'easy-intermediate' grade mountain bike descent that would offer a relatively gently descending, non-technical trail.

The proposed trail has been designed to provide a new trail from the top of the Cruiser Chairlift within the Merritts ski area, allowing for connection into the existing All-Mountain Trail, Easy Street Trail or the proposed new Upper N4 and Cruiser Blue Trails.

With connection from either the Merritts Gondola, Gunbarrel Chairlift or All-Mountain Trail, the operation of the Cruiser Chairlift allows for the creation of a Merritts Bike Park Zone, providing a dedicated lift with only 200m of vertical for riders.

Providing another flow style trail at the northern end of the resort is also intended to ease congestion on the Flow Trail and Kosciuszko Express Chairlift, reducing the impacts associated with rider traffic.

This trail therefore forms another stage of mountain bike trails as part of the overall Master Plan for mountain biking at Thredbo Alpine Resort. This is part of the implementation of a world class mountain bike trail network across the Thredbo Alpine Resort with an ambition for Thredbo to become the country's most iconic mountain bike destination for recreational riders and events.

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

This has included inspection of the proposed trail by both DPIE and NPWS.

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

Where impacts on native vegetation are unavoidable, payment of offset credits will be made to the BCF.

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

To ensure that all the environmental and associated legislation is complied with and fulfilled, the proposed development has been considered in regard Section 4.15 of the Environmental Planning and Assessment Act, 1979, Biodiversity Conservation Act, 2016, National Parks and Wildlife Act, 1974, Environment Protection and Biodiversity Conservation Act, 1999 and State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007.

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

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

As documented in this SEE, this can be achieved whilst fulfilling the broader government policy in support of mountain biking, increasing tourism within the National Park, and achieving year-round visitation whilst minimising impacts on the natural environment including flora and fauna and Aboriginal heritage.

APPENDIX A

DETAILED SITE ENVIRONMENTAL MANAGEMENT PLAN

Detailed
Site Environmental Management Plan

Cruiser Green Mountain Bike Trail
Thredbo Alpine Resort

8.09.2021

Table of Contents

ATTACHMENTS

1 INTRODUCTION

1.1 Background

This Detailed Site Environmental Management Plan (DSEMP) has prepared for the Cruiser Green Mountain Bike Trail at Thredbo Alpine Resort.

The purpose of this plan is to provide detail of the management of the construction process in order to protect the existing environment in and adjacent to the proposed works.

1.1.1 Project Description

A detailed description of the development proposal is included within section 3 of the *Statement of Environment Effects* that this report forms an Appendix too.

1.2 Objective

The objectives of this DSEMP are to provide a platform:

(a) That identifies environmental objectives;

(b) That details environmental management guidelines and procedures, and ensures that Kosciuszko Thredbo Pty Ltd ('KT'), and the construction contractor are aware of these procedures, who is responsible for implementing and maintaining the required safeguards; and

(c) That provides guidelines for incidents and emergencies.

1.3 Legislative/statutory requirements

The activity must comply with the following legislation/standards:

- Environmental Planning and Assessment Act 1979,
- Biodiversity Conservation Act 2016,
- National Parks and Wildlife Act 1974,
- Building Code of Australia,
- Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
- Protection of the Environmental Operation Act 1997,
- Water Management Act 2000,

2 SITE ENVIRONMENTAL ACTIONS

The environmental actions required for the proposed works are provided in Attachment 4.

The table in Attachment 4 provides the timeframe and frequency for the actions and subsequent monitoring, as well as the designation of responsibilities.

This provides a checklist for the efficient use by Contractors and relevant staff, in conjunction with the following environmental objectives:

2.1 *Environmental Objectives*

The Environmental Management Objectives of this DSEMP are as follows:

2.1.1 Soils, geology and geomorphology

- Minimise the potential for soil erosion of the proposed works so as not to impact on the surrounding landscape and hydrological features.

2.1.2 Hydrology and water quality

- Minimise the risk of potential pollution during and following excavation of Creeks.
- Minimise the potential for sediment transport from the site.

2.1.3 Flora

- Minimise potential impacts to native vegetation.
- Rehabilitate with appropriate indigenous and exotic species.

2.1.4 Fauna

- Minimise direct impacts to native fauna and habitat.
- Restore habitat values as quickly as possible following the works.

2.1.5 Social and economic impacts

- Ensure that works conform with the Environment Protection Authority's construction noise criteria.
- Obtain community and visitor understanding of the project to maximise tolerance associated with disruption.

2.1.6 Archaeology

- To minimise impacts on places and artefacts of archaeological and aboriginal cultural significance, consistent with obligations under section 90 of the NPW Act.

2.1.7 Resource impacts

- Minimise waste from the construction site and recycle waste where possible.
- Minimise risk of chemical spills.
- Ensure prompt and effective clean up of any accidental spills.

2.1.8 Visual and scenic

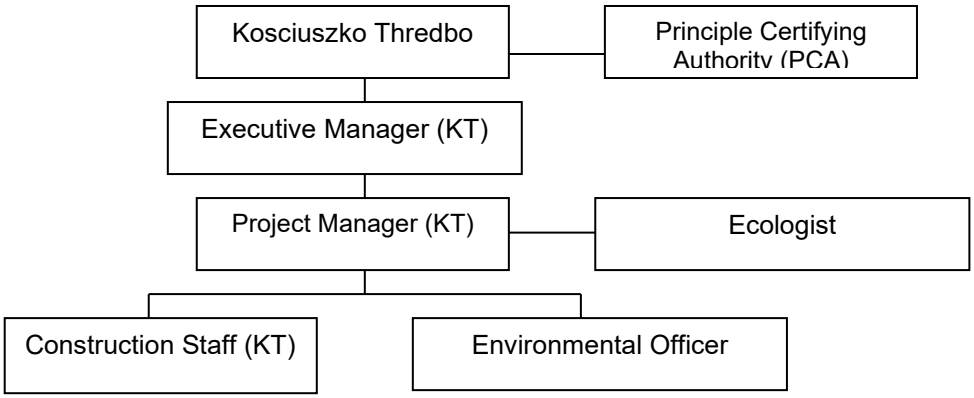
- Minimise visual impact of works during and following construction.

3 MANAGEMENT

3.1 Project Organisational Arrangement

The proposal is funded by Kosciuszko Thredbo Pty Ltd, who will manage its construction, and maintain its operation.

3.1.1 Project Team Structure



3.2 Roles and Responsibilities

The Roles and Responsibilities for each team member is outlined below.

3.2.1 Executive Manager

- Defines environmental responsibilities within the project,
- Develops, implements and maintains this DSEMP,
- Supervises implementation of training/induction,
- Ensures records are kept,
- Ensures environmental requirements are incorporated into the contract document,
- Ensures the requirements of the DSEMP are implemented, and
- Arranges audits/reviews of the DSEMP at appropriate stages.

3.2.2 Project Manager

- Is familiar with contents of this DSEMP,
- Ensuring that all personnel including contractors/sub-contractors comply with the DSEMP requirements relevant to their scope of work.

3.2.3 Construction Staff

- Implement and maintain DSEMP relevant to work being undertaken, and
- Report on compliance as required (Environmental safeguards Action Chart).

3.2.4 Environmental Officer

- Is familiar with the contents of this DSEMP
- Is familiar with contractors Environmental Management Plan
- Observes and monitors contractors compliance on a daily basis,
- Reports on compliance with this DSEMP and Contractors DSEMP, and
- May participate in construction audits.

- Will undertake a weekly inspection.

3.3 Training

All KT staff involved with works, would be made aware of the relevant requirements of this DSEMP. Training would be initiated by site induction. KT is responsible for the site training of all of their employees, and nominated representatives of the contractor. The contractor is responsible for site induction and training of their staff.

Site induction of KT supervisory staff would include:

i) Environmental awareness, including relevant KT policy, the concept of due diligence, and other relevant codes of practice;
ii) Environmental issues including:

- The DSEMP,
- Relevant legislation/licence/approvals,
- Emergency preparedness/procedures,
- Incident reporting,
- Community consultation, and
- Site environmental procedures

3.4 Communication

The communication strategy would mirror the contractual responsibilities illustrated in section 3.2

3.4.1 Stakeholder Consultation

Key stakeholder consultation would occur with DPIE.

3.5 Environmental Control Plans

A Soil and Water Management plan has been prepared and provided in Attachment 2.

3.6 Construction Program & Procedures

3.6.1 Construction Program (Sequence)

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

1. Re-flag the trail; as the flagging tape used for the ground-truthing process may become untied or faded (or removed through snow), the trail corridor is to be re-flagged where required.
2. Mark out the exact trail alignment; the exact trail alignment is to be marked out using pin flags to mark the edges of the trail. The pin flags are places on the ground by the trail designer to mark the edges of the trail to be constructed.
3. Clear the trail corridor of vegetation; the next step is to clear the trail corridor of vegetation. The trail is to be aligned to avoid the need to fell large or

mature trees (eg larger than 200mm in diameter). The goal in this step is to clear the trail corridor back to bare earth, ready for construction and therefore this should be undertaken in 50m sections at a time to reduce the amount of soil exposed.

Surplus cut vegetation is to be spread into the surrounding heath and used to rehabilitate the exposed soil on the edges of the new trail, rather than import and use hay.

4. Cut the bench; using an excavator the slope is cut into and the soil excavated to achieve the appropriate depth. This will be undertaken following the pin flags laid out in the previous step. Any topsoil removed, along the vegetation sods are to be stockpiled close to the track.
5. Clean up the trail tread; the trail tread is then to be cleaned up by removing loose rocks, roots, compacting, back sloping the batter, ensuring outslope and drainage and placing rocks, logs and other obstacles as necessary to define the main riding line. Re-instate the verge areas top soil and preserved vegetation sods and use the cut heath as a mulch for stabilisation and re-growth.

3.6.2 Construction Techniques and Practices

The construction techniques and practices employed for the Cruiser Green MTB trail will be used. These techniques and practices are detailed in the SEE, as informed by the IMBA Guidelines and implemented by the Constructor.

3.6.3 Construction Zone

The diagrammatic plans provided in Attachment 1, identifies the trail location which will form the construction zone for the project.

3.6.4 Site Compound

The diagrammatic plan provided in Attachment 1, identifies the location for the site compound and primary stockpile site to be located at the Merritts base area. This is to be used for the temporary storage of materials, machinery and equipment.

3.6.5 Stockpile Sites

Smaller temporary material stockpile sites will be required along the alignment of the trails to enable management of gravel, platform/bridge materials, soil and vegetation.

These sites will be strategically located:

- At the start and finish of the trails within areas that are highly disturbed
- Within areas away from watercourses
- On relatively flat land
- Provide sufficient area for the storage of materials to minimise, to the greatest extent practical, the number of deliveries required

Based on this criteria, the following stockpile sites have been identified in the diagrammatic plan provided in Attachment 1.

These areas include:

- Merritts base area

All soil stockpiles are to be undertaken in accordance with the Soil Stockpile Guidelines for the Resort Areas of Kosciuszko National Park, October 2017.

3.6.6 Demolition Works

All demolition work shall comply with *AS 2601 The demolition of structures.*

3.6.7 Noise, Vibration and Dust

Construction will take place during off-peak visitation periods unless agreed otherwise with DPIE and KT. The works will take place across the upper ski slopes away from any tourist accommodation.

All vehicles carrying spoil, rubble or vegetation debris to or from the site shall at all times be covered to prevent the escape of dust or other material, with covers to be adequately secured and roadways and footpaths to be kept clean.

3.6.8 Waste Management

All builders' waste and rubbish is to be contained within covered receptacles to prevent litter being blown about the site. All waste will be dealt with according to the Thredbo Village waste management strategy.

3.6.9 Traffic Management and Access

As KT is both the applicant and head lessee, KT will manage all traffic and access as they do on a daily basis with regard to any development within the village.

All construction vehicles will enter the site via the access road (Mountain Service Road) at the base of Friday Flat and will be confined, including unloading and loading to the construction zone identified in the Diagrammatic Plans in Attachment 1.

Construction vehicles to be used will include:

- Excavator & Mini Excavator
- Motorised Wheelbarrows
- Quad Bikes
- Dump Trucks x 2 (to and from Stockpile sites – not on the tracks themselves)
- 4WD vehicles/utilities

On-ground machinery (excavator, motorised wheelbarrow or other machinery) used in vegetation removal and trail construction must adhere to the following:
(a) the tread width of on-ground machinery used in trail construction must not exceed 1500 millimetres; and
(b) activities of the on-ground machinery must be entirely contained within the 3m metre disturbance corridor.

3.6.10 Pedestrian and bike rider management

As KT is both the applicant, constructor, head lessee and manager of all mountain bike operations, bike riders and pedestrian using trails will be managed by use of signage, partial closure of trails and exclusion from the construction zone.

3.6.11 Emergency/Incident Procedures/Fuel and Chemical Spills

Any emergency/incident procedure will follow the document, Construction Site Incident and Emergency Procedures Thredbo Village, 2021/22, that includes reference to spill procedures and emergency and incident responses, including “call the mountain/general manager and 000 for Fire Brigade response”.
The Thredbo brigade has HAZMAT response capabilities, and the village department has spill kits at every village facility (ie pump stations, golf course sheds etc) and a 240-litre bin spill kit available for response.

It would also be a requirement that the contractor has an emergency/incident procedure plan that includes an oil spill response plan. The contractors are responsible for responding to any environmental emergency, including contacting appropriate authorities (KT, NPWS etc). These procedures are detailed in the “Kosciuszko Thredbo Pty Ltd Safety Procedure” document.

3.6.12 Amenities

Toilet facilities are provided at the Merritts Restaurant.

3.6.13 Wet/Adverse Weather Contingencies

Wet and Adverse Weather (inc high winds) will be monitored daily as is currently the situation with the resort operating at least one chairlift 365 days per year. This will rely on standard weather forecasting (ie. BOM) plus weather readings from the Thredbo Top Station weather station.

In the event of wet weather, defined when the ground is sufficiently soaked that safe or efficient construction is not possible, construction will be stopped until the weather clears and the ground is sufficiently dry to commence construction. Standard construction management practices for extreme weather events will be evoked prior to and during adverse weather (inc tie downs, covers, etc).

The Project Manager in consultation with the Environmental Officer and the Contractor will determine what constitutes wet weather, when construction will cease and under what conditions construction will commence.

3.6.14 Inspection and Monitoring

The Environmental Officer will conduct monitoring (e.g. weekly inspections) during all project phases to ensure appropriate environmental controls are being implemented onsite in compliance with this SEMP and conditions of approval.

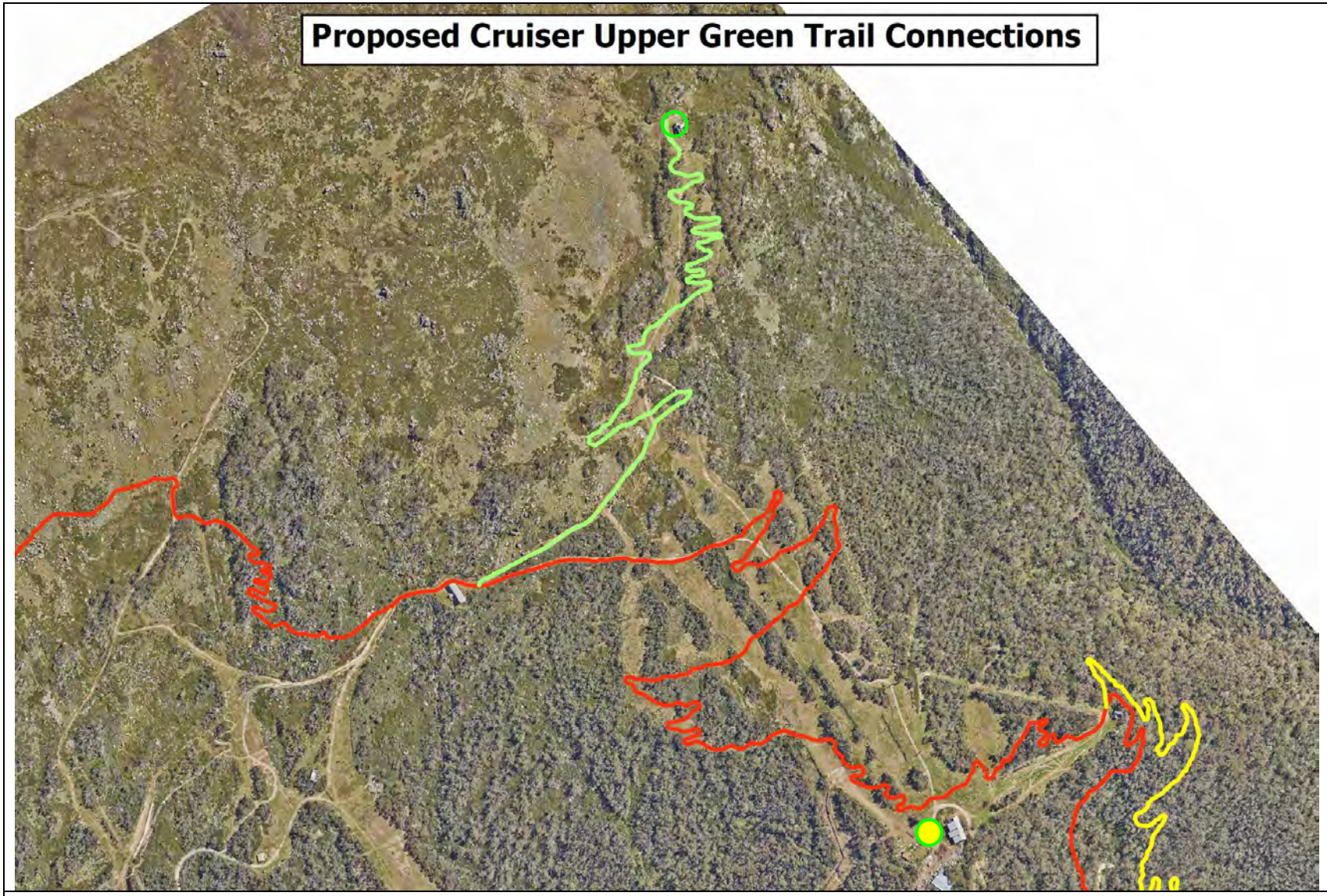
3.6.15 Risk Assessment

A risk assessment matrix has been prepared and provided in Attachment 5.

