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and Environment

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Signed Z Derbyshire

Sheet No 1 of 4

STATEMENT OF ENVIRONMENTAL EFFECTS

KOSCIUSZKO FLOW TRAIL DIVERSION
SNOWGUMS TOP STATION
THREDBO ALPINE RESORT
KOSCIUSZKO NATIONAL PARK

Prepared for:
Kosciuszko Thredbo Pty Ltd

AUGUST 2023
Project: 08-23

STATEMENT OF ENVIRONMENTAL EFFECTS

KOSCIUSZKO FLOW TRAIL DIVERSION
SNOWGUMS TOP STATION
THREDBO ALPINE RESORT
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This report has been prepared by:

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Principal
Dabyne Planning Pty Ltd

AUGUST 2023

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CONTENTS

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 and Environment (DPE).

The DA is for undertaking a trail diversion for the Kosciuszko Flow Trail, a mountain bike trail, in and around the Snowgums Chairlift top station in anticipation for the planned replacement and upgrade of the Snowgums Chairlift, Thredbo Alpine Resort.

The proposed diversion of the Kosciuszko Flow Trail will relocate the trail from the southern side Black Sallees restaurant to the northern side of the Black Sallees restaurant. The trail will connect back into the existing Kosciuszko Flow Trail below the Black Sallees restaurant. The new trail alignment is 200m in length.

The diversion of the Kosciuszko Flow Trail will allow for the planned replacement and upgrade of the Snowgums Chairlift and construction of the top station.

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

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

Following the preliminary analysis work, a 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.

The realigned trail will be located within mapped 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 one (1) ecosystem credit and one (1) species credit 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 Site Environmental Management Plan (SEMP).

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 the Environmental Planning and Assessment Regulations 2021.

2. THE LOCALITY AND SITE

2.1 The Locality

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

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

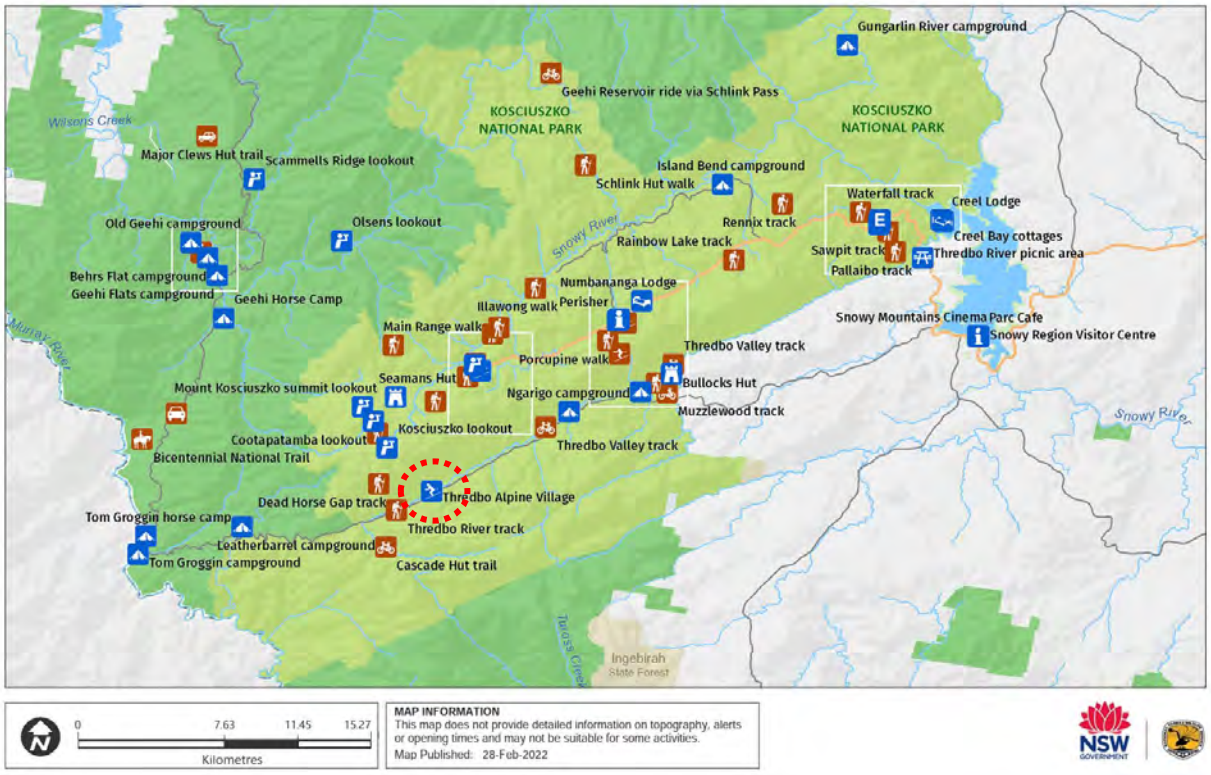


Figure 1: Context of the site within the region

2.2 The Site

The proposed realigned Kosciuszko Flow Trail is approximately 200m in length and will relocate the current trail from the southern side of the Black Sallees restaurant to the northern side.

The location of these works is illustrated in figure 2 below, with photos provided in Appendix A.

Figure 2: Location of the subject works

The current section of the Kosciuszko Flow Trail located on the southern side of the Black Sallees restaurant will be temporarily closed during construction of the planned Snowgums Chairlift.

The realigned trail has been designed to avoid watercourses. The proposed trail is located more than 40m from any defined watercourse as illustrated in figure 3.