Attachment 1

Diagrammatic Plan:

Site Compound/Stockpile Sites



Site Compound & Primary Stockpile Site:

Stockpile Sites:

Erosion and Sediment Controls: As per Attachment 2 of DSEMP

DIAGRAMMATIC PLAN – DETAILED SITE ENVIRONMENTAL MANAGEMENT PLAN
CRUISER GREEN TRAIL

Sep 2021

Attachment 2

Soil and Water Management Plan

Soil and Water Management Plan

Erosion and Sedimentation Control

Appropriate environmental management controls will be required where relevant to manage soil and surface water during the construction of the development. Temporary controls will include either a straw bale filter, installed as illustrated Diagram A or a sediment fence in accordance with Diagram B below.

Diagram A: Standard Straw Bale Filter Installation

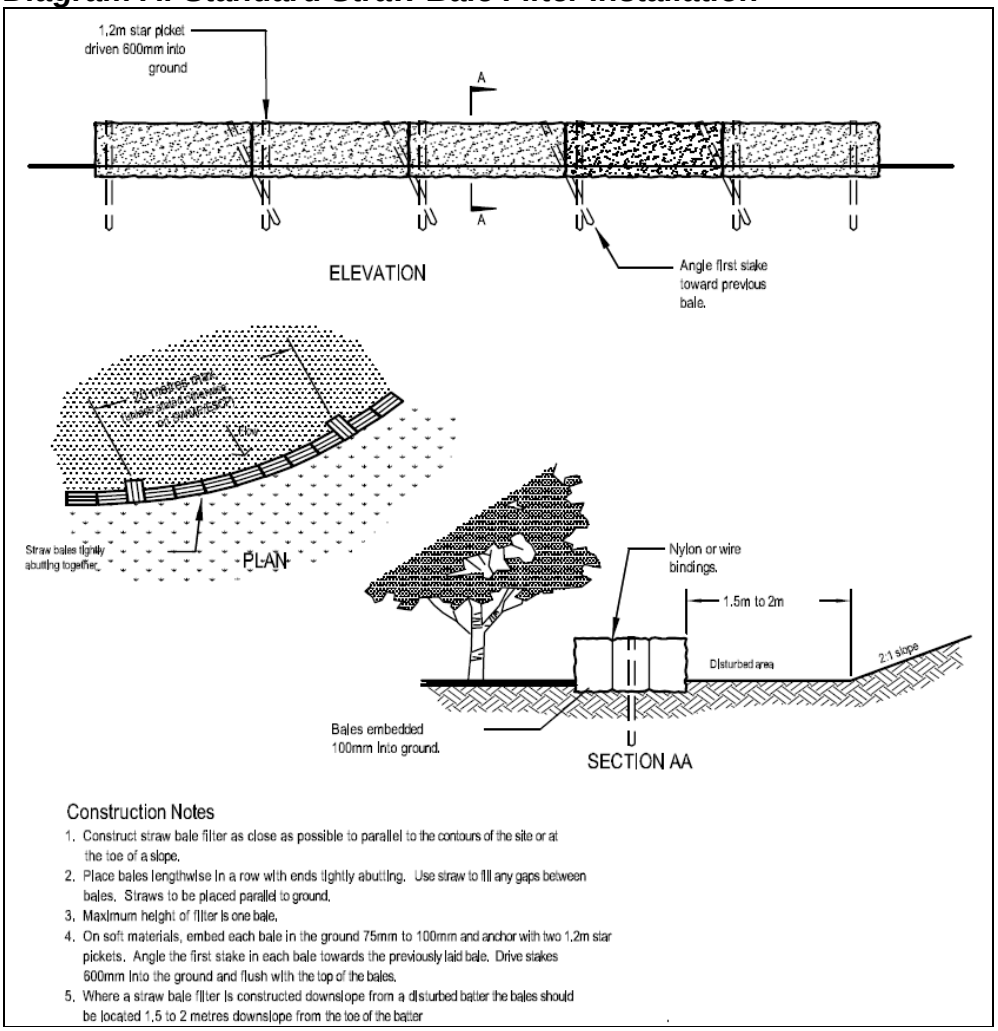
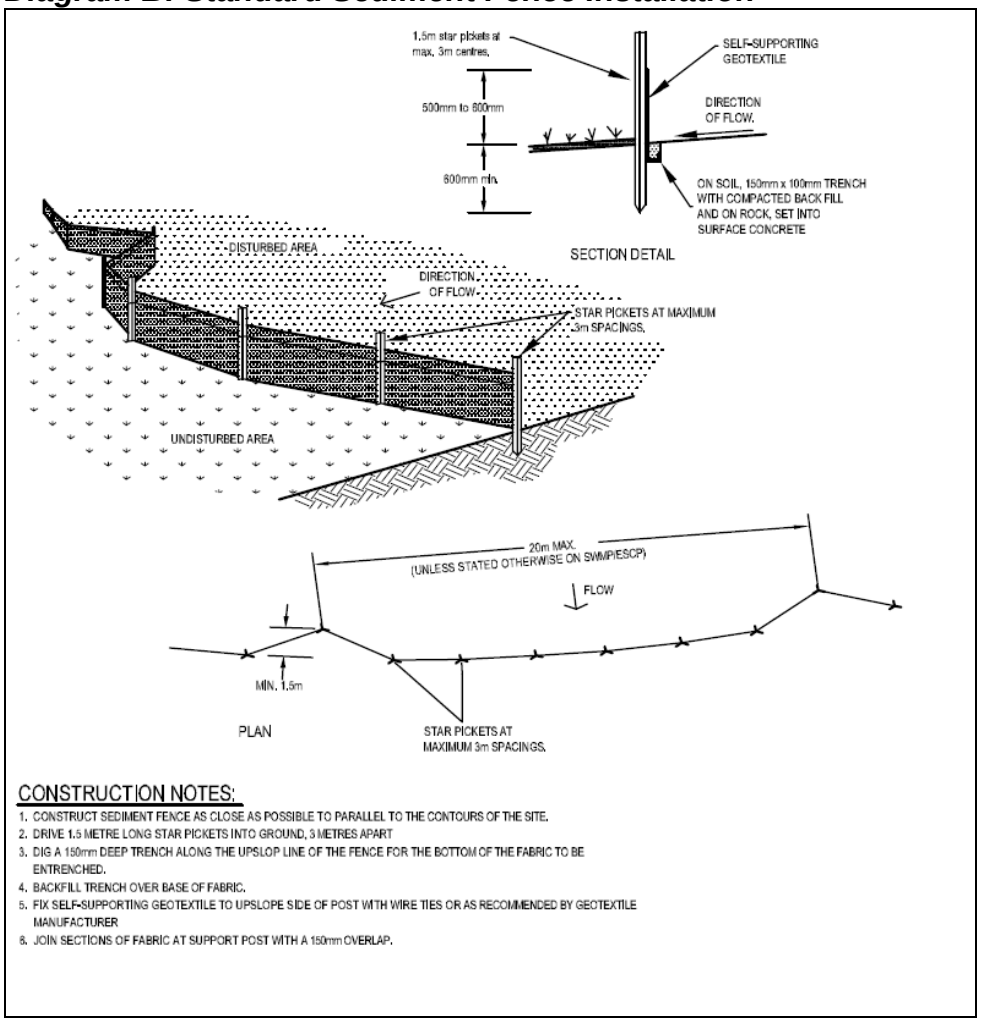


Diagram B: Standard Sediment Fence Installation



Due to the linear nature of the trail construction, and that the trail tread will not be rehabilated (in other words will be left with a natural soil surface), erosion and sediment controls can be undertaken in sections and moved once exposed areas of soil or vegetation are stabilised and/or revegetated.

This is particularly relevant as the trails themselves will be designed and constructed to effectively manage water in a sustainable way, in accordance with IMBA Guidelines for sustainable trail construction.

Therefore, erosion and sediment controls are necessary in areas where stockpiles are located and/or areas where construction is occurring in and around watercourses.

Therefore, the following suite of criteria is to be applied:

- Areas where soil is to be stockpiled is to be surrounded by sediment control fencing and protected from runoff water.
- Works will not take place during rainfall periods.

Water in excavations:

In the event that water needs to be pumped out of any excavations, the following measures are to be adhered to:

- a temporary dam filter shall be installed within the construction zone but outside of any riparian corridor, and shall be constructed of geofabric material or similar;
- the temporary filter dam shall function in a way that it captures sediment and pollutants and prevents them leaving the filter dam; and
- all pump out equipment shall be wholly contained within the construction zone.

Monitoring:

The nominated project Environmental Officer will be responsible for ensuring that all the erosion and sedimentation controls are installed in accordance with the above criteria and are regularly maintained and monitored.

Protection of Native Vegetation & Fauna

The proposed measures to mitigate impacts as set out in Table 23 of the BDAR provided in Appendix B of the SEE are to be followed as per the extract below.

- *If any active wombat burrows are detected in close proximity to the trail alignment during the construction phase, then the trail should be realigned to avoid the burrow.*

- *Identify with flagging tape trail alignment, where it encroaches upon relatively undisturbed native vegetation, prior to construction.*

- *Sediment control measures as necessary such as fencing and hay bales.*

- *Restrict work to daylight hours.*

- *Any machinery or vehicles involved with the proposed works that are not owned by Thredbo will be washed down to remove all soil and vegetative matter before entering the site to limit spread of weeds and disease such as Phytophthora cinnamomi.*

- *Brief all workers as to limit of disturbance footprint and other environmental safeguards.*

- *Post construction rehabilitation consistent with standard Thredbo rehabilitation strategies.*

Attachment 3
Record of Complaint

Record of Complaint, Kosciuszko Thredbo Pty Ltd

For the recording of a complaint or incident (both verbal and written complaints).

Time and Date complaint received:	
Reference number:	
Name of representative who witnessed complaint:	Name and contact details of complainant:
Nature of complaint:	
Action taken in response to complaint:	

Attachment 4
Environmental Actions Table

Attachment 4 - Environmental Actions Checklist

Flora

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
PRIOR TO CONSTRUCTION			
All site personnel shall observe the limits of the works area and be made aware of the importance of vegetation of significant value during the site induction.	Environmental Officer	Site Induction / Prior to Commencement / During Construction	
Identify sensitive areas, also referred to as "No Go" during site induction.	Environmental Officer	Site Induction / Prior to Commencement	
Ensure "No Go" area are appropriately marked to prevent access for staff, contractors and machinery.	Environmental Officer	Prior to Commencement	
Identify with flagging tape trail alignment, where it encroaches upon relatively undisturbed native vegetation, prior to construction.	Environmental Officer	Prior to Commencement	
DURING CONSTRUCTION			
Machinery used during construction must be cleaned prior to site mobilisation, to ensure the machinery is free of mud and vegetative propagules.	Project Manager / Contractor	Prior to Park Entry/ Prior to Construction	

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
Excavated organic matter that cannot be used in the trail base is to be used where possible in the trail batters, particularly on the back of berms. Where surplus organic matter cannot be used it is to be removed from the site. Stems of heath plants, that are too large to be used as mulch on the trail edges, can be distributed throughout surrounding heath where it could be done so without smothering or otherwise damaging the vegetation.	Environmental Officer	During Construction	
POST CONSTRUCTION			
The site is to be progressively stabilised as works are completed.	Project Manager	Upon Completion	
The condition of rehabilitated areas shall be monitored seasonally until permanent vegetation cover is achieved (except for the trail tread).	Environmental Officer	Ongoing / As required by development approval	
Follow up weed control (spot spraying) is to be carried out if deemed necessary.	Environmental Officer	Ongoing / As required by development approval	

Fauna

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
PRIOR TO CONSTRUCTION			
If any active wombat burrows are detected in close proximity to the trail alignment during the construction phase, then the trail should be realigned to avoid the burrow. Alternatively, refer to the adopted Wombat Management Plan.	Environmental Officer	Prior to Commencement / During Construction	
DURING CONSTRUCTION			
Movement of habitat features, (such as large logs) is to be avoided during construction.	Environmental Officer	During Construction	
Accidental leakages and spillage of fuel or lubricant from machinery shall be dealt with by taking immediate measures to contain the spill.	Environmental Officer	During Construction	
Any excavations left open overnight are to be left with an egress ladder for fauna, and checked in morning. If significant fauna are found, sheets of hessian or similar are to be left in sections of the disturbed areas to assist escape.	Environmental Officer / Contractor	At the Start of Each Day	
Trees to be removed will first be inspected to establish whether nesting of native fauna is evident.	Environmental Officer	Site Induction	
Restrict work to daylight hours.	Project Manager	During Construction	

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
PRIOR TO CONSTRUCTION			
If any active wombat burrows are detected in close proximity to the trail alignment during the construction phase, then the trail should be realigned to avoid the burrow. Alternatively, refer to the adopted Wombat Management Plan.	Environmental Officer	Prior to Commencement / During Construction	
POST CONSTRUCTION			
Areas which have been disturbed are to be rehabilitated immediately following the completion of works.	Environmental Officer / Project Manager	Upon Completion	

Erosion and Sedimentation

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
PRIOR TO CONSTRUCTION			
Install Erosion and Sediment Controls (within the Construction Corridor) in accordance with the Soil and Water Management Plan (Attachment 2)	Environmental Officer / Project Manager	Prior to Commencement	
DURING CONSTRUCTION			
Construction activities are to be undertaken within the approved development footprint.	Project Manager	During Construction	

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
Wherever practicable, during the course of construction, exposed areas shall be provided with a cover to minimise erosion and sedimentation.	Project Manager	During Construction	
Erosion and sedimentation controls shall be monitored on a daily basis prior to/immediately following a rainfall event.	Environmental Officer / Project Manager	Following Rainfall/ Daily	
Construction activities shall be programmed to minimise the area of disturbed ground that is exposed to erosion at any one time.	Executive Manager/ Project Manager	During Construction	
Any rock or excess material produced during works are to be used for rock armouring purposes, otherwise are required to be removed from the site and deposited at the Thredbo Tip stockpile site.	Project Manager	During Construction	
POST CONSTRUCTION			
Where nominated for removal, erosion and sedimentation control structures shall be restored to natural contour levels.	Project Manager	Upon Completion	
All exposed soil areas (except for trail tread) shall be appropriately stabilised to prevent erosion.	Project Manager	During Construction / Prior to Rainfall	

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
All exposed soil areas (except for trail tread) shall be appropriately revegetated following stabilisation to prevent erosion.	Environmental Officer / Project Manager	Upon Completion	

Water Quality

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
DURING CONSTRUCTION			
Spill kits shall be readily accessible.	Project Manager	Prior to Commencement	
Spills of any liquids shall not be hosed or flushed away but swept or collected.	Project Manager	During Construction	
Equipment shall be properly maintained to prevent water pollution. All plant and equipment should be inspected daily to avoid leakage of fuel, oil or hydraulic fluid.	Project Manager	During Construction	
No maintenance other than emergency repairs shall be undertaken on site.	Project Manager	During Construction	
All plant/equipment shall be washed out in an appropriately protected area to prevent erosion and pollution to existing drains or natural areas.	Project Manager	During Construction	

Site Working Area

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
DURING CONSTRUCTION			
Ensure that access to the site is restricted to authorised personnel only.	Project Manager	During Construction	
Ensure site and associated plant and equipment is secured when site activities conclude at the end of the day.	Project Manager	End of Each Day	
POST CONSTRUCTION			
Upon completion of construction, the site working areas shall be removed, and the area reinstated as found originally.	Project Manager	Upon Completion	

Air Quality

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
DURING CONSTRUCTION			
Materials transported in open trucks shall be covered to prevent generation of dust.	Project Manager	During Construction	
The tailgates of all vehicles transporting material from the construction site shall be securely fixed prior to loading and immediately after unloading.	Project Manager	During Construction	
POST CONSTRUCTION			

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
Areas no longer required for construction activity shall be progressively stabilised as soon as practicable to assist in controlling dust.	Project Manager	Upon Completion	

Fuel, Chemicals & Hazardous Material (Explosives)

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
DURING CONSTRUCTION			
A container of spill absorbent is to be made available and used for emergency spills of fuel, oil or other chemicals.	Project Manager	Prior to Commencement	
All flammable and/or explosive materials shall be kept in an approved Workcover area.	Project Manager	During Construction	
The use and storage of any herbicides or other chemicals classified as Dangerous Goods Class 6 poison shall be strictly in accordance with the manufacturers instructions and the relevant MSDSs.	Project Manager	During Construction	
No refuelling shall occur within the vicinity of any Upland Bog vegetation community.	Project Manager	During Construction	
POST CONSTRUCTION			

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
Any contaminated material (empty drums, rag, contaminated soil etc) shall be removed immediately from the site and disposed of in accordance with the appropriate regulations.	Project Manager	End of Each Day	

Plant and Equipment

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
DURING CONSTRUCTION			
All plant and equipment used on the subject site is to be placed in existing disturbed corridors to ensure minimal disturbance to the native vegetation.	Project Manager	Prior to Commencement / During Construction	
Emergency procedures shall be displayed in a prominent position in the site working area.	Project Manager	Prior to Commencement / During Construction	
POST CONSTRUCTION			
All work sites including the staging areas shall be restored in a satisfactory manner and where necessary in accordance with the appropriate regulations.	Project Manager	Upon Completion	

Waste Management

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
DURING CONSTRUCTION			
All litter generated on site is to be placed in small garbage bags. At the end of each day, these bags are to be disposed of in appropriate bins.	Project Manager	End of Each Day	
All building waste shall be contained in receptacles so as not to escape by wind or water and these receptacles must only be located in the construction access corridor and/or site compound area (not beneath the canopy or over roots of any trees) and must be cleaned regularly.	Project Manager / Environmental Officer	During Construction	
Regular inspections shall be carried out to ensure the worksite is left in a rubbish free state.	Project Manager / Environmental Officer	End of Each Day	
All employees shall be informed of the need to maintain a clean worksite.	Project Manager / Environmental Officer	Prior to Commencement / During Construction	
Any excess spoil is to be removed from the site, categorised and deposited at the Thredbo Tip stockpile site.	Project Manager	During Construction	
All loads of rubbish removed shall be securely covered to ensure no spillage.	Project Manager	During Construction	

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
To the furthest extent possible, efforts shall be made to reduce, reuse and recycle materials used onsite.	Project Manager	During Construction	
POST CONSTRUCTION			
The worksite shall be left in a tidy and rubbish free state upon completion of the Project.	Project Manager	Upon Completion	

European and Aboriginal Heritage

ACTION CHECKLIST	Who's Responsible	When to be undertaken	DONE (Initial/date)
DURING CONSTRUCTION			
All staff and contractors working on the site shall be advised of the need to notify their supervisor and cease work, if either indigenous or non-indigenous heritage items are encountered.	Project Manager	Prior to Commencement	
Any evidence of Aboriginal relics discovered during construction shall be reported to NPWS. Work in subject area to cease until advice is sought by NPWS.	Executive Manager	During Construction	

Noise and Vibration

ACTION CHECKLIST	WHO'S Responsible	When to be undertaken	DONE (Initial / date)
PRIOR TO CONSTRUCTION			
All equipment to be used shall be correctly maintained and in good working order.	Project Manager / Contractor	Prior to Commencement	
DURING CONSTRUCTION			
Drilling noise should be short-term and water (if available) is to be used to reduce dust generation if dust is created.	Project Manager / Contractor	During Construction	
All construction activities shall be restricted to the hours as stipulated in the development consent issued by the Department of Planning, Industry and Environment (DPIE).	Project Manager	During Construction	
All site works shall be ceased by 30 May unless otherwise agreed to in writing by the DPIE.	Executive Manager / Project Manager	30 May of the relevant year	

Attachment 5
Risk Assessment (Table)

Table 1: Environmental Risk Assessment (Cruiser Green MTB Trail)

Aspect	Activity / Project Phase	Potential Impact	Inherent Risk			Controls	Residual Risk		
			Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating
Clearing beyond the approved construction corridor	Vegetating clearing	Non-compliance with conditions of approval	2	2	Low (4)	Refer to Flora Table in **Attachment 4**, for environmental controls	2	2	Low (4)
Reduction in native vegetation and fauna habitat as a result of vegetation clearing activities	Vegetating clearing	Loss of native vegetation (0.2 ha), loss of potential breeding and/or foraging habitat, loss in population of fauna	3	2	Mod (6)	Refer Flora and Fauna Tables in **Attachment 4**, for environmental controls	2	2	Low (4)
Injury/death to fauna as a result of vegetation clearing activities	Vegetation clearing	Loss in population of fauna	2	2	Low (4)	Refer Flora and Fauna Tables in **Attachment 4**, for environmental controls	1	2	Low (2)
Release of sediments and soils through disturbance of land	Vegetating clearing; earthworks; stockpiling	Loss of topsoil, reduction in water quality from the release of sediment laden water	2	3	Mod (6)	Refer to **Section 3** and Erosion and Sedimentation and Water Quality Tables in **Attachment 4**, for environmental controls	2	2	Low (4)
Generation of dust through operation of vehicles and plant	Vegetating clearing; stockpiling; construction activities	The potential impacts on air quality from the works are considered to be low (closest sensitive receptor >1 km from site)	2	2	Low (4)	Refer Air Quality Table in **Attachment 4**, for environmental controls	2	1	Low (2)
Leak or spill of fuel or oil from fuel storage, plant and vehicles.	Vegetating clearing; Construction activities	Land and water contamination caused by the release of hydrocarbons	2	3	Mod (6)	Refer **Section 3** and Fuel, Chemicals & Hazardous Material (Explosives) and Plant and Equipment Tables in **Attachment 4**, for environmental controls	2	2	Low (4)
Release of noise and/or vibrations through use of heavy/loud plant or equipment	Earthworks; construction activities	Noise and/or vibration nuisance caused through the use of heavy/loud plant or equipment is considered low (closest sensitive receptor >1 km from site)	2	2	Low (4)	Refer **Section 3** and Noise and Vibration Table in **Attachment 4**, for environmental controls	2	1	Low (2)

Transport and loading/unloading of goods and materials and equipment and plant operation	All Project phases	Potential noise impacts on sensitive land uses considered low as closest receptor >1 km from site	2	2	Low (4)	Refer Noise and Vibration Table in **Attachment 4**, for environmental controls	2	1	Low (2)
Introduction and/or proliferation of weed/pest species from vehicles, plant and materials	All Project phases	Loss of biodiversity	2	2	Low (4)	Refer to Flora Table in **Attachment 4**, for biosecurity controls	2	1	Low (2)
Excavation works	Vegetation clearing; earthworks	Potential damage or destruction of unknown Aboriginal or European cultural heritage items or sites; loss of cultural heritage values	2	2	Low (4)	Refer European and Aboriginal Heritage Table in **Attachment 4**, for environmental controls	2	1	Low (2)
Storage and disposal of waste	All project phases	Increase in pest numbers; impacts to road users and/or the environmental from vehicles with uncovered waste loads	2	2	Low (4)	Refer **Section 3** and Waste Management Table in **Attachment 4**, for environmental controls	2	1	Low (2)
Construction vehicles and plants utilising existing road/trail network	All project phases	Inconvenience to existing transport networks/potential traffic impacts from the works are considered to be low	2	1	Low (2)	Refer **Section 3** for traffic, pedestrian and bike rider management	1	1	Very low (1)
Rehabilitation of disturbed areas	During construction; post-construction	Failure of rehabilitation and stabilisation works resulting in increased erosion	2	3	Mod (6)	Refer to Protection of Native Vegetation & Fauna Section in **Attachment 2**	2	2	Low (4)

Risk Matrix

Likelihood and consequence is defined as follows:

- **Likelihood**: the chance that something might happen; and
- **Consequence:** the outcome of an event which may have the potential to change the existing environmental values.

Likelihood	Consequence				
	Extreme (5)	**Major (4)**	**Moderate (3)**	**Minor (2)**	**Insignificant (1)**
Almost certain (5)	Extreme (25)	Extreme (20)	Extreme (15)	High (10)	Moderate (5)
Likely (4)	Extreme (20)	Extreme (16)	High (12)	Moderate (8)	Low (4)
Possible (3)	Extreme (15)	High (12)	Moderate (9)	Moderate (6)	Low (3)
Unlikely (2)	High (10)	Moderate (8)	Moderate (6)	Low (4)	Low (2)
Rare (1)	Moderate (5)	Low (4)	Low (3)	Low (2)	Very low (1)

Likelihood Rating		Definitions
Rare	**1**	Unlikely to occur during a lifetime or very unlikely to occur
Unlikely	**2**	Could occur but considered unlikely
Possible	**3**	Might occur at some time
Likely	**4**	Will probably occur
Almost certain	**5**	Is expected to occur in most circumstances

Consequence Rating		Definitions
Insignificant	**1**	Very low environmental impact confined to a small area within the Project area. Prompt (typically within a shift) clean-up.
Minor	**2**	Low environmental impact confined within the Project area. Short-term (typically within a week) clean-up.
Moderate	**3**	Reversible offsite environmental impact, requiring short-term clean-up (weeks). On-site medium term (weeks) clean-up.
Major	**4**	Major, offsite, environmental impact requiring medium-term clean-up (months). On-site impact requiring significant clean-up effort (months).
Extreme	**5**	Prolonged or severe, offsite or regional environmental impact requiring long-term clean-up (years) with irreversible residual damage. Extensive, Project area impact requiring long-term clean-up and recovery (years).

APPENDIX B

BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

Proposed Cruiser Green Trail, Thredbo Alpine Resort Biodiversity Development Assessment Report

Kosciuszko Thredbo Pty Ltd

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A TETRA TECH COMPANY

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DOCUMENT TRACKING

Project Name	Proposed Cruiser Green Trail, Thredbo Alpine Resort
Project Number	18801
Project Manager	Ryan Smithers
Accredited Assessor Certification	
Prepared by	Ryan Smithers
Reviewed by	Frank Lemckert
Approved by	Ryan Smithers
Status	**Draft**
Version Number	**2**
Last saved on	**6 September 2021**

This report should be cited as 'Eco Logical Australia 2021. *Proposed Cruiser Green Trail, Thredbo Alpine Resort*. Prepared for Kosciuszko Thredbo Pty Ltd.'

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Dabyne Planning Pty Ltd

Template 2.8.1

Executive Summary

Eco Logical Australia Pty Ltd was engaged by Kosciuszko Thredbo Pty Ltd to prepare a BDAR for the proposed construction of a new mountain bike trail and associated works in the Merritts ski area and associated Cruiser Chairlift, within Thredbo Alpine Resort.

Some of the native vegetation within the development site is mapped on the Biodiversity Values map. This report has been prepared to meet the requirements of the Biodiversity Assessment Method 2020 established under Section 6.7 of the NSW *Biodiversity Conservation Act 2016* (BC Act).

The development footprint is approximately 0.35 ha in size. The proposed development has been located to take advantage of existing disturbed areas and minimize the required clearing. As a result, it is anticipated that the proposal will involve the clearing or further modification of only 0.2 ha of native vegetation, approximately half of which is already highly modified. The proposal will require the clearing of understorey and groundcovers only, and will not result in the removal of any mature trees or any associated fauna habitats such as hollows.

The development footprint supports one Plant Community Type (PCT) PCT 645 Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion in three condition states; good, moderate and poor. PCT 645 does not conform to any Endangered Ecological Communities (EEC) listed under the NSW BC Act or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Targeted surveys within the development site and immediate surrounds identified one threatened fauna species, *Mastacomys fuscus* (Broad-toothed Rat), as occurring within the development site. A number of other threatened species are known to occur in adjoining habitats and/or have the potential to occur within the development site, such as *Petroica phoenicea* (Flame Robin). Despite targeted surveys, no evidence of *Liopholis guthega* (Guthega Skink) was detected within the development site or immediate surrounds.

This BDAR outlines the measures taken to avoid, minimise and mitigate impacts to the vegetation and habitats present within the development footprint during the design, construction and operation of the development. The residual unavoidable impacts of the proposed development were calculated in accordance with the BAM by utilising the Biodiversity Assessment Method Credit Calculator. A total of four ecosystem credits and three species credits are required to offset the unavoidable impacts to the vegetation and habitats present within the development footprint.

Serious and Irreversible Impact (SAII) values have been considered as part of this assessment. The proposal will not result in any SAII.

Following consideration of the administrative guidelines for determining significance under the EPBC Act, it is concluded that the proposal is unlikely to have a significant impact on matters of National Environmental Significance (MNES) or Commonwealth land, and a referral to the Commonwealth Environment Minister is therefore not recommended.

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Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method
BAMC	Biodiversity Assessment Method Credit Calculator
BC Act	NSW *Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
CEEC	Critically Endangered Ecological Community
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DPIE	NSW Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FM Act	NSW *Fisheries Management Act 1994*
GIS	Geographic Information System
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Area
NSW	New South Wales
NOW	NSW Office of Water
PCT	Plant Community Type
SEPP	State Environmental Planning Policy
TEC	Threatened Ecological Community
VIS	Vegetation Information System

1. Introduction

This Biodiversity Development Assessment Report (BDAR) has been prepared by Ryan Smithers, an Accredited Person (BAAS17061) to apply the Biodiversity Assessment Method (BAM) under the NSW *Biodiversity Conservation Act 2016* (BC Act). All credit calculations have been undertaken using the BAM Calculator (BAMC) version 2020 in case number 27426. Consistent with the BAM, the streamlined (small area) assessment module has been used for this assessment.

Definitions of terminology used throughout this report are presented in **Appendix A**.

1.1. General description of the development site

The development site comprises existing ski slopes and remnant native vegetation on the edges or in the middle of the ski slopes in the Merritts ski area and associated Cruiser Chairlift, within Thredbo Alpine Resort. Parts of the development site are already heavily modified in association with existing ski slopes and associated infrastructure.

This report includes two base maps, the Location Map (**Figure 1**) and the Site Map (**Figure 2**).

1.2. Brief description of the proposal

The proposed development comprises a 1.4 km long “easy-intermediate” flow style mountain bike trail that commences at the top of the Cruiser Chairlift and descends to connect into the All Mountain Trail. The proposed trail will result in an expected average disturbance footprint of 2.5 m. The proposed works are expected to affect 0.2 ha of native vegetation, approximately half of which are already highly modified.

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

- The clearing of shrubs and groundcovers in a 2-3 m wide corridor where the trail traverses native vegetation. The disturbance corridor is required to contain the upper and lower batters and the trail surface when the trail is traversing across moderate to steep slopes. On gentler slopes the disturbance corridor will be closer to 1.5 m. The average disturbance width is expected to be 2.5 m. The clearing will be undertaken with a mix of hand tools i.e. chainsaws and brush-cutters, and machinery i.e. mini-excavator.
- Some removal of saplings where it is not possible to align the trail to retain them. In general, it is possible to align the trail to avoid tree removal. However, there will be some areas where the removal of some saplings is likely to be unavoidable.
- Earthworks (cut and fill) to create the trail form. This will be undertaken with a mini-excavator.
- Importation of some decomposed granite for the track surface.
- Two small platforms to minimise impacts on minor watercourses.

The proposal is further identified in **Figure 3** and **Photos 1 – 7**.

Photo 1: The proposed trail will traverse a mix of disturbed ski slopes and remnant tree islands in the Upper Cruiser area.

Photo 2: The tree islands that the trail will traverse are characterised by low shrub cover and widely spaced trees such that it will not be necessary to remove any trees, with the exception of some saplings, for the construction of the trail.

Photo 3: The trail will traverse a mix of disturbed ski slopes and remnant tree islands before joining the Cruiser Chairlift access road.

Photo 4: The trail will follow the Cruiser Chairlift access road disturbance corridor for approximately 150 m.

Photo 5: The trail traverses a disturbed ski slope and an area of heath before returning to the ski slope.

Photo 6:The trail descends through disturbed ski slopes and some remnant vegetation on the edge of the ski slopes before joining the access road to the Gunbarrel Chairlift.

Photo 7: The final part of the trail uses the Gunbarrel Chairlift access road before it joins the All Mountain Trail.

1.3. Development site footprint

It is anticipated that the proposed development will result in the removal or further modification of 0.2 ha of native vegetation, approximately half of which is already highly modified. Approximately 0.15 ha of exotic grassland will also be disturbed in association with the proposed trail.

The development site footprint is identified in Figure 2. The proposal is identified in Figure 3.

1.4. Sources of information used

The following data sources were reviewed as part of this report:

- BioNet Vegetation Classification
- BioNet Atlas Database
- Threatened Biodiversity Data Collection
- Additional GIS datasets including cadastre, contours, imagery and drainage.

1.5. Legislative context

Legislation relevant to the development site is outlined in Table 1.

Table 1: Legislative context

Name	Relevance to the project	Report Section
Commonwealth		
Environment Protection and Biodiversity Conservation Act 1999	Matters of national Environmental Significance (MNES) have been identified on or near the development site. This report assesses impacts to MNES and concludes that the development is unlikely to have a significant impact on MNES.	**Appendix D**
State		
Environmental Planning and Assessment Act 1979	The proposed development requires consent and is to be assessed under Part 4 of the EP&A Act. The EP&A 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.	-
Biodiversity Conservation Act 2016	The proposed development involves clearing of vegetation identified as high conservation value on the Biodiversity Values Land Map and thus requires submission of a Biodiversity Development Assessment Report.	-
Environmental Planning Instruments		
SEPP Alpine Resorts - Kosciuszko National Park—Alpine Resorts	State Environmental Planning Policy (Kosciuszko National Park—Alpine Resorts) 2007 (SEPP 73) identified the Minister for Planning as the determining authority for development within the NSW Alpine Resorts. SEPP 73 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 Planning, Industry and Environment (DPIE).	-
Snowy River Shire Local Environment Plan 2013	The subject site is zoned E1 National Parks and Nature Reserves under the Snowy River Shire Local Environment Plan 2013.	-