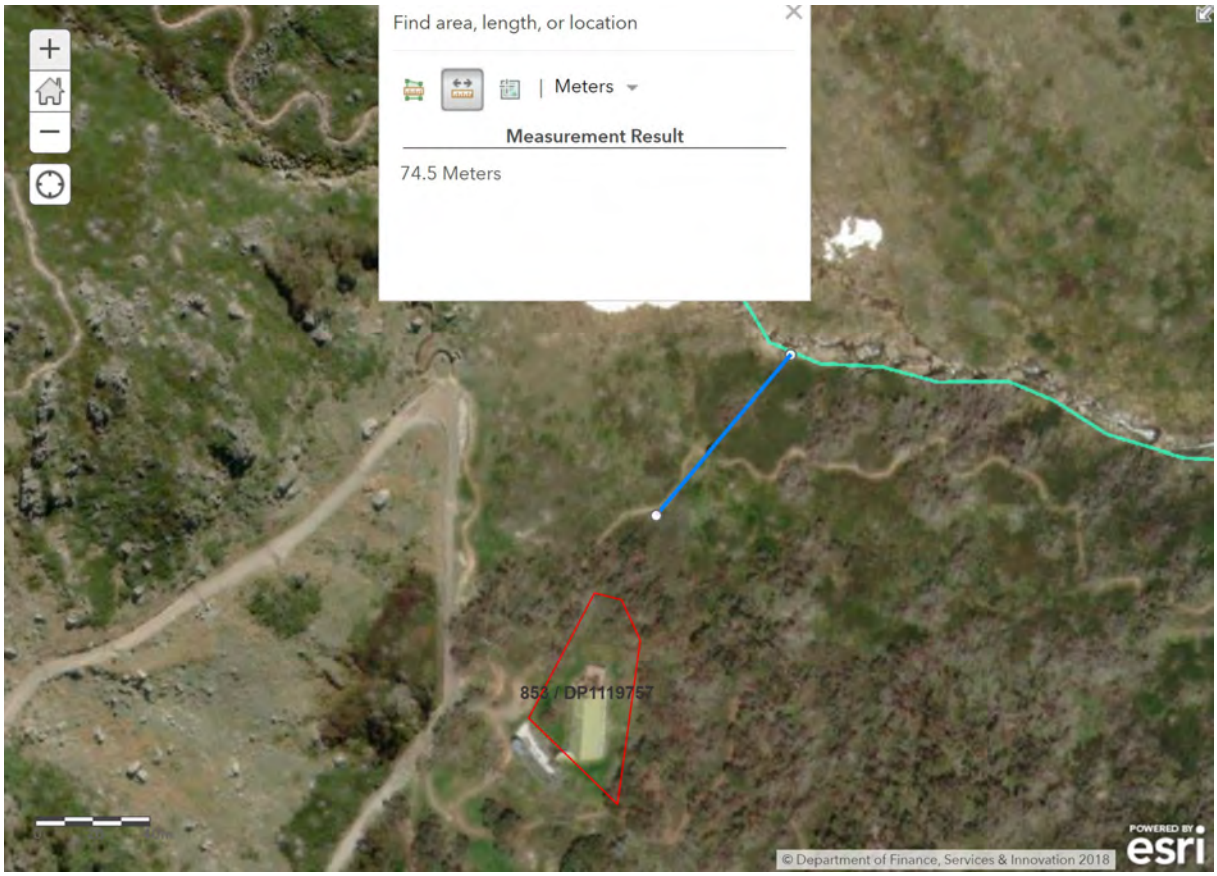


Figure 3: Location of the realigned trail in relation to the closest mapped watercourse

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

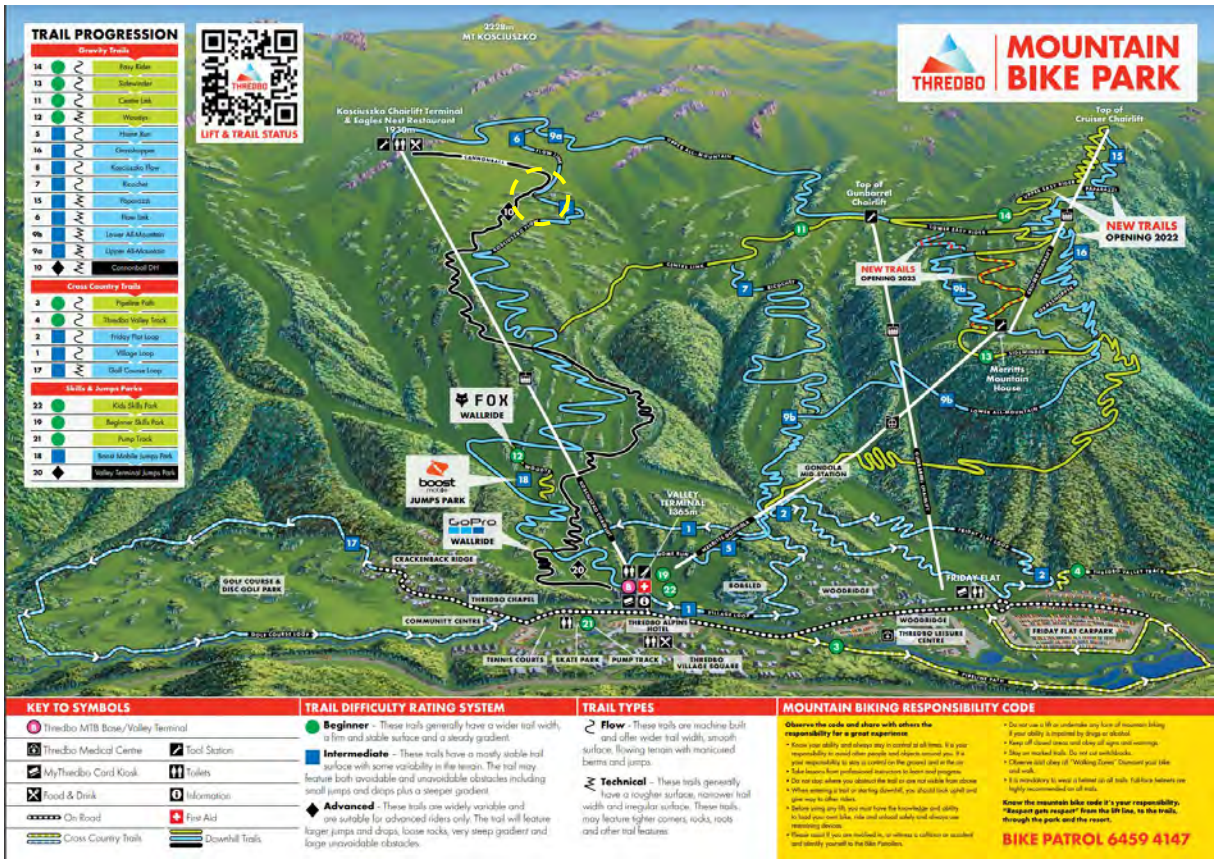


Figure 4: Location of the re-aligned Kosciuszko Flow Trail (yellow circle) in context with the Thredbo Mountain Bike Park Map (Source: Thredbo Alpine Resort)

3. SITE ANALYSIS PROCESS

3.1 Introduction

The final trail alignment of the realigned Kosciuszko Flow Trail has been subject to an operational, planning and environmental analysis.

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

3.2 Trail Design Principles

The original key design principles, developed for the recently constructed mountain bike trails have been further refined and applied to the design and siting of the realigned Kosciuszko Flow Trail, as summarised below.

Key Design Principles:

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

The Rolling Contours Concept:

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

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

Outslope:

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

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

The Half Rule:

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

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

The 10% Average Guideline:

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

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

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

Frequent Grade Reversals

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

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

3.3 Preliminary Site Assessment

The realignment of the Kosciuszko Flow Trail was subject to an extensive preliminary site analysis to determine the appropriate location for the realigned trail to accommodate the future planned redevelopment of the Snowgums Chairlift.

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

This included a 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

Realigned Kosciuszko Flow Trail (MTB) - Summary:

Trail Length:	200m
Type of Trail:	Flow
Proposed Difficulty Rating:	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	0.03ha (see BDAR)

Trail Description:

The re-aligned Kosciuszko Flow Trail is a single direction mountain bike trail that will be accessed from the summer access road and during construction of the Snowgums Chairlift, mountain bikers will be directed onto the existing Flow Trail link, below the road.

The new realigned trail will head north of the Black Sallees restaurant.

This will allow for the Kosciuszko Flow Trail to avoid the Snowgums Chairlift top station and its future planned construction for its replacement and upgrade.

Figure 10: Riders will use the Flow Link trail to access the realigned Flow Trail

The proposed trail will cross the current Merritts Nature Track (walking trail) and head in a northern direction, generally on contour (using the rolling contours concept) and a grade reversal before a right hand hair pin to direct the trail in a southern direction.

The trail will then follow the contour back to the existing Kosciuszko Flow Trail, below the Black Sallees restaurant.

Figure 11: Re-aligned Kosciuszko Flow Trail to head in southerly direction generally on contour towards the existing trail

The trail will join into the existing Kosciuszko Flow Trail and a hair pin corner, providing on contour alignment and connection.

Figure 12: Re-aligned Kosciuszko Flow Trail to link into the existing Kosciuszko Flow Trail

The existing section of the Kosciuszko Flow Trail located to the south of the Black Sallees restaurant, is proposed to be temporarily closed during construction of the Snowgums Chairlift.

Photo points along the proposed alignment are provided in Appendix A.