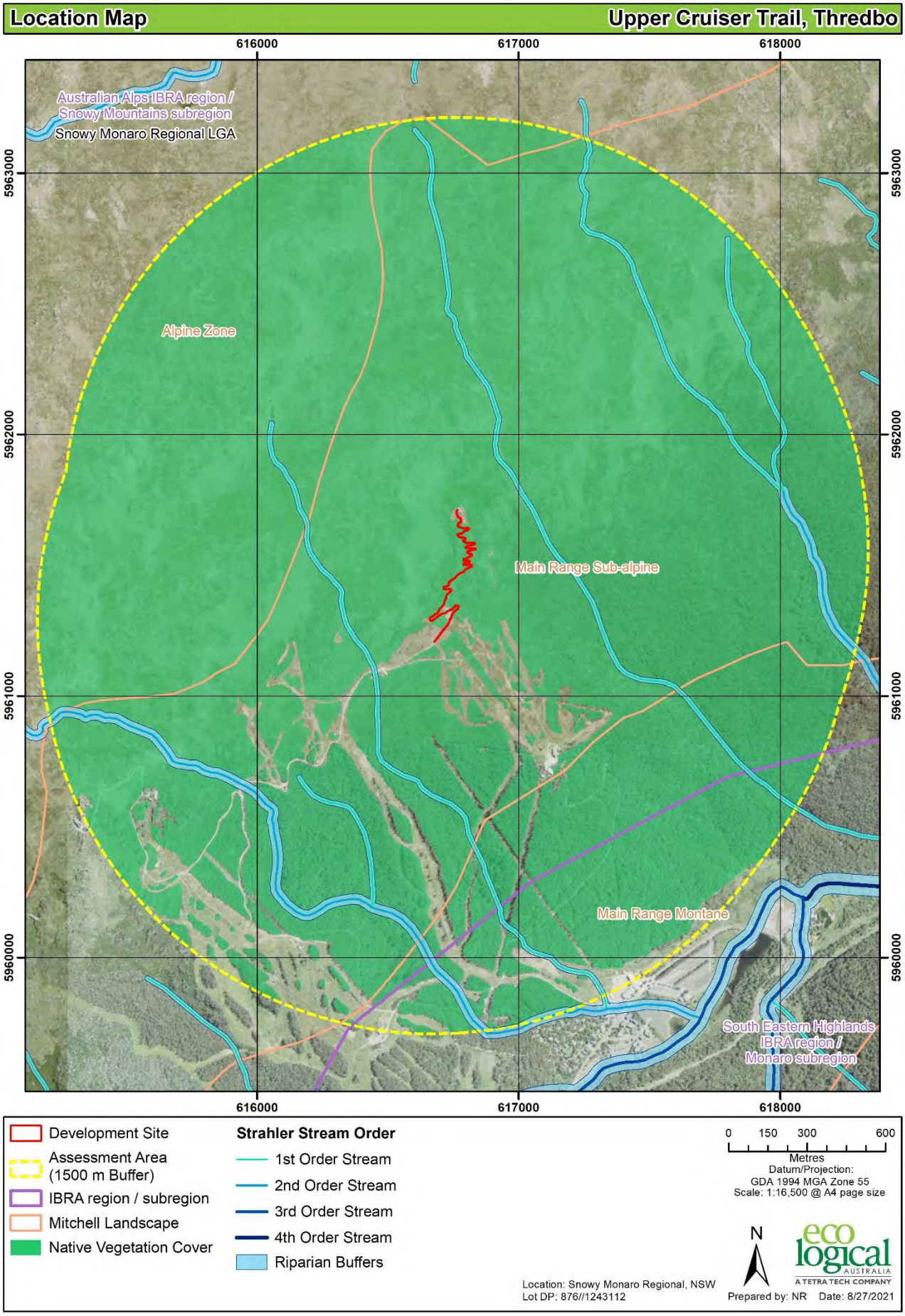


Figure 1: Location Map

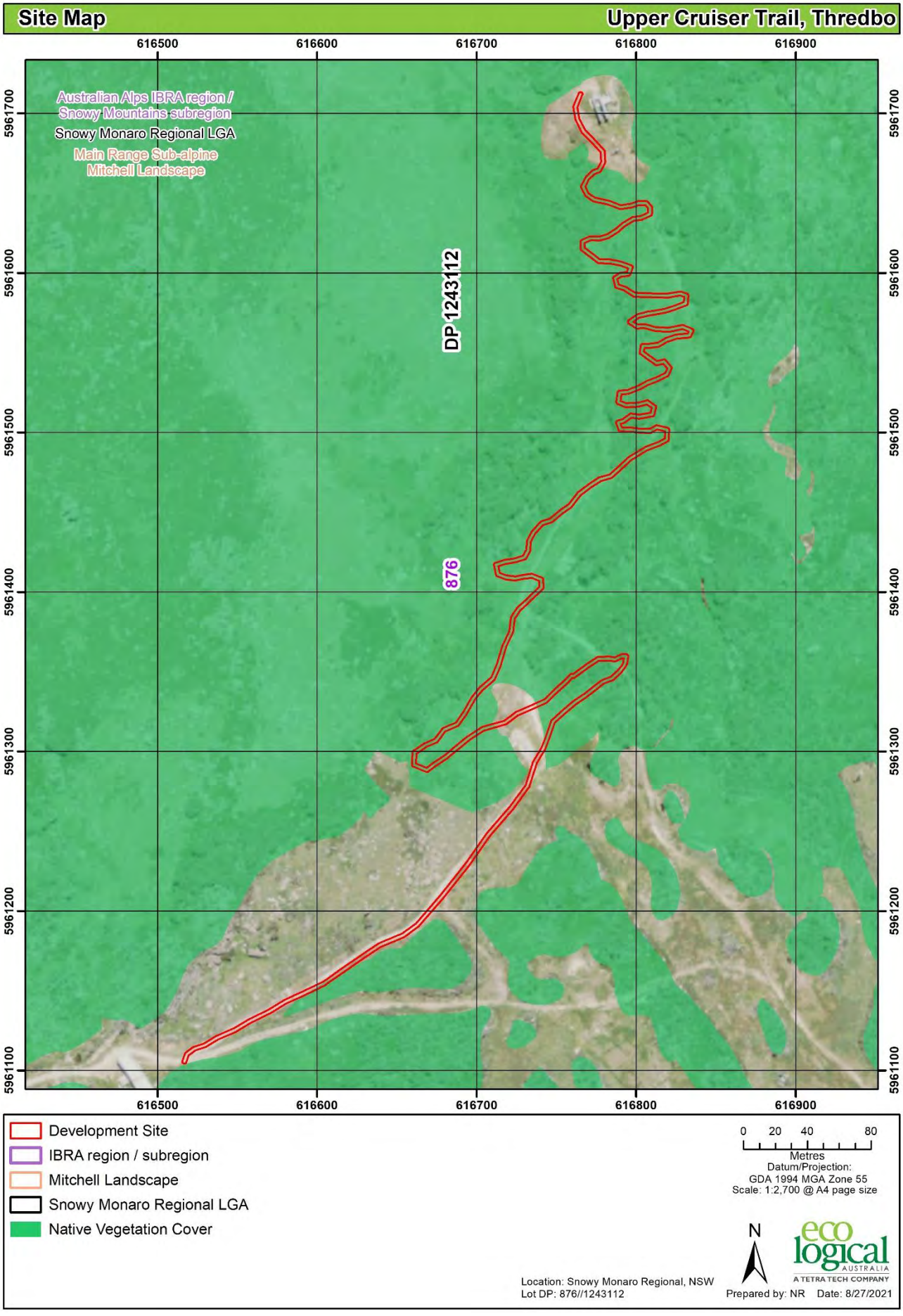


Figure 2: Site Map

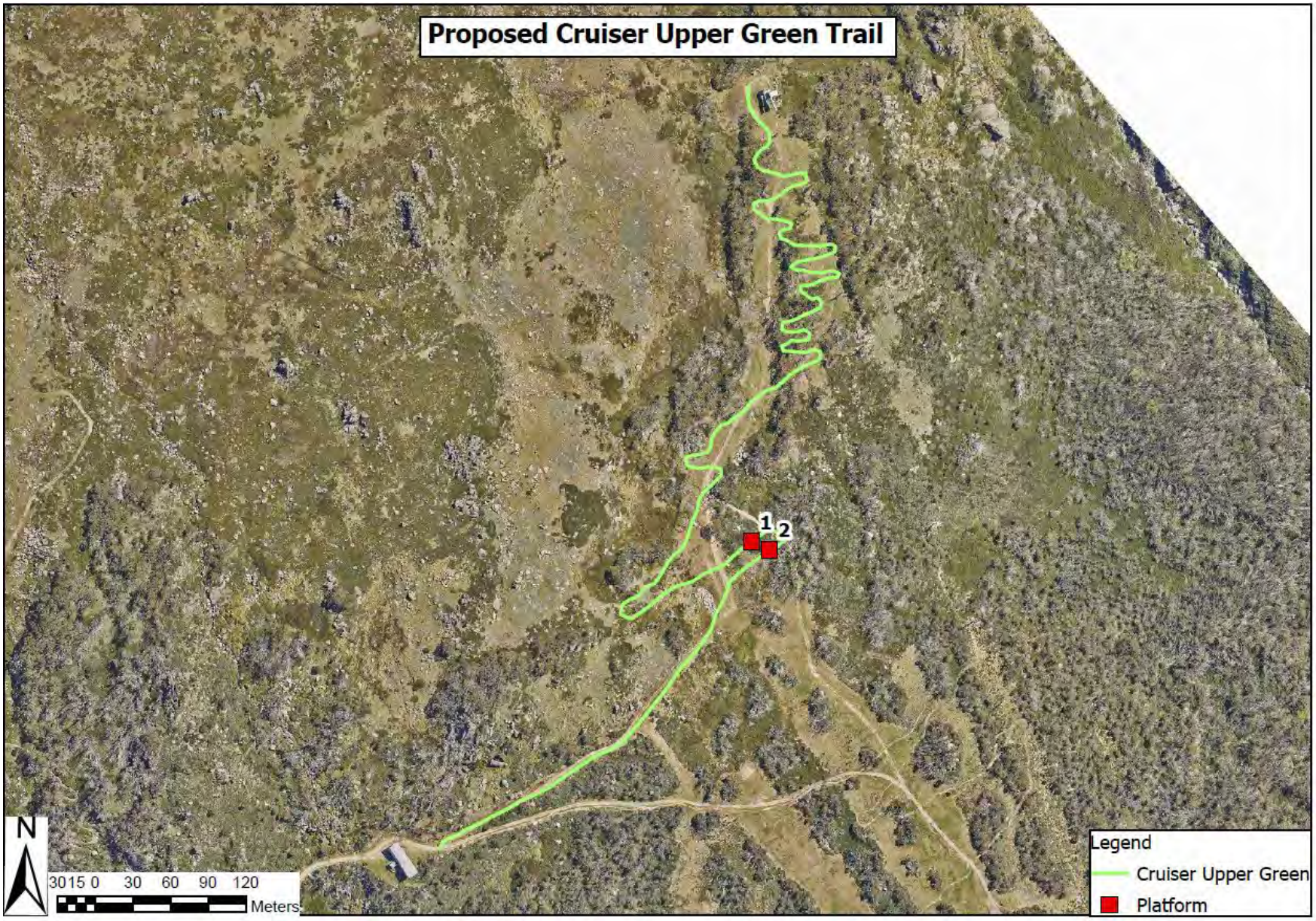


Figure 3: The proposal

2. Landscape features

The site-based method was applied for this assessment. As such, the assessment area is the 1,500 m buffer surrounding the outside edge of the development footprint.

The landscape features considered for this assessment are presented in **Table 2**, **Figure 1** and **Figure 2**.

Table 2: Landscape features

Landscape feature	Development Site	Assessment Area	Data source
IBRA Region(s)	Australian Alps	Australian Alps	Interim Biogeographic Regionalisation for Australia, Version 7
IBRA subregion(s)	Snowy Mountains	Snowy Mountains	Interim Biogeographic Regionalisation for Australia, Version 7
Rivers and streams	No	No	NSW LPI Waterway mapping
Estuaries and wetlands	No	N0	NSW directory of important wetlands
Connectivity of different areas of habitat	The development site is connected to vast areas of native vegetation.	-	Aerial imagery
Geological features of significance and soil hazard features	The rock outcropping in the development site is very typical of the locality and not of any particular geological significance.	-.	Site observation
Areas of Outstanding Biodiversity Value	No	No	Register of Declared Areas of Outstanding Biodiversity Value (DPIE 2020)
NSW (Mitchell) Landscapes	Main Range Subalpine	Main Range Subalpine	NSW (Mitchell) Landscapes - version 3.1 (DPIE 2016)
Percent (%) native vegetation extent	92	There are no substantial differences between the mapped vegetation extent and the aerial imagery	Calculated using aerial imagery and ArcGIS software

3. Native Vegetation

3.1. Survey Effort

Vegetation survey was undertaken within the development site by Ryan Smithers on 30 March 2021 (Figure 4).

A total of three full-floristic vegetation plots were surveyed to identify Plant Community Types (PCTs) and Threatened Ecological Communities (TECs) on the development site (**Table 3**). A total of three vegetation integrity survey plots were undertaken on the development site to assess the composition, structure and function components of each vegetation zone in accordance with the BAM.

All field data collected at full-floristic and vegetation integrity plots is included in **Appendix B** and **Appendix C**.

Table 3: Full-floristic PCT identification plots

PCT ID	PCT Name	Number of plots surveyed
645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	3

3.2. Native vegetation extent within the development site

There are no substantial differences between the extent of native vegetation within the development site as identified in recent aerial imagery and that identified during the vegetation survey.

3.3. Plant Community Types present

One PCT was identified within the development site as shown in Table 3. Further detail with respect to the PCT identified within the development site is presented in **Table 4**, and their distribution identified in **Figure 4**.

Table 4: Plant Community Types

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Area within the development site (ha)	Percent cleared
645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Subalpine Woodlands	Grassy Woodland	0.2	5

3.3.1. Plant Community Type selection justification

In determining the PCT for the development site, various attributes were considered in combination to assign vegetation to the best fit PCT. Attributes included dominant species in each stratum and relative abundance, community composition, soils and landscape position. Reference was made to the PCT descriptions in the BioNet Vegetation Classification. There are only a small number of PCTs in the alpine and sub alpine so there are very few PCT options as shown in **Table 5**.

Table 5: Potential PCTs

Selected PCT ID	PCT Name	Other PCT options
645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	643

3.4. Threatened Ecological Communities

PCT 645 does not comprise any TEC which is listed on the BC Act or EPBC Act, as identified in **Table 6**..

Table 6: Threatened Ecological Communities

PCT ID	BC Act			EPBC Act		
	Listing status	Name	Area (ha)	Listing status	Name	Area (ha)
645	Not listed	-	-	645	Not listed	-

3.5. Vegetation integrity assessment

3.5.1. Vegetation zones

Three vegetation zones were identified within the development site based on the broad condition states of PCT 645, as shown in Figure 5. A total of three vegetation integrity survey plots were collected on the development site, which is consistent with the BAM (**Table 7**). Descriptions of vegetation zones are provided in Table 8, Table 9 and Table 10.

Table 7: Vegetation zones and vegetation integrity survey plots collected on the development site

Vegetation Zone	PCT ID	PCT Name	Condition	Area (ha)	Patch Size	Vegetation Integrity Survey Plots required	Vegetation Integrity Survey Plots collected
1	645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Good	0.06	101	1	1
2	645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Moderate	0.04	101	1	1
3	645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Poor	0.1	101	1	1
			Total	0.2		3	3

3.5.2. Patch size

Patch size was calculated using available vegetation mapping for all patches of intact native vegetation on and adjoining the development site. Patch size was assigned to one of four classes (<5 ha, 5-24 ha, 25-100 ha or ≥100 ha). A patch size ≥100 ha was determined for the development site.

3.5.3. Assessing vegetation integrity

A vegetation integrity assessment using the BAM Calculator (BAMC) was undertaken and the results are outlined in **Table 11**.

Table 8: Zone 1 PCT 645 Good Condition

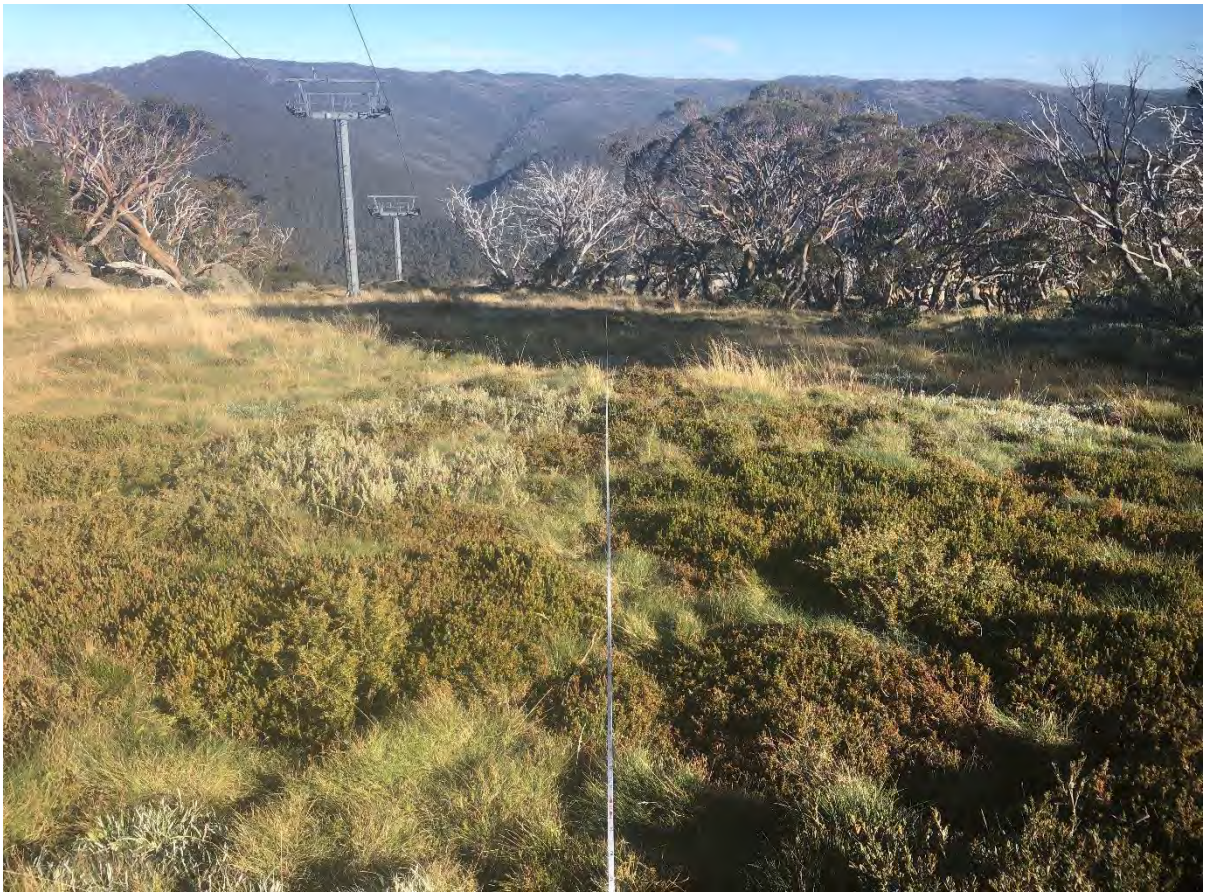
645 - Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion			
Vegetation formation	Grassy Woodlands		
Vegetation Class	Subalpine Woodlands		
Conservation status	Widespread and well conserved. Not listed as a TEC on the BC Act or EPBC Act		
Description	This community is common in the locality but highly variable. It is poorly described by the current PCTs and associated benchmarks which don't well describe the variety of vegetation communities covered by PCT 645 and the variation in composition and structure values within "benchmark" occurrences.		
Characteristic canopy trees	*Eucalyptus niphophila*.		
Characteristic mid-storey	*Grevillea australis, Ozothamnus cupressoides*, *Prostanthera cuneata, Nematolepis ovatifolia, Ozothamnus secundiflorus, Ozothamnus alpinus, Olearia phlogopappa, Orites lancifolius, Oxylobium ellipticum.*		
Characteristic groundcovers	*Acaena novae-zelandiae , Asperula gunnii , Carex breviculmis, Lycopodium fastigiatum, Pimelea alpina, Poa fawcettiae, Polystichum proliferum, Senecio gunnii.*		
Mean native richness	19		
Exotic species / HTW cover	*Acetosella vulgaris*		
Condition	Good condition		
Variation and disturbance	PCT 645 is in good condition within the zone with minor variations in shrub cover. It is characterised by old Snow Gums		
No. sites sampled	1		
Threatened flora species	-		
Fauna habitats	Broad-toothed Rat and Flame Robin.		
Composition	**Structure**	**Function**	**Vegetation Integrity Score**
50	85.4	93.6	73.6