Trail Signage:

As part of the re-alignment of the Flow Trail, trail signage is also proposed in form of Waymarkers.

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

Waymarkers should be used:

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

On this basis, the realigned 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 13 below.

Figure 13: Example of a Waymarker at Thredbo

4.2 General Construction

4.2.1 MTB Trail Construction

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

As the proposed realigned Kosciuszko Flow Trail is proposed be an 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 14 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 14: 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 15 below.

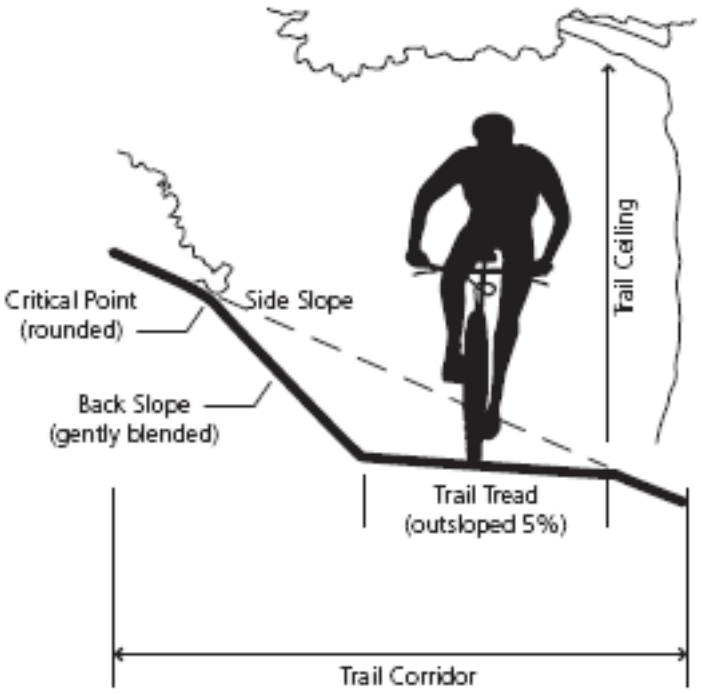


Figure 15: Trail corridor diagram (Source: IMBA)

For the purposes of determining the average trail corridor and therefore average extent of disturbance, the trail corridor has been designed to be 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 trail 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 realigned Kosciuszko Flow 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 16 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.

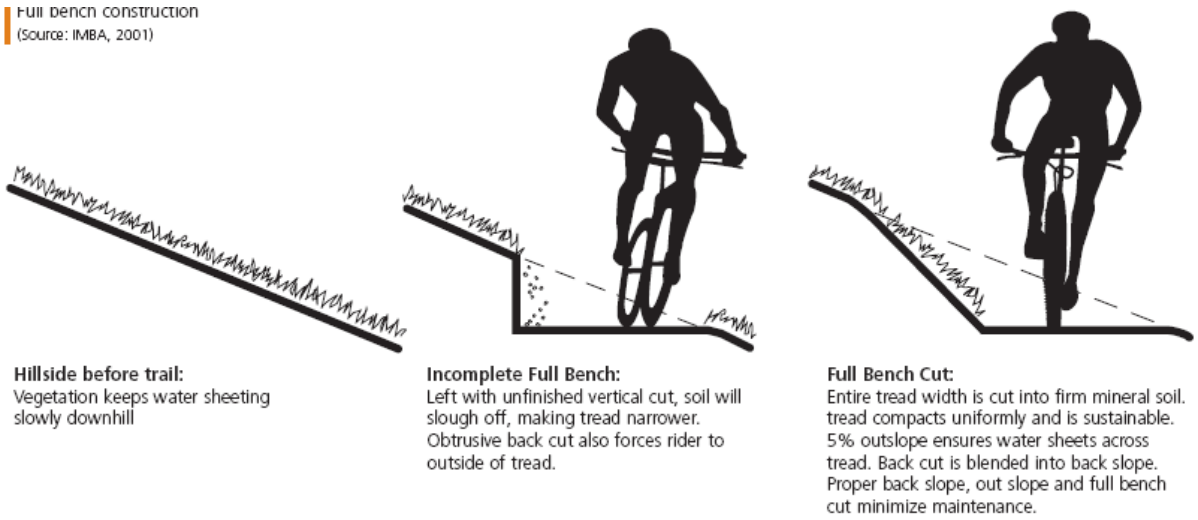


Figure 16: Full Bench Construction (Source: IMBA)

The trail surface

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

Surface water control

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

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

Figure 17: Example of a drain dip, rock hardened on the All-Mountain Trail

Rock Armouring

Rock armouring as shown in the example below in figure 18 is used to harden trails to create an elevated trail tread above wet or soft terrain and to harden the trail tread against user caused erosion.

Figure 18: Example of rock armouring on the Sidewinder Trail

4.2.2 Construction Sequence

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

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

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

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

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

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

4.2.3 Construction Timing, Site Compound and Stockpile Site

Construction for the proposed development is programmed to commence during the summer of 2023/24.

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

5. KEY MATTERS FOR CONSIDERATION

5.1 Biodiversity

In accordance with the Biodiversity Values Map under the BC Act, 2016, the subject site is predominantly 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 one (1) ecosystem credit and one (1) species credit 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 trail diversion 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:

Extensive archaeological studies for the ski slope area of Thredbo have been previously undertaken by Past Traces Heritage Consultants, Navin Officer Heritage Consultants, NSW Archaeology, Ironbark Heritage and NGH Environmental and these 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.

Given the extent of the previous disturbance, these developments would have removed the topsoils and disturbed soil profiles, thus removing potential for Aboriginal sites to remain within these locations.

Step 3. Can you avoid harm to the object or disturbance of the landscape feature?

The proposed works will be located within an area partly previous disturbed and an area associated with an include ski slope, covered in heath vegetation.

As a result, it is considered that the project has low potential to impact on unrecorded Aboriginal heritage sites.

Therefore, there is no requirement to move onto Step 4, as per the Code.

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 NPWS shall be notified.

6. ENVIRONMENTAL AND PLANNING LEGISLATION

6.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

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

The only applicable Environmental Planning Instrument to the proposed development and site is State Environmental Planning Policy (Precincts – Regional) 2021 (SEPP Regional Precincts).

The original Chapter 4 Kosciuszko Alpine Region was based completely (a straight transfer) on the previous State Environmental Planning Policy (Kosciuszko Alpine Resorts) 2007, repealed on the 26 November 2021.

On the 16 December 2022, an entire new Chapter 4 of the SEPP Regional Precincts was gazetted without any formal public exhibition and no explanation of intended effect was publicised.

The key relevant provisions of the new Chapter 4 of the SEPP Regional Precincts have been addressed below.

Section 4.1 Aim and objectives of Chapter:

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

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

Section 4.2 Land to which Chapter applies:

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

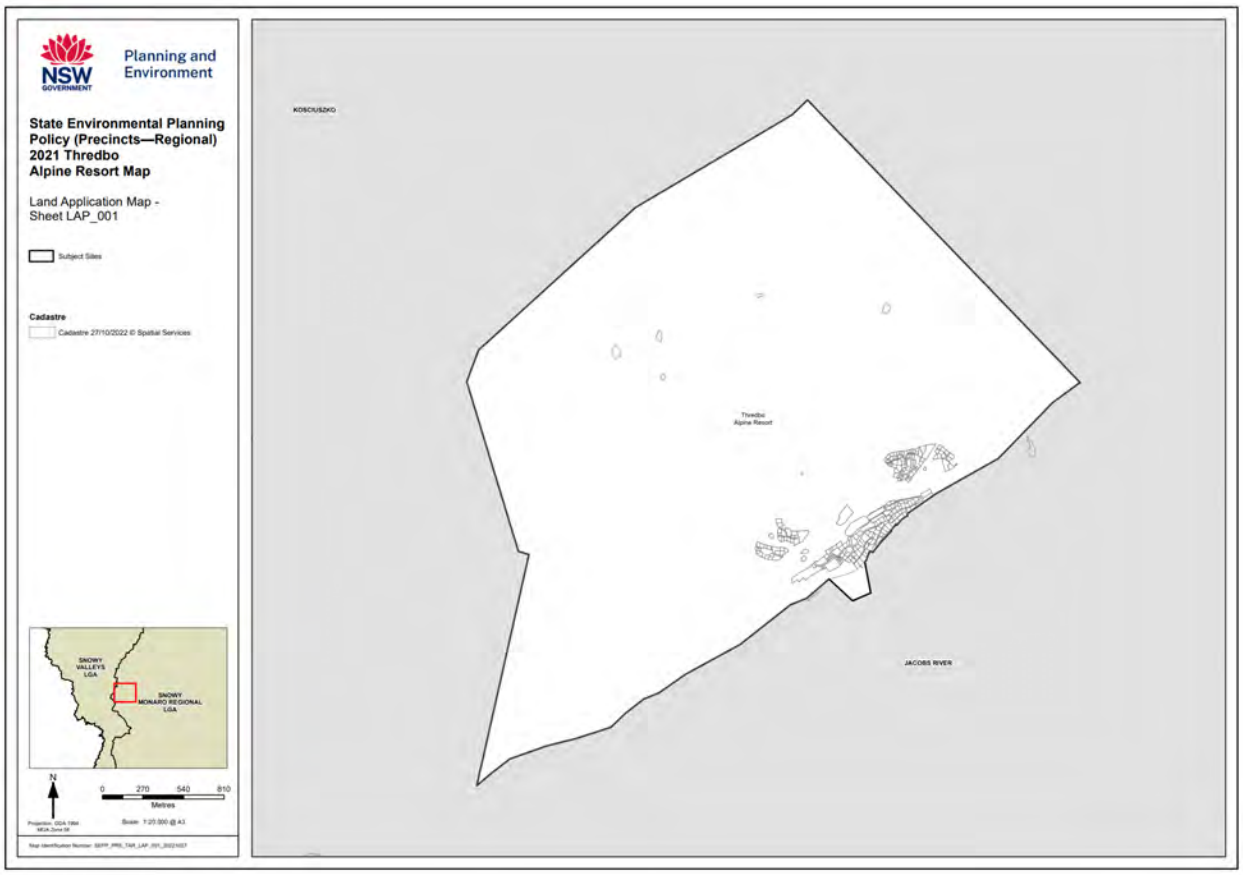


Figure 19: Precincts-Regional SEPP - Thredbo Alpine Resort Sub-Region Map

Section 4.7 - Land Use Table:

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

Section 4.19 Public utility infrastructure

The proposed realigned trail does not require the provision of public utility infrastructure.

Section 4.24 Flood Planning

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

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

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

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

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

Further consideration of Section 4.24 therefore cannot be undertaken.

Section 4.25 Earthworks

Matter for Consideration	Response
(3) In deciding whether to grant development consent for earthworks, or for development involving ancillary earthworks, the consent authority must consider the following matters—	
(a) the likely disruption of, or adverse impact on, drainage patterns and soil stability in the locality of the development,	*The proposal includes ancillary earthworks involved with the construction of the realigned trail.* *Construction of mountain bike trails across the mountain is a common development practice that has demonstrated to have little to no impact on drainage patterns or soil stability, with the trail designed to avoid watercourses and wet areas.*

(b) the effect of the development on the likely future use or redevelopment of the land,	*The effect of the development will have a negligible impact on the future use or redevelopment.*
(c) the quality of the fill or the soil to be excavated, or both,	*The quality of the soil is not likely to change, as it will be reused on site.*
(d) the effect of the development on the existing and likely amenity of adjoining properties,	*The development will have a negligible effect on the existing and likely amenity of adjoining properties, which predominantly comprise of ski slopes and mountain bike trails.*
(e) the source of any fill material and the destination of any excavated material,	*The proposed trail construction does not generally use fill material or require excavated material to be transported off-site.*
(f) the likelihood of disturbing relics,	*This is unlikely as discussed in Section 4.2 above.*
(g) the proximity to, and potential for adverse impacts on, a waterway, drinking water catchment or environmentally sensitive area,	*The subject site is setback over 70m from the closest defined watercourse. There are no defined water catchments or environmentally sensitive areas under the SEPP.*
(h) appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.	*The proposal has been located to avoid any watercourses or wet areas or significant vegetation.* *Furthermore, these impacts can be minimised by way of implementation of the measures outlined in the Site Environmental Management Plan (SEMP).*

Section 4.26 Master plans

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

The SM SAP MAP does not:

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

- Outline limitations on development on certain land: The Master Plan does not show any limitation on development with regard to the subject site, being located on the upper ski slopes of the resort.

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

Section 4.28 – Consideration of master plans and other documents

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

(a) a master plan approved by the Minister under section 4.26 that applies to the land, or	*The SM SAP MP was adopted prior to the new Chapter 4 of the SEPP being adopted, therefore prior to section 4.26.* *The SM SAP MP does not specifically relate to the site or the proposed development and does not include the mandatory information required under section 4.26 of the SEPP.*
(b) if a master plan has not been approved—a draft master plan prepared under section 4.26 that is intended to apply to the land and has been published on the NSW planning portal.	*Not applicable.*

Section 4.29 - Consideration of environmental, geotechnical and other matters

Matter for Consideration	Response
S.4.29 (1) In deciding whether to grant development consent to development in the Alpine Region, the consent authority must consider the following—	
(a) measures proposed to address geotechnical issues relating to the development,	*The proposed trail realignment does not require any structures or platforms to traverse watercourses and therefore only comprises of minor earthworks. A Form 4 is therefore not required and no measures are required to address geotechnical issues.*
(b) the extent to which the development will achieve an appropriate balance between— (i) the conservation of the natural environment, and (ii) taking measures to mitigate environmental hazards, including geotechnical hazards, bush fires and flooding,	*The proposal does not require any measures to mitigate environmental hazards that would impact on the conservation of the natural environment.*
(c) the visual impact of the proposed development, particularly when viewed from the land identified as the Main Range Management Unit in the Kosciuszko National Park Plan of Management	*The proposed works will result in a realigned mountain bike trail in an area that is not visually prominent and mostly screened by existing vegetation.* *Both mountain bike and walking trails are common place in the resort and will not create any additional visual impacts.*
(d) the cumulative impacts of development and resource use on the environment of the Alpine Subregion in which the development is carried out,	*There is no framework provided to assess cumulative impacts. That being said, an assessment of likely impacts of the proposal is provided in Section 6.1.6 of this SEE.*

(e) the capacity of existing infrastructure and services for transport to and within the Alpine Region to deal with additional usage generated by the development, including in peak periods,	*The proposed works will have no impact on the existing transport to and within the resort, as the proposal does not generate additional usage.*
(f) the capacity of existing waste or resource management facilities to deal with additional waste generated by the development, including in peak periods.	*The proposed works will generate minimal waste.*
(2) For development involving earthworks or stormwater draining works, the consent authority must also consider measures to mitigate adverse impacts associated with the works.	*Ancillary excavation works are required for the trail realignment.* *Sedimentation and erosion control measures as outlined in the SEMP provided separately, will mitigate any adverse impacts associated with such works.*
(3) For development the consent authority considers will significantly alter the character of an Alpine Subregion, the consent authority must also consider— (a) the existing character of the site and immediate surroundings, and (b) how the development will relate to the Alpine Subregion.	*The proposed trail realignment will not significantly alter the character of the Thredbo Alpine Subregion.*

Section 4.30 - Kosciuszko National Park Plan of Management

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

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

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

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

There are no Development Control Plans applicable to the Kosciuszko Alpine Resorts under the SEPP Regional Precincts.