Table 9: Zone 2 PCT 645 Moderate Condition

645 - Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion			
Vegetation formation	Grassy Woodlands		
Vegetation Class	Subalpine Woodlands		
Conservation status	Widespread and well conserved. Not listed as a TEC on the BC Act or EPBC Act		
Description	This community is common in the locality but highly variable. It is poorly described by the current PCTs and associated benchmarks which don't well describe the variety of vegetation communities covered by PCT 645 and the variation in composition and structure values within "benchmark" occurrences.		
Characteristic canopy trees	*Eucalyptus niphophila*.		
Characteristic mid-storey	*Grevillea australis, Ozothamnus cupressoides*, *Prostanthera cuneata, Nematolepis ovatifolia, Ozothamnus secundiflorus, Ozothamnus alpinus, Olearia phlogopappa, Orites lancifolius, Oxylobium ellipticum.*		
Characteristic groundcovers	*Acaena novae-zelandiae, Asperula gunnii, Carex breviculmis, Lycopodium fastigiatum, Pimelea alpina, Poa fawcettiae, Polystichum proliferum, Senecio gunnii.*		
Mean native richness	21		
Exotic species / HTW cover	*Acetosella vulgaris*		
Condition	Moderate condition		
Variation and disturbance	PCT 645 is in moderate condition within the zone but has been affected by historic and ongoing tree removal and pruning for ski slope management.		
No. sites sampled	1		
Threatened flora species	-		
Fauna habitats	Broad-toothed Rat and Flame Robin.		
Composition	**Structure**	**Function**	**Vegetation Integrity Score**
86.4	69.3	31.3	57.2

Table 10: Zone 3 PCT 645 Poor Condition

645 - Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion			
Vegetation formation	Grassy Woodlands		
Vegetation Class	Subalpine Woodlands		
Conservation status	Widespread and well conserved. Not listed as a TEC on the BC Act or EPBC Act		
Description	This community is common in the locality but highly variable. It is poorly described by the current PCTs and associated benchmarks which don't well describe the variety of vegetation communities covered by PCT 645 and the variation in composition and structure values within "benchmark" occurrences.		
Characteristic canopy trees	*Eucalyptus niphophila*.		
Characteristic mid-storey	*Grevillea australis, Ozothamnus cupressoides, Prostanthera cuneata, Nematolepis ovatifolia, Ozothamnus secundiflorus, Ozothamnus alpinus, Olearia phlogopappa, Orites lancifolius, Oxylobium ellipticum.*		
Characteristic groundcovers	*Acaena novae-zelandiae, Asperula gunnii, Carex breviculmis, Lycopodium fastigiatum, Pimelea alpina, Poa fawcettiae, Polystichum proliferum, Senecio gunnii.*		
Mean native richness	33		
Exotic species / HTW cover	*Acetosella vulgaris, Agrostis capillaris*		
Condition	Poor condition		
Variation and disturbance	PCT 645 is in poor condition within the zone and has been affected by historic and ongoing tree removal and pruning for ski slopes management and other disturbances which have resulted in considerable exotic grass cover.		
No. sites sampled	1		
Threatened flora species	-		
Fauna habitats	Broad-toothed Rat and Flame Robin.		
Composition	**Structure**	**Function**	**Vegetation Integrity Score**
65.1	79.5	15.4	43.1



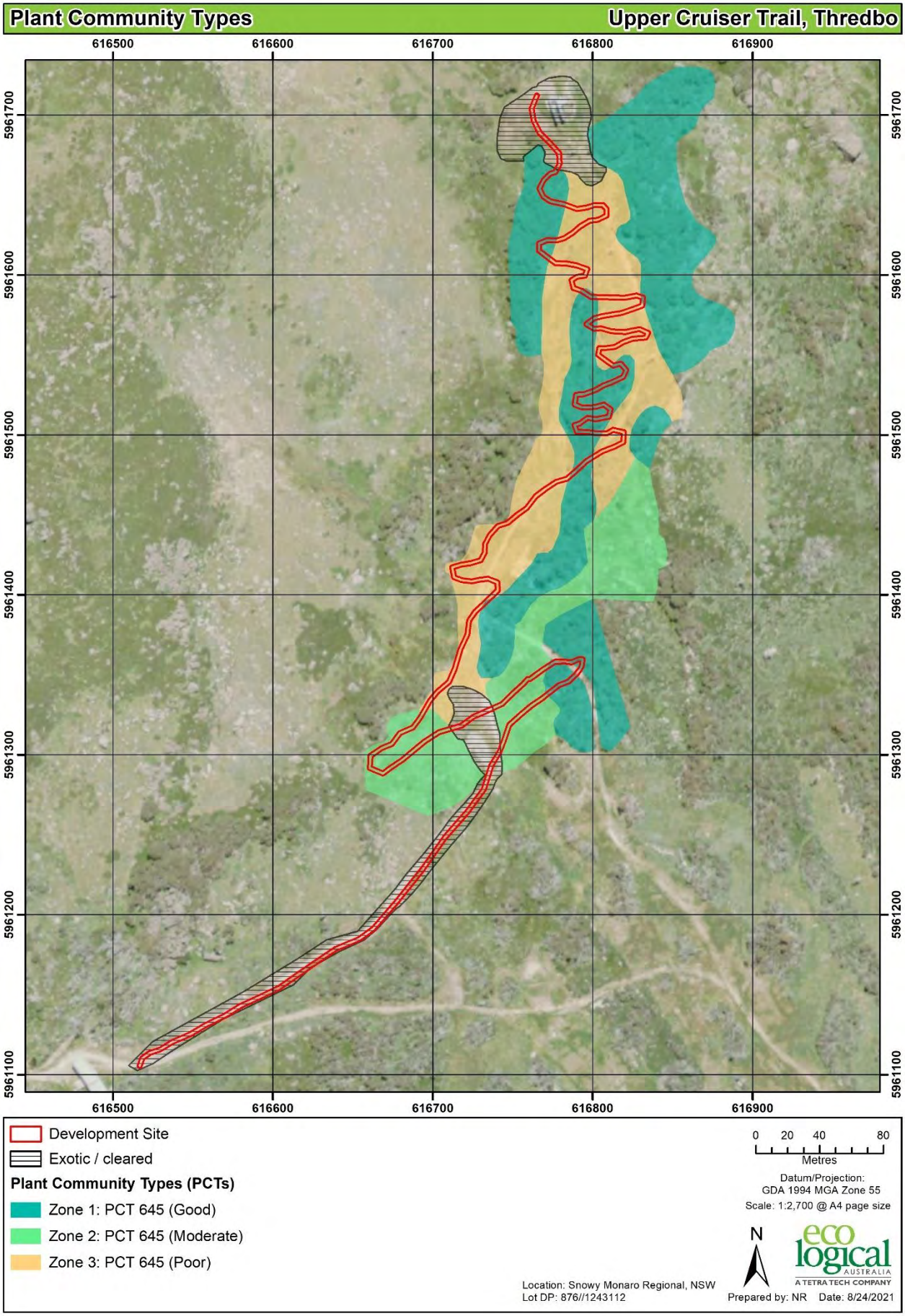


Figure 4: Plant Community Types

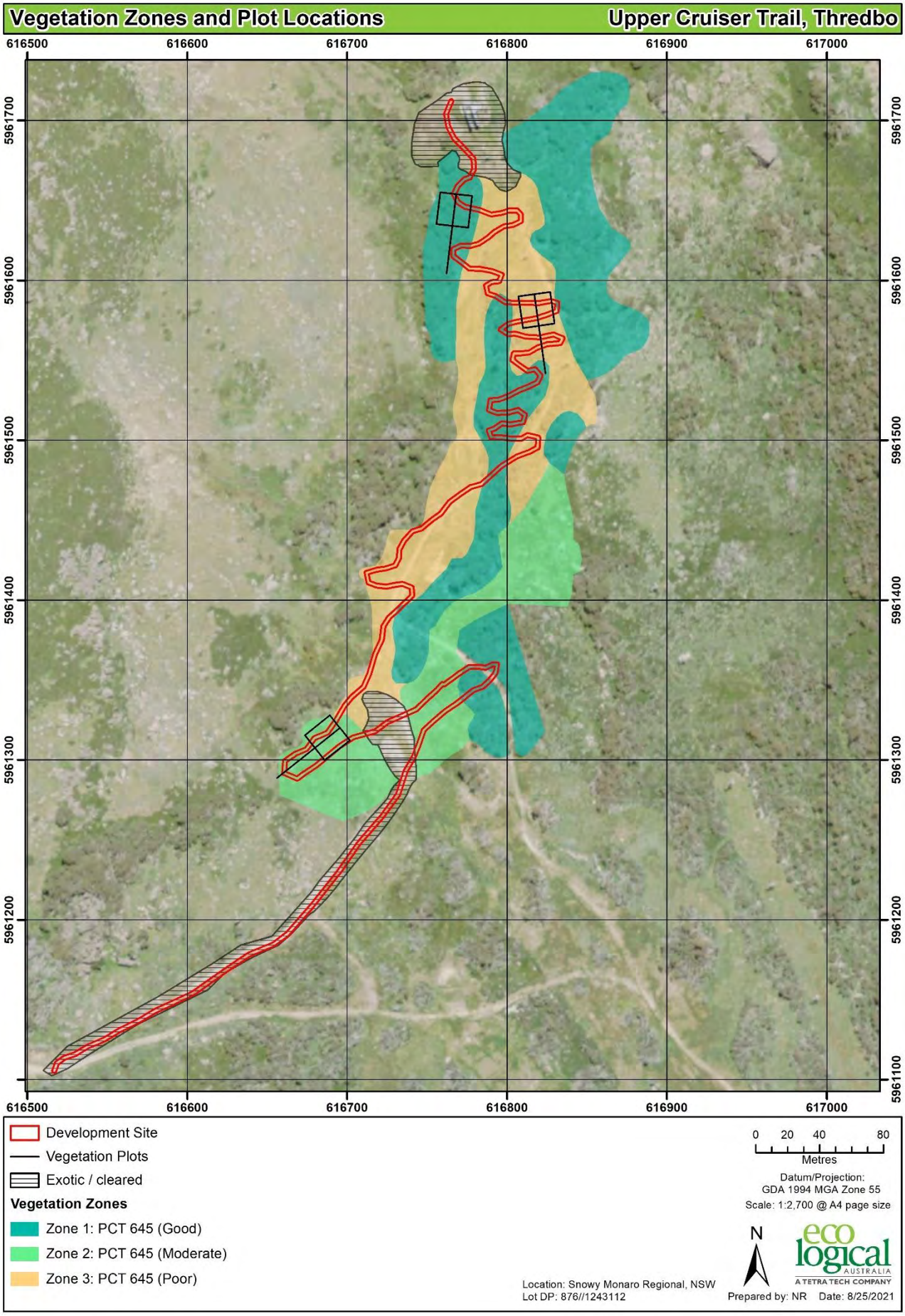


Figure 5: Vegetation Zones and Plots

Table 11: Vegetation integrity scores

Veg Zone	PCT ID	Condition	Area (ha)	Composition Condition Score	Structure Condition Score	Function Condition Score	Presence of Hollow bearing trees	Current vegetation integrity score
1	645	Good	0.06	50	85.4	93.6	Yes	73.6
2	645	Moderate	0.04	86.4	69.3	31.3	No	57.2
3	645	Poor	0.1	65.1	79.5	15.4	No	43.1

3.6. Use of local data

Use of local data instead of benchmark integrity scores is not proposed.

4. Threatened species

4.1. Ecosystem credit species

Ecosystem credit species predicted to occur within the development site are generated by the BAMC following the input of VI data and the PCTs identified within **Chapter 3**. Ecosystem credit species predicted to occur at the development site, their associated habitat constraints, geographic limitations and sensitivity to gain class are included in Table 12.

Table 12: Predicted ecosystem credit species

Species	Common Name	Habitat Constraints	Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status
Artamus cyanopterus cyanopterus	Dusky Woodswallow	-	-	Moderate	Vulnerable	Not Listed
Callocephalon fimbriatum (foraging)	Gang-gang Cockatoo	-	-	Moderate	Vulnerable	Not Listed
Daphoenositta chrysoptera	Varied Sittella	-	-	Moderate	Vulnerable	Not Listed
Falsistrellus tasmaniensis	Eastern False Pipistrelle	-	-	High	Vulnerable	Not Listed
Hieraaetus morphnoides (Foraging)	Little Eagle	-	-	Moderate	Vulnerable	Not Listed
Hirundapus caudacutus	White-throated Needletail	-	-	High	Not Listed	Vulnerable
Petroica boodang	Scarlet Robin	-	-	Moderate	Vulnerable	Not Listed
Petroica phoenicea	Flame Robin	-	-	Moderate	Vulnerable	Not Listed

4.2. Species credit species

4.2.1. Identification of species credit species

Species credit species that require further assessment within the development site (i.e. candidate species), their associated habitat constraints, geographic limitations and sensitivity to gain class are included in Table 13.

Table 13: Candidate species credit species

Species	Common Name	Habitat Constraints	Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status
Broad-toothed Rat	*Mastacomys fuscus*	-	-	High	Vulnerable	Vulnerable
Southern Corroboree Frog	*Pseudophryne corroboree*	NA/Swamps Within 200 m of high montane and sub-alpine bog or ephemeral pool environments	above 1000 m asl	Very High	Critically Endangered	Critically Endangered

4.2.2. Assessment of habitat constraints and vagrant species

Justification for the exclusion of other candidate species credit species is provided in Table 14.

Table 14: Justification for exclusion of candidate species credit species

Species	Common Name	NSW listing status	EPBC Listing status	Sensitivity to gain class	Justification for exclusion of species
Southern Corroboree Frog	*Pseudophryne corroboree*	Critically Endangered	Critically Endangered	Very High	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. It is considered highly unlikely that it would occur within the development site and it was not detected there opportunistically.

4.2.3. Candidate species requiring further assessment

The only species credit species that requires further assessment following site survey to assess the condition of the development site and the presence of microhabitats is *Mastacomys fuscus* (Broad-toothed Rat).

4.3. Targeted surveys

The streamlined assessment method only requires targeted surveys for candidate SAII species. The development site does not meet the habitat constraints of any of the candidate species credit species that are candidate SAII species. None of the candidate species credit species were incidentally recorded within the development site or immediate surrounds.

Targeted surveys for relevant threatened species known from locality the were undertaken within the development site and immediate surrounds on the dates outlined in Table 15. Weather conditions during the targeted surveys are outlined in Table 16 and survey effort is outlined in Table 17.

Table 15: Targeted surveys

Date	Surveyors	Target species
11 March 2021	Ryan Smithers	Guthega Skink and Broad-toothed Rat
12 March 2021	Ryan Smithers	Guthega Skink and Broad-toothed Rat
31 March 2021	Ryan Smithers	Guthega Skink, Broad-toothed Rat and Anenome Buttercup

Table 16: Weather conditions

Date	Rainfall (mm)	Minimum temperature 0^C	Maximum temperature 0^C
11 March 2020	-	12	14
12 March 2020	-	12	15
31 March 2021	-	8	13

Table 17: Survey effort

Method	Habitat (ha)	Stratification units	Total effort	Target species
Target Searches	Approx. 2 ha	Suitable habitats within and immediately surrounding the development site	4 person hours	Guthega Skink and Broad-toothed Rat
Targeted threatened flora searches	0.2	Suitable habitats within and immediately surrounding the development site	1 person hour	Anenome Buttercup

The targeted surveys resulted in the detection of one species credit species, the Broad-toothed Rat. The characteristic scats of the Broad-toothed Rat were scattered in low densities throughout the development site and surrounds, as they are in suitable habitats throughout much of the locality.

The Guthega Skink was not detected within the development site or immediate surrounds despite targeted surveys. The nearest records of the Guthega Skink are approximately 1.6 km to the west, in the Ramshead Range. It is considered unlikely that the species would occur within the development site, given that the species was not detected, despite targeted surveys for this assessment, and has not been detected nearby, despite considerable survey effort by the author over that last decade in and around the Cruiser area.

Targeted surveys were not undertaken for the Southern Corroboree Frog given the absence of suitable habitats for the species, including suitable bog breeding habitat.

Following completion of field surveys, the species credit species included in the assessment are outlined in Table 18.

Table 18: Species credit species included in the assessment

Species	Common Name	Species presence	Geographic limitations	Habitat (ha)	Biodiversity Risk Weighting
Broad-toothed Rat	*Mastacomys fuscus*	Yes	-	0.36	2

4.3.1. Species credit species included in the assessment

One species credit species, the Broad-toothed Rat, has been included in the assessment as the proposed development will impact on habitat for the species. A species polygon for the Broad-toothed Rat is included as **Figure 6**.

4.4. Identification of prescribed additional biodiversity impact entities

The proposed development does not include any prescribed additional biodiversity impact entities.

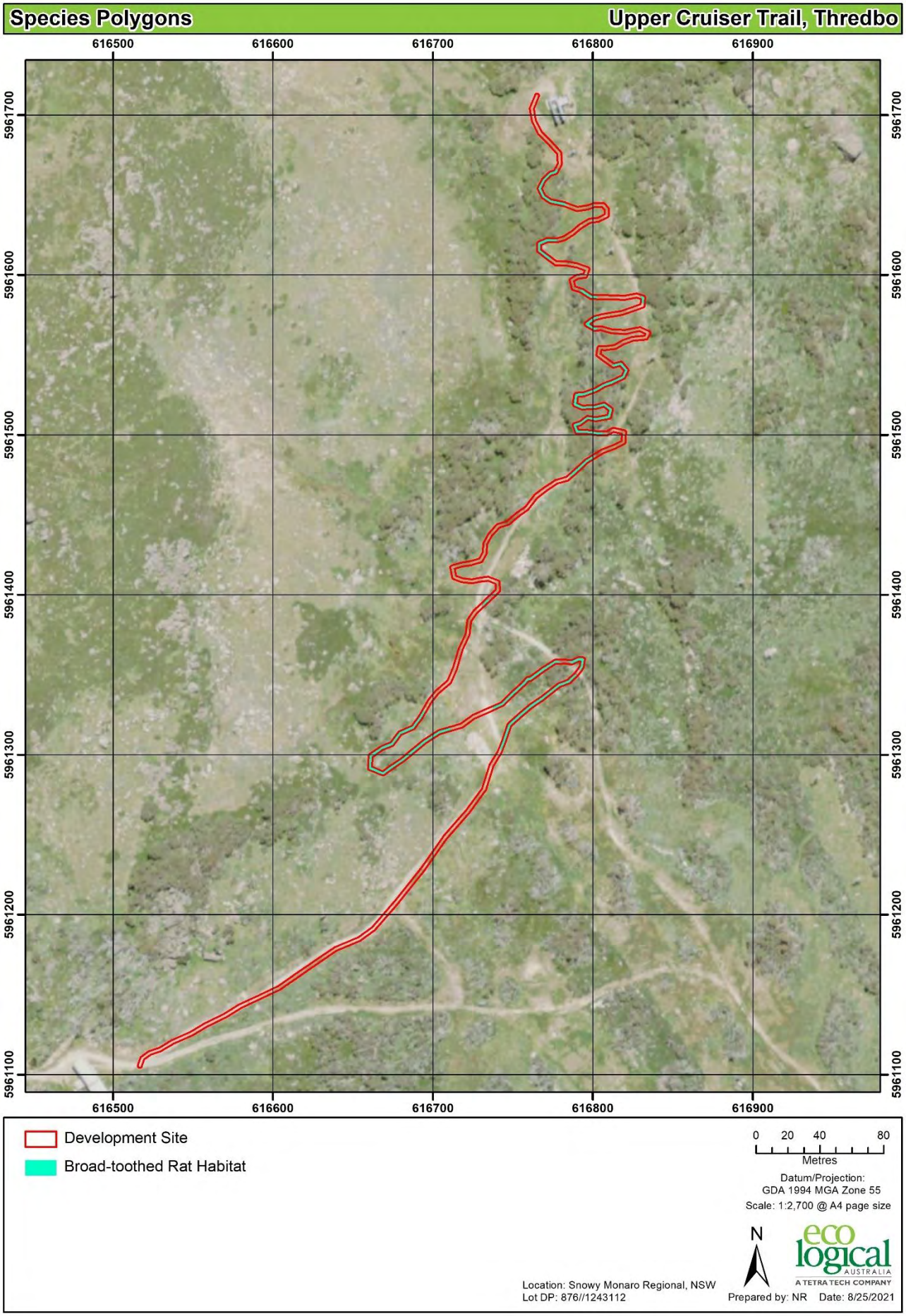


Figure 6: Species polygons

5. Avoiding and Minimising Impacts on Biodiversity Values

5.1. Locating a project to avoid and minimise impacts on biodiversity values

5.1.1. Direct and indirect impacts

The proposal has been designed to avoid and minimise direct and indirect impacts. In particular, this has involved:

- Locating the proposed trail predominately in disturbed areas and non-native vegetation.
- Minimising the disturbance footprint associated with construction.
- Changing the location of the trail to avoid wet areas.
- Using platforms to traverse minor watercourses.
- Designing and constructing the trail to avoid the need for mature tree removal.
- Using low impact construction methods.
- Undertaking post construction rehabilitation.

5.1.2. Prescribed biodiversity impacts

The proposal does not involve any prescribed biodiversity impacts.

5.2. Designing a project to avoid and minimise impacts on biodiversity values

5.2.1. Direct and indirect impacts

The proposal has been designed to avoid and minimise direct and indirect impacts on biodiversity values as described in **Section 5.1.1**.

5.2.2. Prescribed biodiversity impacts

Prescribed biodiversity impacts have been avoided and minimised by incorporating the design features identified in **Section 5.1.1**.

6. Assessment of Impacts

6.1. Direct impacts

The direct impacts of the development on:

- Native vegetation are outlined in **Table 19**.
- Threatened species and threatened species habitat is outlined in **Table 20**.
- Prescribed biodiversity impacts is outlined in **Section 6.4**.

Table 19: Direct impacts to native vegetation

PCT ID	PCT Name	BC Act listing	EPBC Act listing	Direct impact (ha)
645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Not listed	Not Listed	0.2

Table 20: Direct impacts on threatened species and threatened species habitat

Species	Common Name	Direct impact number of individuals / habitat (ha)	BC Act listing status	EPBC Act Listing status
Mastacomys fuscus	Broad-toothed Rat	0.1	Vulnerable	Vulnerable

6.2. Change in vegetation integrity

The change in vegetation integrity as a result of the development is outlined in **Table 21**. The future integrity score has been adjusted to acknowledge that the canopy will not be removed in Zone 1.

Table 21: Change in vegetation integrity

Veg Zone	PCT ID	Condition	Area (ha)	Current vegetation integrity score	Future vegetation integrity score	Change in vegetation integrity
1	645	Good	0.06	73.6	13.6	-60
2	645	Moderate	0.04	57.2	0	-57.2
3	645	Poor	0.1	43.1	0	-43.1

6.3. Indirect impacts

The indirect impacts of the development are outlined in **Table 22**. Given the nature of the proposed development, and the proposed mitigation measures, indirect impacts (in the form of increased light and wind penetration) are only anticipated to extend a maximum of 2 m into vegetation surrounding the proposed development site. Indirect impact zones are shown on **Figure 7**.

6.4. Prescribed biodiversity impacts

The proposal does not involve any prescribed biodiversity impact.

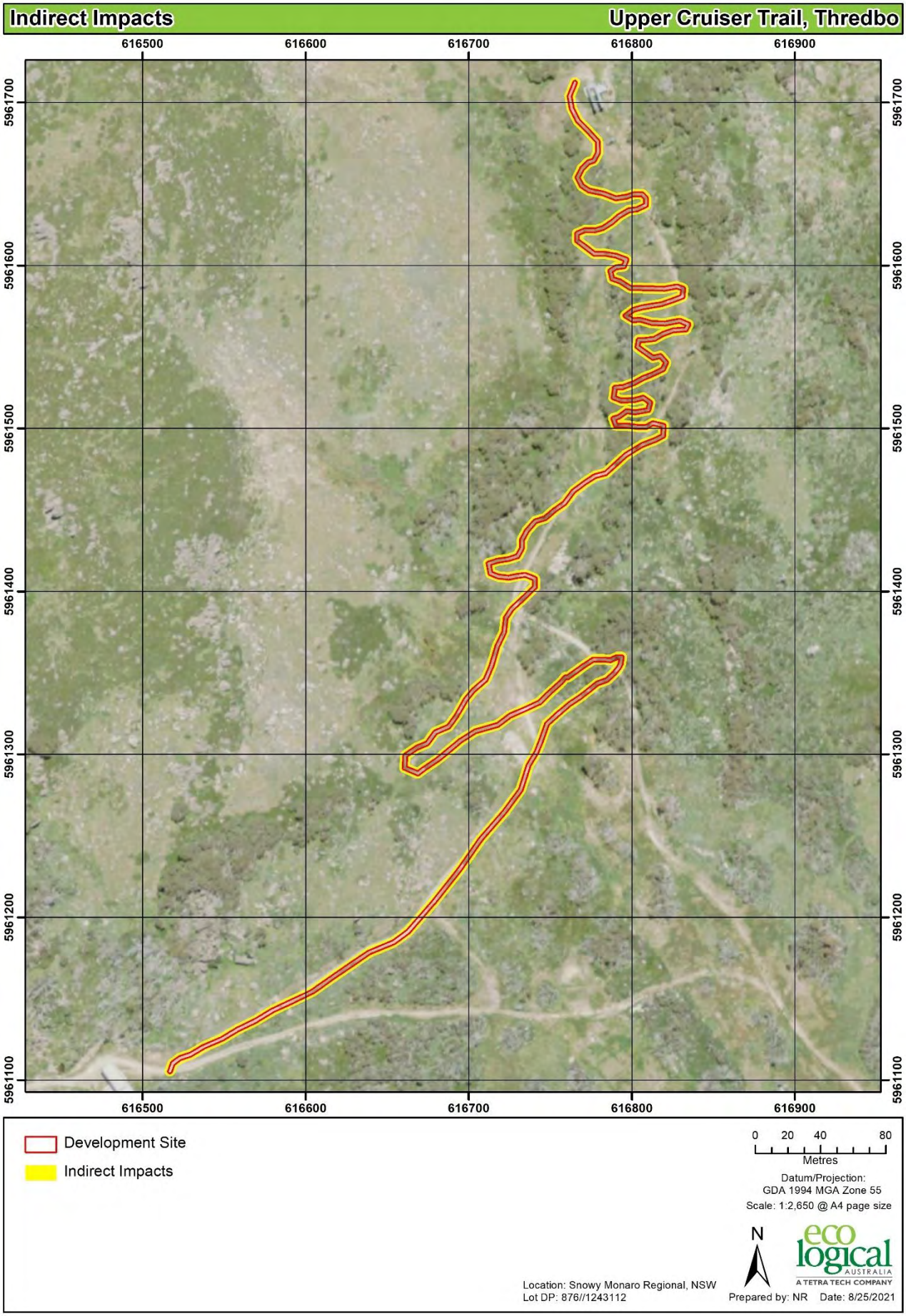


Figure 7: Indirect impact zones

Table 22: Indirect impacts

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
Sedimentation and contaminated and/or nutrient rich run-off	Construction and post construction	Minor potential for sedimentation during and immediately post-construction. However, the proposed sediment control measures have been effective during the many other similar developments that have been undertaken within the alpine resorts in recent years.	Minor	During and after any heavy rainfall	12 month maximum	Intermittently during and post construction phase
Noise, dust or light spill	Construction	Minor during construction.	Minor	Intermittently during construction phase	3 months	Intermittently during construction phase
Inadvertent impacts on adjacent habitat or vegetation	Construction	Minor. The construction methods used at Thredbo have been effective at preventing impacts on adjacent vegetation during the many other similar developments that have been undertaken in recent years.	Minor	Not expected but possible	During construction	Not expected
Transport of weeds and pathogens from the site to adjacent vegetation	Construction	Not expected. The development site includes and abuts areas that are already heavily modified and which support weeds which are common within the Thredbo Resort area and elsewhere within the NSW Alps. The proposal will include post construction rehabilitation and weed control.	Not expected	Not expected but possible	Not expected	Not expected
Vehicle strike	Construction	Minor. It is considered unlikely that the proposal will include vehicle strike impacts. Vehicles will be travelling at very slow speeds within the development site and the noise and vibration associated with vehicle movements is expected to deter any fauna within or adjoining the development site from the path of any vehicles.	Not expected	Not expected but possible	6 months	Not expected
Trampling of threatened flora species	Construction	Minor. There are no threatened flora species within the development site.	Minor	Not expected	6 months	Not expected
Rubbish dumping	Construction	Not expected. Construction materials will be removed from the site regularly and no rubbish will be dumped or otherwise left to pollute the surrounding environment.	Not expected	Not expected	Not expected	Not expected
Wood collection	Construction	Not expected	Not expected	Not expected	Not expected	Not expected

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
Bush rock removal and disturbance	Construction	Minor. A relatively small amount of rock will be removed as part of the development. No additional indirect impacts are expected.	Minor	Intermittently during construction phase	During construction	Intermittently during construction phase
Increase in predatory species populations	Construction and post construction	Not expected. The proposed development occurs on the edge of an already disturbed area and will not increase the populations of predatory species such as foxes and cats.	Not expected	Not expected	Not expected	Not expected
Increase in pest animal populations	Construction and post construction	Not expected	Not expected	Not expected	Not expected	Not expected
Increased risk of fire	Construction	Minor potential for increased risk of fire during construction.	Minor	Intermittently during construction phase	6 months	Intermittently during construction phase
Disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds	Construction and post construction	Not expected as none are known to be present.	Not expected	Not expected	Not expected	Not expected

6.5. Mitigating and managing direct and indirect impacts

Measures proposed to mitigate and manage impacts at the development site before, during and after construction are outlined in **Table 23**.

6.6. Mitigating prescribed impacts

The development does not have any prescribed biodiversity impacts.

6.7. Adaptive management strategy

This section is required for those impacts that are infrequent, cumulative or difficult to predict. Impacts associated with the proposed development have been considered extensively and addressed in **Section 5** and **Section 6**. Further consideration of infrequent, cumulative or difficult to predict impacts is not considered to be necessary.

Table 23: Measures proposed to mitigate and manage impacts

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Displacement of resident fauna	Medium	Low	If any active wombat burrows are detected in close proximity to the trail alignment during the construction phase, then the trail should be realigned to avoid the burrow.	Fauna within the disturbance footprint should move and thus any injury to fauna species during construction should be avoided	During construction	Thredbo
Timing works to avoid critical life cycle events such as breeding or nursing	Low	Low	None proposed.	NA	NA	NA
Instigating clearing protocols including pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecologist or licensed wildlife handler during clearing events	Low	Low	None proposed	NA	NA	NA
Clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance; for example, removal of native vegetation by chainsaw, rather than heavy machinery, is preferable in situations where partial clearing is proposed	Medium	Low	Identify with flagging tape trail alignment, where it encroaches upon relatively undisturbed native vegetation, prior to construction	Risk of disturbance beyond proposed disturbance corridor is reduced	Prior to construction	Thredbo
Sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment	Medium	Low	Sediment control measures as necessary such as fencing and hay bales	Risk of sedimentation of water quality impacts substantially reduced	During and post-construction	Thredbo
Noise barriers or daily/seasonal timing of construction and operational activities to reduce impacts of noise	Low	Low	Restrict work to daylight hours	Noise impacts mitigated	During construction	Thredbo
Light shields or daily/seasonal timing of construction and operational activities to reduce impacts of light spill	Low	Low	Restrict work to daylight hours	Light impacts mitigated	During construction	Thredbo
Adaptive dust monitoring programs to control air quality	Low	Low	None proposed	NA	NA	NA

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Programming construction activities to avoid impacts; for example, timing construction activities for when migratory species are absent from the site, or when particular species known to or likely to use the habitat on the site are not breeding or nesting	Low	Low	None proposed	NA	NA	NA
Temporary fencing to protect significant environmental features such as riparian zones	Low	Low	The trail alignment will be delineated with flagging tape where it encroaches upon relatively undisturbed native vegetation	Protection of vegetation and habitats beyond the disturbance footprint	Prior to and during construction	Thredbo
Hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas	Medium	Low	Any machinery or vehicles involved with the proposed works that are not owned by Thredbo will be washed down to remove all soil and vegetative matter before entering the site to limit spread of weeds and disease such as *Phytophthora cinnamomi*	Risk of weed or pathogen spread substantially reduced	Prior to and during construction	Thredbo
Staff training and site briefing to communicate environmental features to be protected and measures to be implemented	Medium	Low	Brief all workers as to limit of disturbance footprint and other environmental safeguards	Risk of disturbance beyond proposed disturbance corridor is reduced	Prior to and during construction as necessary	Thredbo
Making provision for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on or adjacent to the development footprint	Medium	Low	Post construction rehabilitation consistent with standard Thredbo rehabilitation strategies	Post construction vegetation within the development footprint with high medium-term recovery potential	Immediately post construction	Thredbo
Monitoring	Low	Low	None proposed	NA	NA	NA

7. Impact summary

Following implementation of the BAM and the BAMC, the following impacts have been determined.

7.1. Serious and Irreversible Impacts (SAII)

The development does not have any Serious and Irreversible Impacts (SAII).

7.2. Impacts requiring offsets

The impacts of the development requiring offset for native vegetation are outlined in **Table 24** and shown on **Figure 8**. The impacts of the development requiring offset for species credit species and their habitats are outlined in **Table 25** and on **Figure 8**.

Table 24: Impacts to native vegetation that require offsets

Vegetation Zone	PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
1	645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Subalpine Woodlands	Grassy Woodlands	0.06
2	645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Subalpine Woodlands	Grassy Woodlands	0.04
3	645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Subalpine Woodlands	Grassy Woodlands	0.1

Table 25: Impacts on threatened species and threatened species habitat that require offsets

Species	Common Name	Direct impact number of individuals / habitat (ha)	BC Act listing status	EPBC Act Listing status
Mastacomys fuscus	Broad-toothed Rat	0.1	Vulnerable	Vulnerable

7.3. Impacts not requiring offsets

All the impacts of the development on native vegetation and on the Broad-toothed Rat require offsets. The impacts of the proposed development on non-native vegetation do not require offsets. Those impacts that do not require offsets area shown in Figure 9.

7.4. Areas not requiring assessment

No parts of the proposed development do not require assessment.