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

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

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

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

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

Natural Environment:

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 SEMP, 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 trail realignment to accommodate the future planned redevelopment of the Snowgums Chairlift.

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

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

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

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

Overall, the site is considered suitable for the proposed realigned section of the Kosciuszko Flow Trail.

6.1.8 SECTION 4.15(1)(d) –SUBMISSIONS

The proposed works are located more than 50m from the closest tourist accommodation building and therefore cannot be publicly notified or advertised under the Departments Community Participation Plan, 2019.

In accordance with Table 1, 'no public exhibition will be undertaken for proposals where a site is located more than 50m away from a tourist accommodation building'.

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

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

The proposal is considered to be within the public interest.

6.2 BIODIVERSITY CONSERVATION ACT, 2016

The proposed trail diversions are located within an area predominantly 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 one (1) ecosystem credit and one (1) species credit 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.

7. CONCLUSION

The proposed realignment of the Kosciusko Flow Trail will allow for the plan redevelopment of the Snowgums Chairlift and construction the top station, without restricting the use of the flow trail.

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

This has included inspection of the proposed trail by both DPE 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 Site Environmental Management Plan.

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

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

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

APPENDIX A

PHOTOS

Figure 1: Photo Point 1 (PH1)

Figure 2: : Photo point P2 (PH2)

Figure 3: Photo Point 3 (PH3)

Figure 4: Photo Point 4 (PH4)

Figure 5: Photo Point 5 (PH5)

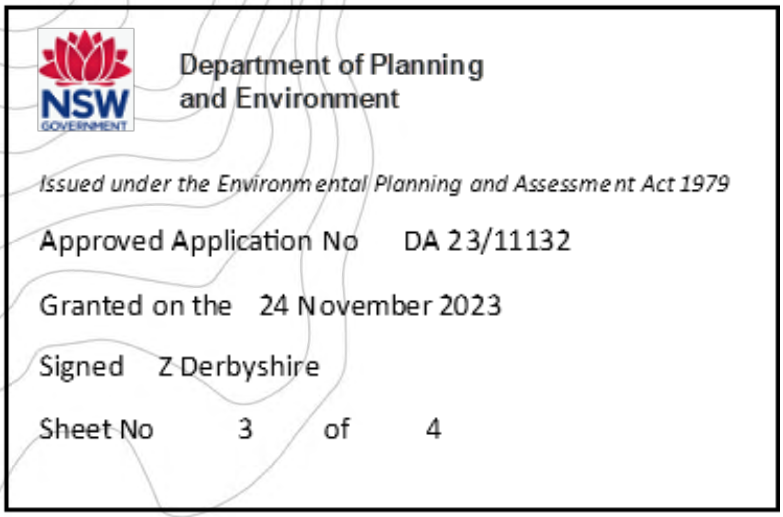
Figure 6: Photo Point 6 (PH6)

APPENDIX B

BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

Proposed Flow Trail Realignment, Thredbo Alpine Resort
Biodiversity Development Assessment Report

Kosciuszko Thredbo Pty Ltd



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DOCUMENT TRACKING

Project Name	Proposed Flow Trail Realignment, Thredbo Alpine Resort
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Project Manager	Ryan Smithers
Accredited Assessor Certification	
Prepared by	Ryan Smithers
Reviewed by	Dave Coombes
Approved by	Ryan Smithers
Status	**Final**
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ACKNOWLEDGEMENTS

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

Template 2.8.1

Executive Summary

Eco Logical Australia Pty Ltd was engaged by Kosciuszko Thredbo Pty Ltd to prepare a BDAR for the proposed minor realignment of the existing Flow mountain bike trail, within Thredbo Alpine Resort. The realignment is proposed to enable the continued use of the Flow trail during the construction of the new Snowgums chairlift.

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). A portion of the native vegetation within the development site is mapped on the Biodiversity Values map.

The proposed development has been located to take advantage of existing disturbed areas and minimize the required clearing as much as is possible. As a result, it is anticipated that the proposal will involve the clearing or further modification of only 0.03 ha of native vegetation, most of which will require the clearing of understorey and groundcovers only.

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 one condition state; good. 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 fauna 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).

This BDAR outlines the measures taken to avoid, minimize 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 one ecosystem credit and one species credit 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
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DPE	NSW Department of Planning and Environment
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FM Act	NSW *Fisheries Management Act 1994*
GIS	Geographic Information System
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Area
NPWS	NSW National Parks and Wildlife Service
NRAR	NSW Department of Natural Resources Access Regulator
NSW	New South Wales
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 37801. 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 predominately comprises native vegetation, with a small portion comprising cleared land and exotic grassland around the Snowgums chairlift top station and the Black Sallees restaurant.

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 realignment of the existing Flow mountain bike trail, to enable the continued use of the trail during the planned construction of the new Snowgums Chairlift. The construction of the proposed trail will result in an expected average disturbance footprint width of 2.5 m. The proposed works are expected to affect 0.03 ha of native vegetation, and about 0.003 ha of exotic grassland and non-vegetated areas.

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 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.
- 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.

The proposal is further identified in Figure 3 and Photo 1 – Photo 3.

Photo 1: The proposed enters the woodland just below the existing Merritts Nature Trail.

Photo 2: The proposed trail will come close to the Merritts Nature Trail before turning and heading south towards the existing Flow trail.

Photo 3: The realignment will rejoin the existing Flow Trail just below the Black Sallees restaurant.

1.3. Development site footprint

It is anticipated that the proposed development will result in the removal or modification of 0.03 ha of native vegetation. Approximately 0.003 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		
Precincts - Regional SEPP 2021	State Environmental Planning Policy (Precincts—Regional) 2021 (Precincts-Regional SEPP) facilitates a planning framework for Special Activation Precincts (Precinct/s) in regional NSW, streamlining planning processes and guiding the delivery of the precincts. The Precincts-Regional SEPP identifies the Minister for Planning as the determining authority for development within the NSW Alpine Resorts. Precincts-Regional SEPP requires the Minister for Planning to refer for comment any development application in the Alpine Resorts to the Director General of the NSW National Parks and Wildlife Service (NPWS).	-
Snowy River Shire Local Environment Plan 2013	The subject site is zoned C1 National Parks and Nature Reserves under the Snowy River Shire Local Environment Plan 2013.	-