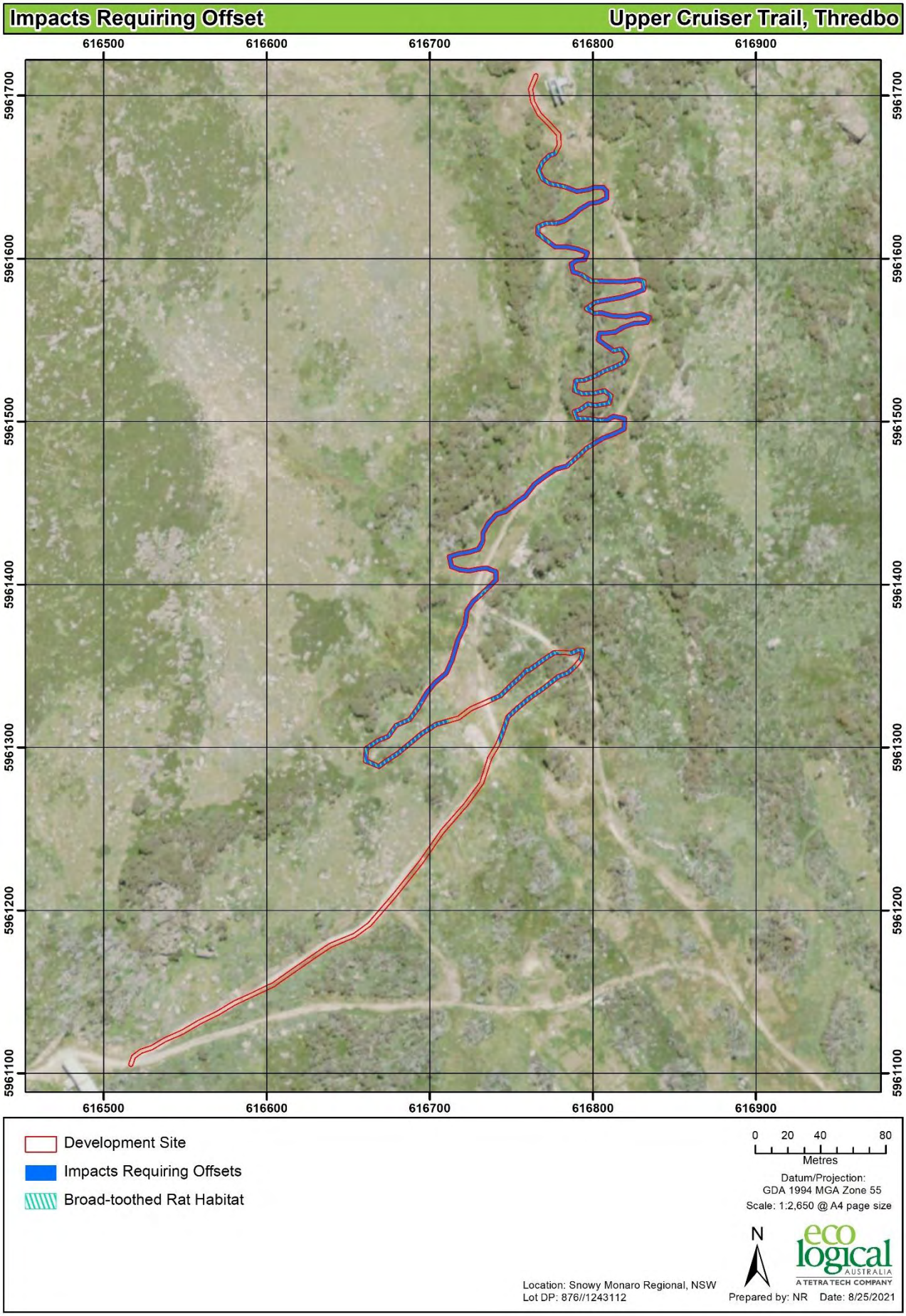


Figure 8: Impacts requiring offset

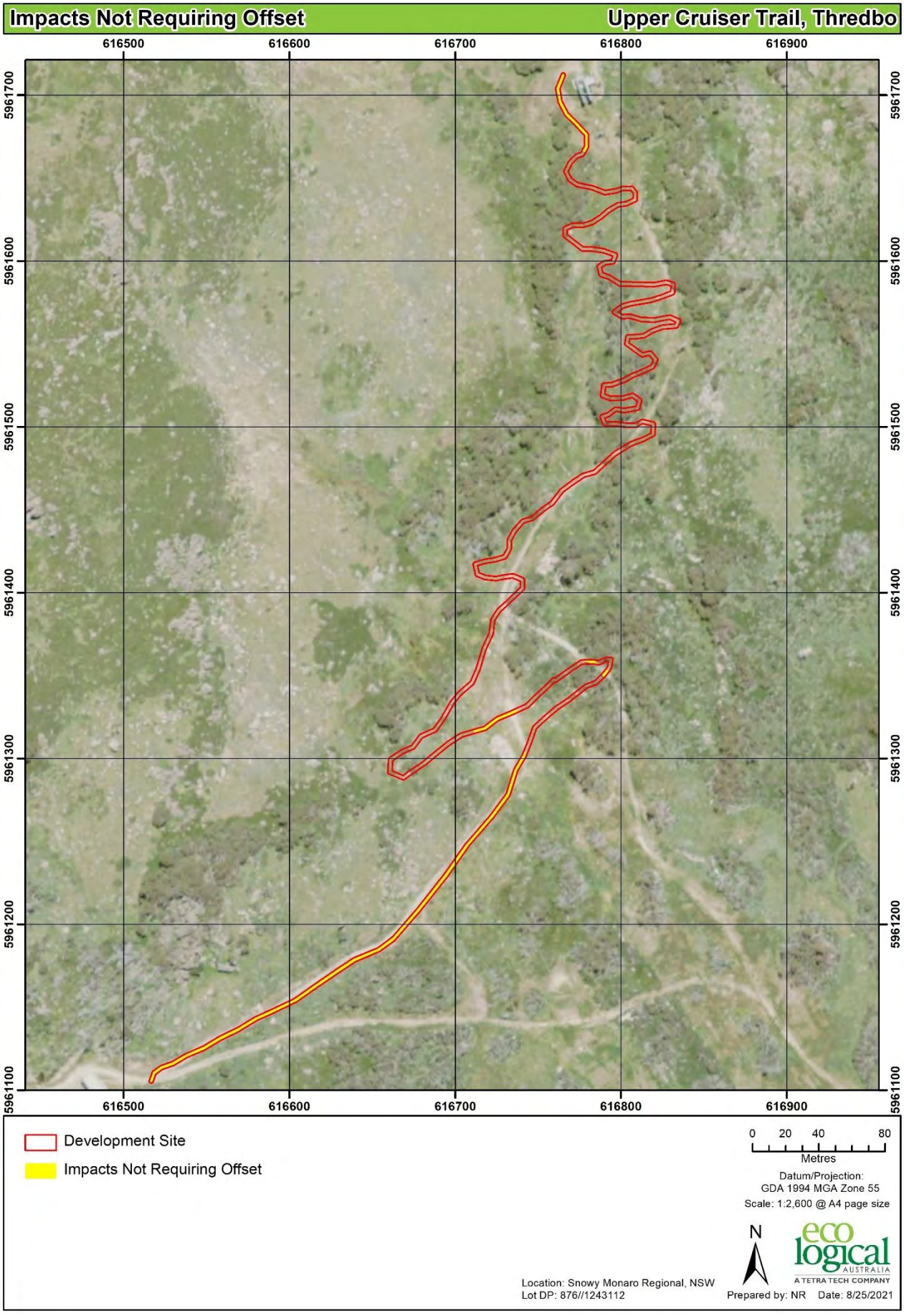


Figure 9: Impacts not requiring offset

7.5. Credit summary

The number of ecosystem credits required for the development are outlined in **Table 26**. The number of species credits required for the development are outlined in **Table 27**. A biodiversity credit report is included in **Appendix F**.

Table 26: Ecosystem credits required

Vegetation Zone	PCT ID	PCT Name	Condition	Credit Class	Direct impact (ha)	Credits required
1	645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Good	Grassy Woodlands	0.06	1
2	645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Moderate	Grassy Woodlands	0.04	1
3	645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Poor	Grassy Woodlands	0.1	2

Table 27: Species credit summary

Species	Common Name	Direct impact number of individuals / habitat (ha)	Credits required
Mastacomys fuscus	Broad-toothed Rat	0.1	3

8. Consistency with legislation and policy

8.1. Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

An impact assessment under the EPBC Act was undertaken on MNES known to occur within the development footprint or immediate surrounds or with potential to occur there. These MNES were:

- Alpine She-oak Skink
- Broad-toothed Rat.

The outcome of this assessment was that it is highly unlikely that the development would significantly impact on those MNES assessed (**Appendix D**).

A referral to the Commonwealth under the EPBC Act is not recommended.

9. Recommendations

To further ameliorate the potential impacts of the proposed development and to improve environmental outcomes, the following recommendations for impact mitigation and amelioration are suggested as modifications to the proposal and/or as conditions of consent.

- The mitigation measures identified in **Table 23** should be incorporated into the proposal.

10. Conclusion

Eco Logical Australia Pty Ltd was engaged by Kosciuszko Thredbo Pty Ltd to prepare a BDAR for the proposed construction of a new mountain bike trail and associated works in the Cruiser area of Thredbo Alpine Resort.

This report has been prepared to meet the requirements of the BAM 2020 established under Section 6.7 of the BC Act.

This BDAR outlines the measures taken to avoid, minimise and mitigate impacts to the vegetation and habitats present within the development footprint during the design, construction and operation of the development. The residual unavoidable impacts of the proposed development were calculated in accordance with the BAM by utilising the BAMC. The BAMC calculated that a total of four ecosystem credits and three species credits are required to offset the unavoidable impacts to the vegetation and fauna habitats present within the development footprint.

SAII values have been considered as part of this assessment. The proposal will not result in any SAII.

Following consideration of the administrative guidelines for determining significance under the EPBC Act, it is concluded that the proposal is unlikely to have a significant impact on MNES or Commonwealth land, and a referral to the Commonwealth Environment Minister is therefore not recommended.

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Appendix A - Definitions

The following terminology has been used throughout this report for the purposes of describing the impacts of the proposal in the context of a biodiversity assessment in accordance with the NSW Biodiversity Assessment Method 2020. This terminology may or may not align with other technical documents associated with the proposed development.

Terminology	Definition
Biodiversity credit report	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site.
BioNet Atlas	The BioNet Atlas (formerly known as the NSW Wildlife Atlas) is the OEH database of flora and fauna records. The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails) and some fish.
Broad condition state	Areas of the same PCT that are in relatively homogenous condition. Broad condition is used for stratifying areas of the same PCT into a vegetation zone for the purpose of determining the vegetation integrity score.
Connectivity	The measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.
Credit Calculator	The computer program that provides decision support to assessors and proponents by applying the BAM, and which calculates the number and class of biodiversity credits required to offset the impacts of a development or created at a biodiversity stewardship site.
Development	Has the same meaning as development at section 4 of the EP&A Act, or an activity in Part 5 of the EP&A Act. It also includes development as defined in section 115T of the EP&A Act.
Development footprint	The area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials.
Development site	An area of land that is subject to a proposed development that is under the EP&A Act.
Ecosystem credits	A measurement of the value of EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur with a PCT. Ecosystem credits measure the loss in biodiversity values at a development site and the gain in biodiversity values at a biodiversity stewardship site.
Extent of occurrence (EOO)	Measures the spatial spread of a taxon to determine the degree to which risks from threatening factors could impact an entire population, and is not intended to be an estimate of the amount of occupied or potential habitat.
High threat exotic plant cover	Plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species.
Hollow bearing tree	A living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the minimum entrance width is at least 5 cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1 m above the ground. Trees must be examined from all angles.
Important wetland	A wetland that is listed in the Directory of Important Wetlands of Australia (DIWA) and SEPP 14 Coastal Wetlands.
Linear shaped development	Development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length.
Local population	The population that occurs in the study area. In cases where multiple populations occur in the study area or a population occupies part of the study area, impacts on each subpopulation must be assessed separately.
Local wetland	Any wetland that is not identified as an important wetland (refer to definition of Important wetland).

Terminology	Definition
NSW (Mitchell) landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.
Multiple fragmentation impact development	Developments such as wind farms and coal seam gas extraction that require multiple extraction points (wells) or turbines and a network of associated development including roads, tracks, gathering systems/flow lines, transmission lines.
Operational Manual	The Operational Manual published from time to time by DPIE, which is a guide to assist assessors when using the BAM.
Patch size	An area of intact native vegetation that: a) occurs on the development site or biodiversity stewardship site, and b) includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems). Patch size may extend onto adjoining land that is not part of the development site or stewardship site.
Proponent	A person who intends to apply for consent to carry out development or for approval for an activity.
Reference sites	The relatively unmodified sites that are assessed to obtain local benchmark information when benchmarks in the Vegetation Benchmarks Database are too broad or otherwise incorrect for the PCT and/or local situation. Benchmarks can also be obtained from published sources.
Regeneration	The proportion of over-storey species characteristic of the PCT that are naturally regenerating and have a diameter at breast height <5 cm within a vegetation zone.
Residual impact	An impact on biodiversity values after all reasonable measures have been taken to avoid, minimise or mitigate the impacts of development. Under the BAM, an offset requirement is determined for the remaining impacts on biodiversity values.
Retirement of credits	The purchase and retirement of biodiversity credits from an already-established biobank site or a biodiversity stewardship site secured by a biodiversity stewardship agreement.
Riparian buffer	Riparian buffers applied to water bodies in accordance with the BAM.
Sensitive biodiversity values land map	Development within an area identified on the map requires assessment using the BAM.
Site attributes	The matters assessed to determine vegetation integrity. They include: native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.
Site-based development	A development other than a linear shaped development, or a multiple fragmentation impact development
Species credits	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
Subject land	Is land to which the BAM is applied in Stage 1 to assess the biodiversity values of the land. It includes land that may be a development site, clearing site, proposed for biodiversity certification or land that is proposed for a biodiversity stewardship agreement.
Threatened Biodiversity Data Collection	Part of the BioNet database, published by DPIE and accessible from the BioNet website.
Threatened species	Critically Endangered, Endangered or Vulnerable threatened species as defined by Schedule 1 of the BC Act, or any additional threatened species listed under Part 13 of the EPBC Act as Critically Endangered, Endangered or Vulnerable.

Terminology	Definition
Vegetation Benchmarks Database	A database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by OEH and is part of the BioNet Vegetation Classification.
Vegetation zone	A relatively homogenous area of native vegetation on a development site, land to be biodiversity certified or a biodiversity stewardship site that is the same PCT and broad condition state.
Wetland	An area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle. Wetlands may exhibit wet and dry phases and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water.
Woody native vegetation	Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs.

Appendix B - Vegetation Floristic Plot Data

Table 28: Species recorded in the plots and incidentally elsewhere within the development site or immediate surrounds.

Family	Species	Common Name	Listing Status	Exotic	High Threat Weed	Growth Form Group	Plot 1			Plot 2			Plot 3		
							Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance
Rosaceae	*Acaena* sp.	Sheep's Burr	-			Forb (FG)	g	0.1	5	g	1	50	g	2	50
Polygonaceae	*Acetosella vulgaris*	Sheep Sorrel	-	Yes	Yes	-	g	0.1	20	g	0.5	500	g	0.1	100
Apiaceae	*Aciphylla glacialis*	Mountain Celery	-			Forb (FG)	g	0.2	10	0	0	0	0	0	0
Apiaceae	*Aciphylla simplicifolia*	Mountain Aciphyll	-			Forb (FG)	0	0	0	0	0	0	g	0.1	2
Poaceae	*Agrostis capillaris*	Browntop Bent	-	Yes	Yes	-	0	0	0	g	1	500	g	0.1	20
Rubiaceae	*Asperula gunnii*	Mountain Woodruff	-			Forb (FG)	g	0.1	50	g	0.4	500	g	0.1	20
Myrtaceae	*Baeckea gunniana*	Alpine Baeckea	-			Shrub (SG)	0	0	0	0	0	0	m	1	5
Cyperaceae	*Carex breviculmis*		-			Grass & grasslike (GG)	0	0	0	g	0.2	100	g	0.1	50
Cyperaceae	*Carex inversa*	Knob Sedge	-			Grass & grasslike (GG)	0	0	0	0	0	0	g	0.1	20
Asteraceae	*Celmisia pugioniformis*		-			Forb (FG)	g	0.1	5	g	2	500	g	1	100
Poaceae	*Chionochloa frigida*	Robust Wallaby Grass	-			Grass & grasslike (GG)	0	0	0	0	0	0	g	6	50
Asteraceae	*Coronidium scorpioides*	Button Everlasting	-			Forb (FG)	0	0	0	g	1	100	g	3	500
Asteraceae	*Craspedia aurantia*		-			Forb (FG)	0	0	0	g	0.1	20	g	0.1	20
Poaceae	*Deyeuxia crassiuscula*		-			Grass & grasslike (GG)	g	0.1	20	g	0.1	100	g	0.1	20
Restionaceae	*Empodisma minus*		-			Grass & grasslike (GG)	g	0.5	50	0	0	0	g	2	100
Ericaceae	*Epacris paludosa*	Swamp Heath	-			Shrub (SG)	0	0	0	0	0	0	m	1	5
Myrtaceae	*Eucalyptus niphophila*		-			Tree (TG)	u	45	20	m	0.5	3	m	3	20

Family	Species	Common Name	Listing Status	Exotic	High Threat Weed	Growth Form Group	Plot 1			Plot 2			Plot 3		
							Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance
Poaceae	*Festuca rubra* subsp. *rubra*	Red Fescue	-	Yes		-	0	0	0	g	10	1000	0	0	0
Proteaceae	*Grevillea australis*	Alpine Grevillea	-			Shrub (SG)	0	0	0	g	1	10	m	6	50
Fabaceae (Faboideae)	*Hovea montana*		-			Shrub (SG)	0	0	0	g	2	50	0	0	0
Asteraceae	*Hypochaeris radicata*	Catsear	-	Yes		-	0	0	0	g	0.1	20	g	0.1	10
Ericaceae	*Leucopogon montanus.*	A Beard-heath	-			Shrub (SG)	g	0.1	5	0	0	0	0	0	0
Juncaceae	*Luzula novae-cambriae*		-			Grass & grasslike (GG)	0	0	0	0	0	0	g	0.1	10
Lycopodiaceae	*Lycopodium fastigiatum*	Mountain Clubmoss	-			Fern (EG)	g	0.1	10	0	0	0	g	0.1	20
Asteraceae	*Microseris lanceolata*	Yam Daisy	-			Forb (FG)	0	0	0	g	2	500	g	2	500
Rutaceae	*Nematolepis ovatifolia*		-			Shrub (SG)	m	10	20	0	0	0	0	0	0
Asteraceae	*Olearia phlogopappa*		-			Shrub (SG)	g	0.1	10	g	3	50	g	3	100
Apiaceae	*Oreomyrrhis eriopoda*	Australian Carraway	-			Forb (FG)	g	0.1	20	g	2	1000	g	0.1	20
Fabaceae (Faboideae)	*Oxylobium ellipticum*	Common Shaggy Pea	-			Shrub (SG)	g	35	100	g	30	100	g	8	100
Asteraceae	*Ozothamnus cupressoides*		-			Shrub (SG)	m	3	10	m	2	10	m	4	20
Asteraceae	*Ozothamnus secundiflorus*	Cascade Everlasting	-			Shrub (SG)	0	0	0	0	0	0	m	15	10
Thymelaeaceae	*Pimelea alpina*		-			Shrub (SG)	g	0.3	50	0	0	0	g	0.1	20
Poaceae	*Poa fawcettiae*	Smooth Blue Snowgrass	-			Grass & grasslike (GG)	g	35	1000	g	45	2000	g	20	1000

Family	Species	Common Name	Listing Status	Exotic	High Threat Weed	Growth Form Group	Plot 1			Plot 2			Plot 3		
							Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance
Podocarpaceae	*Podocarpus lawrencei*	Mountain Plum Pine	-			Shrub (SG)	m	0.1	2	0	0	0	0	0	0
Dryopteridaceae	*Polystichum proliferum*	Mother Shield Fern	-			Fern (EG)	0	0	0	0	0	0	g	0.2	20
Phyllanthaceae	*Poranthera microphylla*	Small Poranthera	-			Forb (FG)	0	0	0	0	0	0	g	0.1	10
Ranunculaceae	*Ranunculus graniticola*	Granite Buttercup	-			Forb (FG)	0	0	0	g	0.3	50	0	0	0
Ericaceae	*Richea continentis*	Candle Heath	-			Shrub (SG)	m	1	10	0	0	0	m	1	20
Poaceae	*Rytidosperma* sp.		-			Grass & grasslike (GG)	0	0	0	0	0	0	0	0	0
Asteraceae	*Senecio gunnii*		-			Forb (FG)	0	0	0	g	0.1	1	g	0.1	5
Asteraceae	*Senecio pinnatifolius* var. *alpinus*		-			Forb (FG)	0	0	0	g	0.1	1	g	0.1	2
Winteraceae	*Tasmannia xerophila* subsp. *xerophila*	Alpine Pepperbush	-			Shrub (SG)	m	0.2	10	0	0	0	g	0.1	1
Poaceae	*Trisetum spicatum*	Bristle Grass	-			Grass & grasslike (GG)	0	0	0	g	0.1	20	g	0.1	20
Violaceae	*Viola betonicifolia*	Native Violet	-			Forb (FG)	0	0	0	g	0.1	20	g	0.1	20

Appendix C - Vegetation Integrity Plot Data

Table 29: Plot location data

Plot no.	PCT	Condition	Easting	Northing	Bearing
1	645	**Good**	616773	5961654	180
2	645	Moderate	616699	5961339	210
3	645	Poor	616811	5961599	150

Table 30: Vegetation integrity data (composition)

Composition (number of species)						
Plot	Tree	Shrub	Grass	Forb	Fern	Other
1	1	9	3	5	1	0
2	1	10	8	12	2	0
3	1	5	4	11	0	0

Table 31: Vegetation integrity data (Structure)

Structure (Total cover)						
Plot	Tree	Shrub	Grass	Forb	Fern	Other
1	45	49.8	35.6	0.6	0.1	0
2	3	39.2	28.5	8.8	0.3	0
3	0.5	38	45.4	9.1	0	0

Table 32: Vegetation integrity data (Function)

Function											
Plot	Large Trees	Hollow trees	Litter Cover	Length Fallen Logs	Tree Stem 5-9	Tree Stem 10-1 9	Tree Stem 20-29	Tree Stem 30-49	Tree Stem 50-79	Tree Regen	High Threat Weed Cover
1	4	2	30	63	1	1	1	1	1	1	0.1
2	0	0	43	3	1	0	0	0	0	1	0.2
3	0	0	7	0	0	0	0	0	0	1	1.5

Appendix D - EPBC Act Significant Impact Criteria

The EPBC Act Administrative Guidelines on Significance (DoE 2013) 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
- 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.

The Commonwealth listed species which are known or considered to have the potential to occur within the study area are the:

- Alpine She-oak Skink
- Broad-toothed Rat

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

Matters to be considered	Impact
Any environmental impact on a World Heritage Property or National Heritage Places	No. The proposed action does not impact on a World Heritage Property or a National Heritage Place - (listed natural: Australian Alpine National Parks and Reserves; nominated historic: Snowy Mountains Scheme NSW).
Any environmental impact on Wetlands of International Importance	No. The proposal will not affect any part of a wetland of international importance.
Any impact on Commonwealth Listed Critically Endangered or Endangered Species;	Yes. The study area does provide potential habitat for the following Commonwealth listed endangered species: Alpine She-oak Skink The significant impact criteria for endangered species are discussed below: a. lead to a long-term decrease in the size a population of a species. The impacts associated with the proposed action will result in the removal of only a very small area of marginal potential habitat for the Alpine She-oak Skink. It is considered highly unlikely that the proposed works would result in injury or death of any Alpine She-oak Skink individuals as the disturbances associated with the proposed works are likely to temporarily deter any individuals from using the locations where works are being undertaken, and there is adequate alternative habitat available for individuals to use. Under these circumstances, it is considered highly unlikely that the proposed action 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 removal of a relatively small amount of vegetation in the context of the extent of this resource in the locality and is highly unlikely to affect any key

Matters to be considered	Impact
	habitat resources for the Alpine She-oak Skink; nor affect its ability to access habitats within or beyond the development site. Under these circumstances, the proposed action is highly unlikely to reduce the area of occupancy of the local population of the Alpine She-oak Skink. c. fragment an existing population into two or more populations The proposed action will be limited to the removal of a relatively small amount of vegetation and rocks in the context of the extent of these resources in the locality and is highly unlikely to affect any key habitat resources for the Alpine She-oak Skink; nor affect its ability to access habitats within or beyond the development site. Under these circumstances, the proposed action will not fragment an existing population of the Alpine She-oak Skink into two or more populations. d. adversely affect habitat critical to the survival of a species No habitat within the development site is considered likely to be critical to the survival of the Alpine She-oak Skink. 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. There is sufficient retained habitat such that individuals can continue to survive. e. disrupt the breeding cycle of a population It is possible although unlikely that the Alpine She-oak Skink may breed within the development site. However, any local population of these species is highly unlikely to be limited to the development site, which represents only a very small proportion of the potential habitat available to the species in the locality and so breeding can proceed as normal in the other available areas. Under these circumstances, it is highly unlikely that the proposed action 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 potential habitat for the Alpine She-oak Skink, but this area is unlikely to be important to these species in the context of the extent of potential habitat in the locality. Under these circumstances it is highly unlikely that the proposed action would modify- destroy- remove or isolate or decrease the availability or quality of habitat to the extent that the 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 Alpine She-oak Skink. Species such as cats or foxes are already present in the landscape and are subject to control programs within the resort. h. introduce disease that may cause the species to decline The proposed action is unlikely to introduce disease that may cause the 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 Alpine She-oak Skink is unlikely to be adversely impacted.
Any impact on Commonwealth Listed Vulnerable Species;	Yes. The study area provides known habitat for one Commonwealth listed vulnerable species: the Broad-toothed Rat. The significant impact criteria in terms of the vulnerable species are discussed below: a. lead to a long-term decrease in the size of an important population of a species. Whilst the proposed action will affect some known Broad-toothed Rat habitat, it will affect only a very small amount of the potential habitat for the species in the immediate area. As such, the proposed works are unlikely to adversely affect a significant proportion of the home range of one or more Broad-toothed Rat individuals and will not result in habitat fragmentation which could isolate individuals or a population of the Broad-toothed Rat. The noise and vibration

Matters to be considered	Impact
	associated with the proposed works 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 killed during the implementation of the proposed action. Under these circumstances the proposed action will not lead to a long-term decrease in the size of an important population of the Broad-toothed Rat. b. reduce the area of occupancy of an important population It is highly likely that the Broad-toothed Rat will continue to occur within the development site after the implementation of the proposed action. The species continues to be locally common in the Thredbo Resort Area where there have been many similar and larger developments over many decades. As such, the proposed action is highly unlikely to reduce the area of occupancy of the Broad-toothed Rat. c. fragment an existing important population into two or more populations The proposed action will not fragment an existing important population of the Broad-toothed Rat into two or more populations. The species population extends beyond the development site and the Thredbo Resort Area. d. adversely affect habitat critical to the survival of a species No habitat within the development site is considered to be critical to the survival of the Broad-toothed Rat. e. disrupt the breeding cycle of an important population The proposed action and affected area is too small to disrupt the breeding cycle of a population of the Broad-toothed Rat. f. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline The proposed action will not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the Broad-toothed Rat is likely to decline as the habitat to be affected is very small in the context of the available habitat within the Thredbo Resort Area and the proposal will not cause any additional fragmentation of habitat or barriers to movement. g. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat The proposed action will not result in invasive species that are harmful becoming established in habitat for the Broad-toothed Rat. And such species, including foxes and cats, are already present. h. introduce disease that may cause the species to decline The proposed action is unlikely to introduce disease that may cause the Broad-toothed Rat to decline. i. interferes substantially with the recovery of the species. Whilst there have been documented declines in some Broad-toothed Rat populations within the Snowy Mountains, these declines have been attributed to factors such as major bushfire events and early snow thaws- and not impacts of the nature of those proposed. 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- including within the village, and in areas that have been subject to the sorts of activities proposed. As such, it is considered highly unlikely that proposed action will substantially interfere with the recovery of the Broad-toothed Rat.
Any impact on a Commonwealth Endangered Ecological Community	No endangered ecological communities occur within the development site.
Any environmental impact on Commonwealth Listed Migratory Species;	No. The proposed action will not have any adverse impacts on any listed migratory species.
Does any part of the Proposal involve a Nuclear Action;	No. The project does not include a Nuclear Action.

Matters to be considered	Impact
Any environmental impact on a Commonwealth Marine Area;	No. There are no Commonwealth Marine Areas within the study area.
In addition- any direct or indirect impact on Commonwealth lands	No. The project does not directly or indirectly affect Commonwealth land.

Appendix E - Staff CVs

CURRICULUM VITAE

Ryan Smithers

SENIOR ECOLOGIST

QUALIFICATIONS

BEnvSc (Land Resources Management)- University of Wollongong with 1st Class Honours 1995.
Accredited BBAM- FBA- and BAM Assessor
Alpine Ecology Course Australian Alpine Institute and La Trobe University
Senior First Aid- St. Johns Ambulance.

Ryan brings to ELA more than 20 years' experience in natural resource management (21 years as a consultant- and 3 years with Sydney Catchment Authority as a Catchment Protection Officer). He has extensive practical experience in flora and fauna surveying- fire-fighting- planning and land management throughout southern NSW and has undertaken numerous flora and fauna surveys- biodiversity plans- environmental impact assessments- vegetation management plans- fire management plans and weed management plans.

Ryan has extensive experience in general and targeted fauna surveys using a diverse range of survey techniques. Ryan has undertaken many flora and fauna surveys on the NSW south coast- southern tablelands and in the Australian Alps- and in other parts of Australia including in the Northern Territory.

Ryan is an accredited Biobanking (BBAM)- Framework for Biodiversity Assessment (FBA) and Biodiversity Assessment Method (BAM) assessor and has undertaken may surveys using BBAM-BAM and DPIE Vegetation Survey Standard or very similar methodologies. Ryan project managed ELAs contributions to the Full-floristic Vegetation Survey and Condition Assessment for the South-east Highlands and Australian Alps of the Upper Murrumbidgee Catchment and South-east Corner Biometric Benchmark projects which involved the collection of more than 250 plots.

Ryan has particular ecological expertise in the NSW southern tablelands and Alps- gained from 15 years of survey and assessment across the Alps- including many assessments within the Charlotte Pass- Thredbo and Perisher Ski Resorts- and assessments on the Monaro including around Jindabyne.

Ryan has undertaken assessments in the region for a broad range of clients including NSW NPWS, Local Land Services, Biodiversity Conservation Trust, Kosciuszko Thredbo, Vail Resorts and Charlotte Pass Ski Resort.

RELEVANT PROJECT EXPERIENCE

Monaro and Werriwa Snow Gum Woodland and Grasslands Conservation Tender
Monaro Grasslands Conservation Tender
Kosi Walk Realignment Review of Environmental Factors
Diggings Campground Upgrade Review of Environmental Factors
Mount Perisher Chairlift Biodiversity Development Assessment Report
Merritts Gondola Biodiversity Development Assessment Report
Corin Forest Ski Slope Assessment
Montane Peatlands Strategic Action Plan
Perisher Guthega Skink Targeted Surveys
Numerous Mountain Bike Ecological Assessments at Thredbo
Leichardt Chairlift Ecological Assessment
Thredbo Masterplan Ecological Assessment
Guthega Quad Chair Flora and Fauna Assessment
Thredbo Chairlift Constraints Analysis
Friday Flat Ecological Assessment
Sponars Traverse Flora and Fauna Assessment
Lobs Hole Review of Environmental Factors
Lake Wallace Flora and Fauna Assessment for Cooma Monaro Shire at Nimmitabel
Numerous Impact Assessments in alpine and sub-alpine environments for OEH- Vail- Kosciuszko- Thredbo and Charlotte Pass Ski Resorts
Boco Rock Wind Farm Ecological Assessment and Offsets Analysis
South-east Highlands and Australian Alps of the Upper Murrumbidgee Catchment Full Floristic Survey and Condition Assessment
South-east Corner Biometric Benchmark Project
Queanbeyan Biodiversity Study
Mount Jerrabomberra Ecological Assessment
Eurobodalla Bio-certification Project
Jervis Bay Biodiversity Assessment
Broulee and South Moruya Biocertification Project
North Moruya Biodiversity Study
Eurobodalla Vegetation Mapping Validation
Eurobodalla Biodiversity Study for future Urban Expansion Lands
Merimbula STP Upgrade Terrestrial Ecological Assessment
Cobowra LALC Lands Biobanking Assessment
Upper Lachlan Shire Biodiversity Planning Framework
Parkes- Cabonne- Bland- Upper Lachlan and Temora Shires Biodiversity Assessment and NRM Projects
Old Comma Road deviation Species Impact Statement
Flora and Fauna Assessment Edwin Lane Parkway Extension
Ecological Studies – Proposed Googong township
Tarrawonga Biobanking Assessment – Boggabri
Katherine to Gove Pipeline – Mitchell Ranges fauna surveys
Darwin regional flora and fauna survey RAAF Darwin- defence establishment Berrimah and Shoal Bay receiving station.

Appendix F - Biodiversity credit report

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APPENDIX C

AHIMS SEARCH RESULTS

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 21-20

Client Service ID : 619647

dabyne planning

Date: 03 September 2021

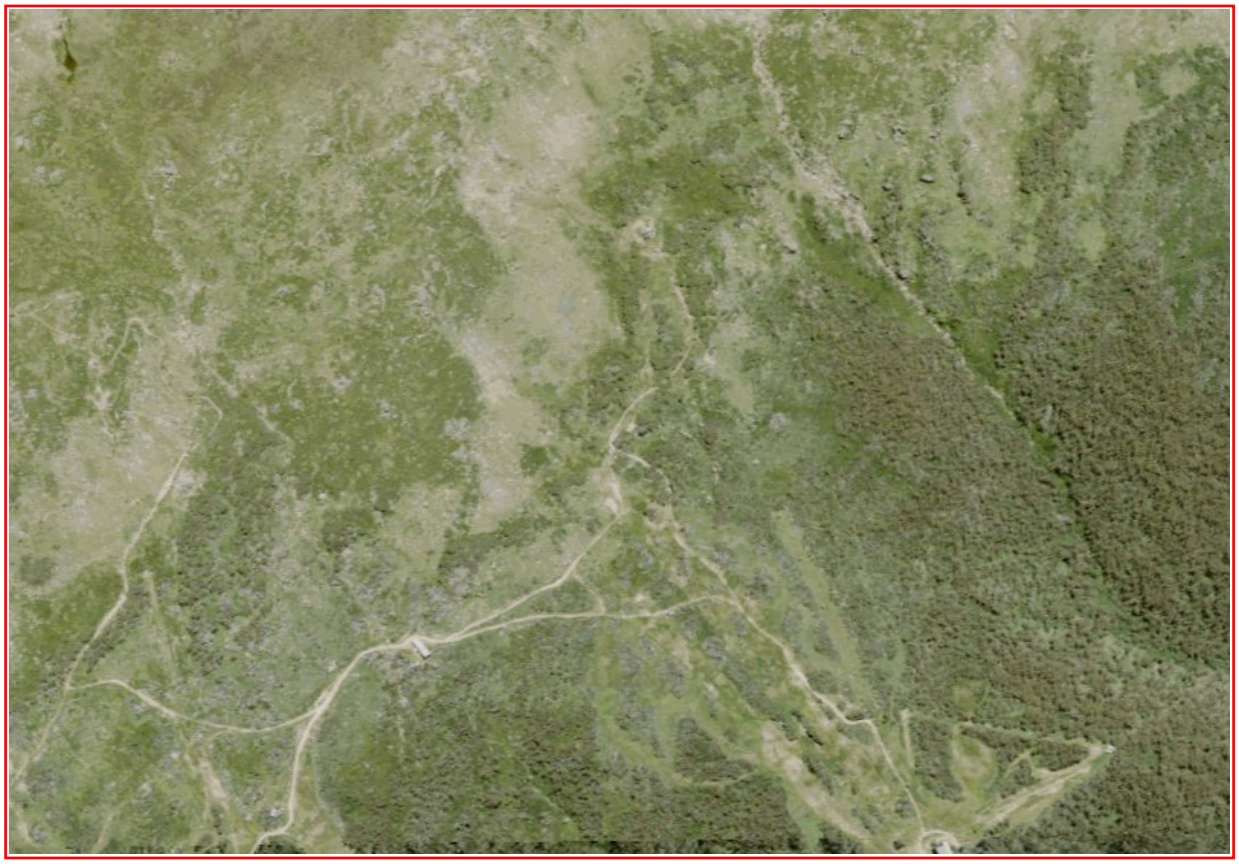
Attention: Ivan Pasalich

Email: ivan@dabyneplanning.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -36.49, 148.3 - Lat, Long To : -36.48, 148.31, conducted by Ivan Pasalich on 03 September 2021.

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.

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Tel: (02) 9585 6345

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