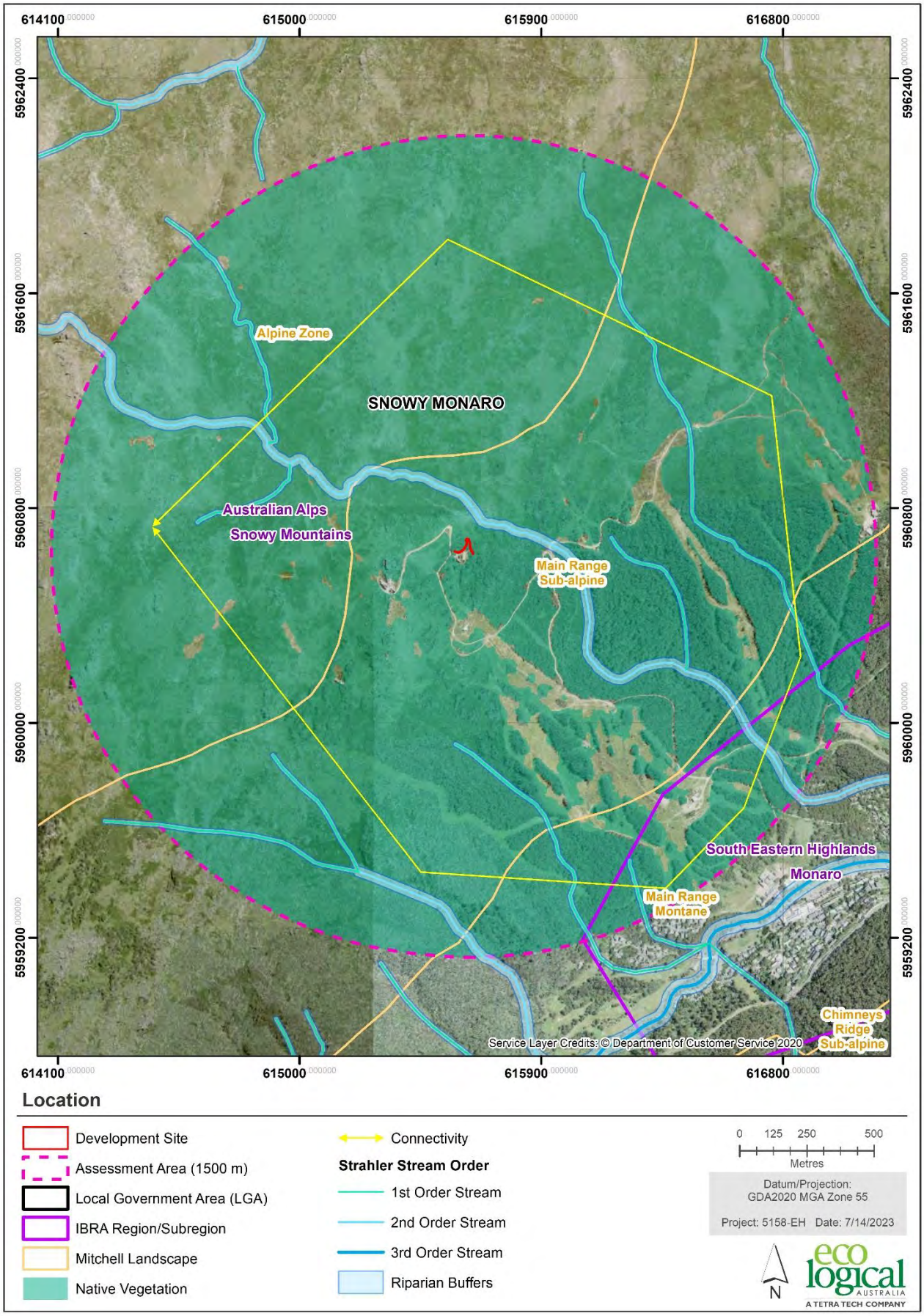

Figure 1: Location Map

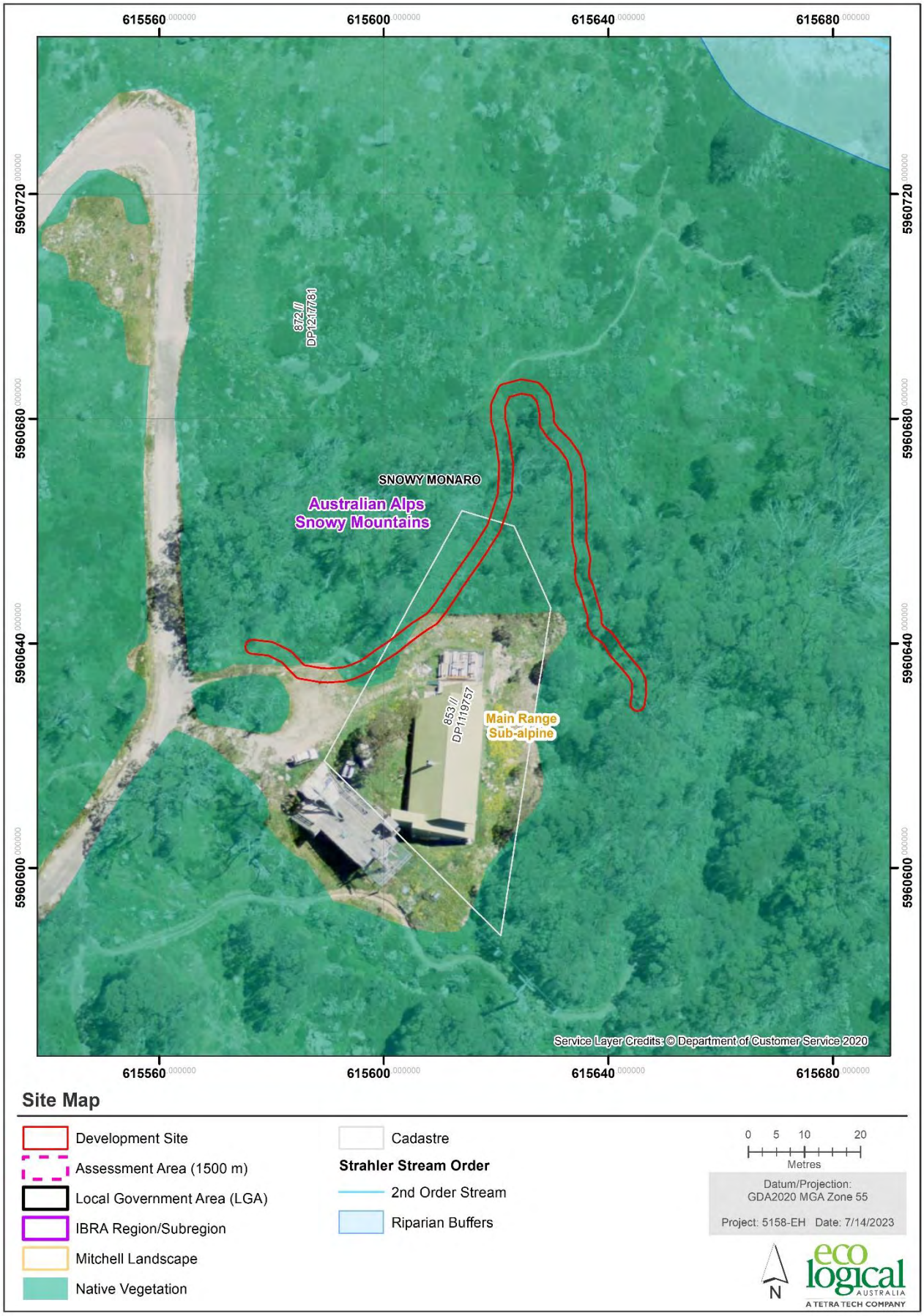

Figure 2: Site Map

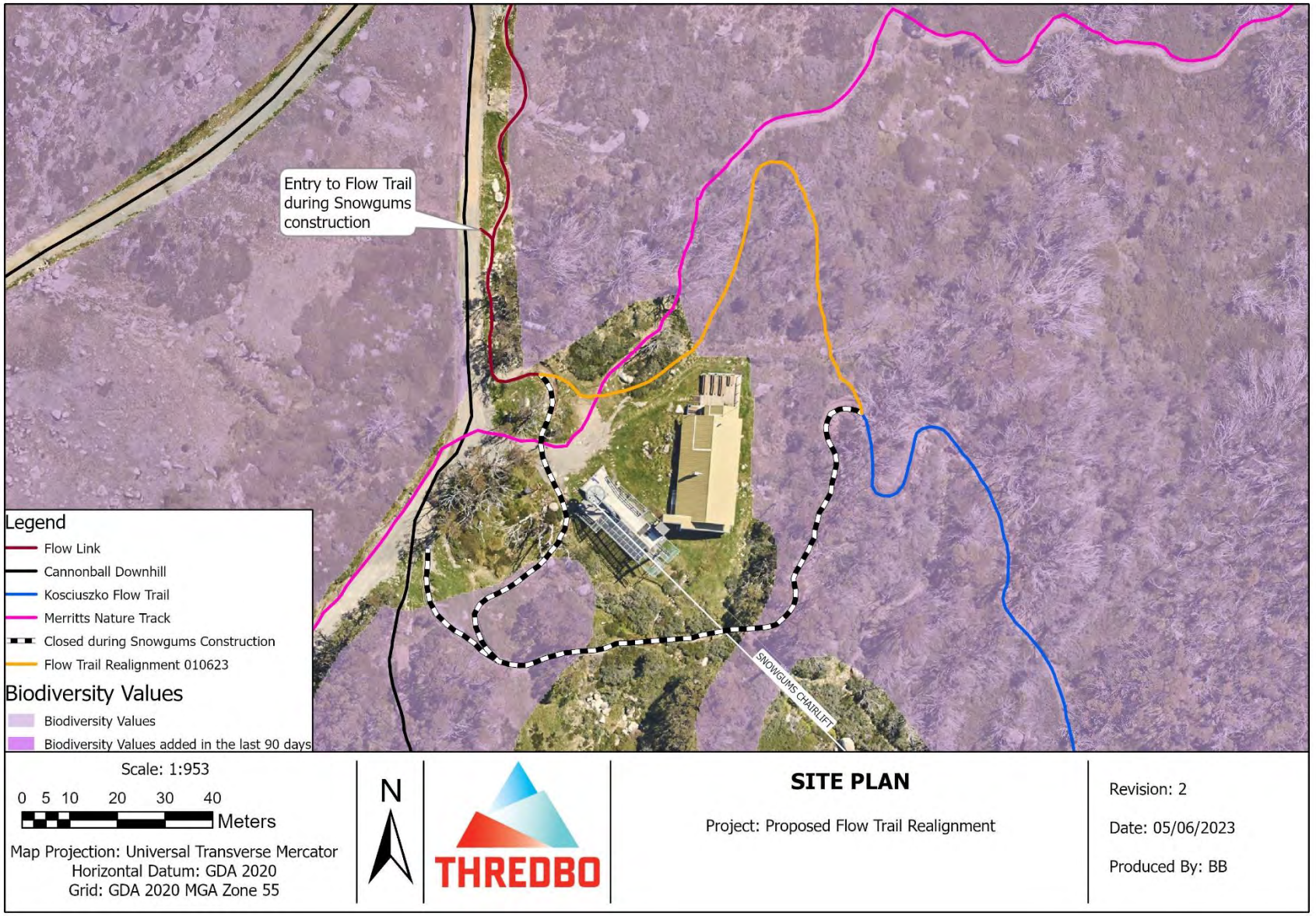

Figure 3: The proposal

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.	Merritts Creek and other watercourses that are tributaries of the Thredbo River.	NSW LPI Waterway mapping
Estuaries and wetlands	No	No	NSW directory of important wetlands
Connectivity of different areas of habitat	The development site is connected to vast areas of native vegetation.	No	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.	No	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	-	NSW (Mitchell) Landscapes - version 3.1 (DPIE 2016)
Percent (%) native vegetation extent	95	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 31 March 2023 (Figure 4).

One full-floristic vegetation plot was surveyed to identify Plant Community Types (PCTs) and Threatened Ecological Communities (TECs) on the development site (Table 3). One vegetation integrity survey plot was 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	1

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 its 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	0.03	5

3.3.1. Plant Community Type selection justification

In determining the PCTs 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	644

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	-	-	Not listed	-	-

3.5. Vegetation integrity assessment

3.5.1. Vegetation zones

One vegetation zone was identified within the development site, as shown in Figure 5. A total of one vegetation integrity survey plot was collected within the development site, which is consistent with the BAM (Table 7). A description of the vegetation zone is provided in Table 8.

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 9.

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	0.03	101	1	1
			Total	0.03	101	1	1

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 typically a woodland to an open woodland with a variable but often high shrub cover. Within the zone there is considerable dieback of *Eucalyptus niphophila.*		
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	20		
Exotic species / HTW cover	*Acetosella vulgaris, Hypochaeris radicata* - low		
Condition	Good		
Variation and disturbance	PCT 645 is in good condition within the zone with minor variations in shrub cover.		
No. sites sampled	1		
Threatened flora species	-		
Fauna habitats	Broad-toothed Rat and Flame Robin.		
Composition	**Structure**	**Function**	**Vegetation Integrity Score**
62.4	64.4	47.1	57.4

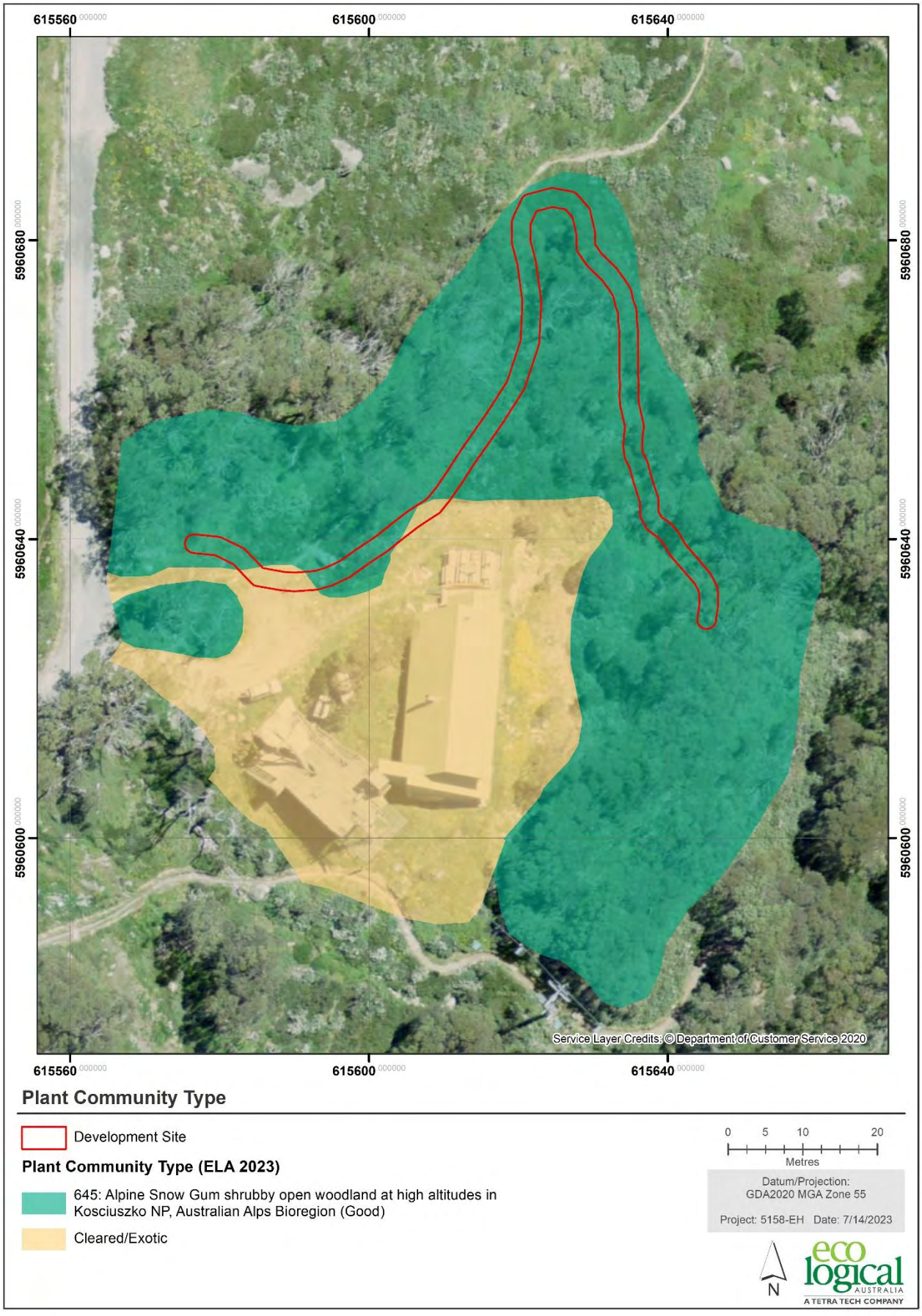

Figure 4: Plant Community Types

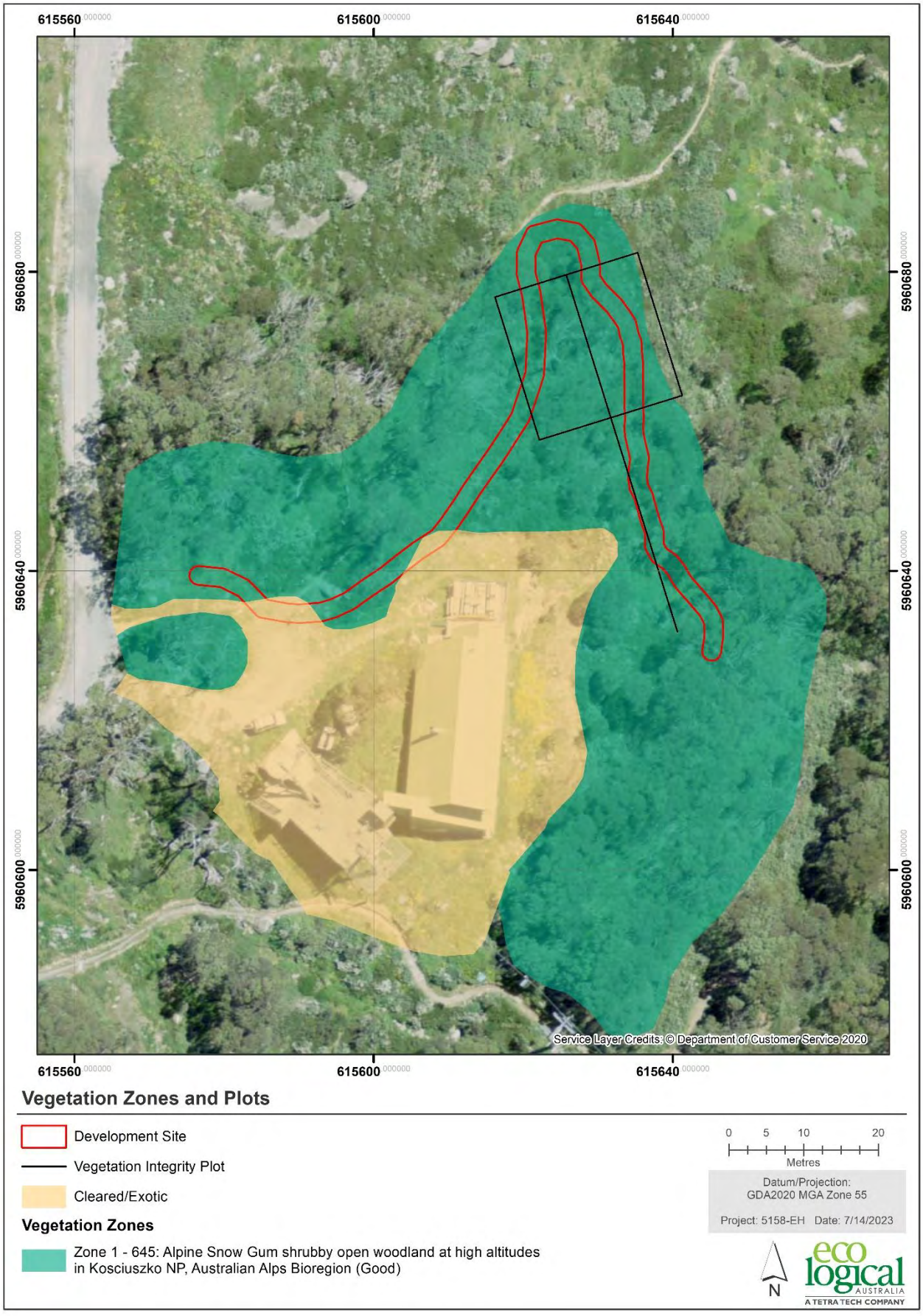

Figure 5: Vegetation Zones and Plots

Table 9: 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	0.03	62.4	64.4	47.1	No	57.4

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 10.

Table 10: 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	Endangered
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 11.

Table 11: Candidate species credit species

Species	Common Name	Habitat Constraints	Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status
Mastacomys fuscus	Broad-toothed Rat	-	-	High	Vulnerable	Vulnerable
Pseudophryne corroboree	Southern Corroboree Frog	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 12.

Table 12: 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
Pseudophryne corroboree	Southern Corroboree Frog	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

One species credit species required further assessment following site survey to assess the condition of the development site and the presence of microhabitats: *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. One species credit species, the Broad-toothed Rat, was incidentally recorded within the development site or immediate surrounds and was added as candidate species.

Targeted surveys for relevant threatened species known from locality were undertaken within the development site and immediate surrounds on the dates outlined in Table 13. Weather conditions during the targeted surveys are outlined in Table 14 and survey effort is outlined in Table 15.

Table 13: Targeted surveys

Date	Surveyors	Target species
31 March 2023	Ryan Smithers	Broad-toothed Rat and Anemone Buttercup

Table 14: Weather conditions

Date	Rainfall (mm)	Minimum temperature 0C	Maximum temperature 0C
31 March 2023	-	10	12

Table 15: Survey effort

Method	Habitat (ha)	Stratification units	Total effort	Target species
Targeted searches	Approx. 0.1 ha	Suitable habitats within and immediately surrounding the development site	0.5 person hours	Broad-toothed Rat
Targeted threatened flora searches	Approx. 0.1 ha	Suitable habitats within and immediately surrounding the development site	0.5 person hours	Anemone Buttercup

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.

Following completion of field surveys, the species credit species included in the assessment are outlined in Table 16**.**

Table 16: Species credit species included in the assessment

Species	Common Name	Species presence	Geographic limitations	Habitat (ha) / count	Biodiversity Risk Weighting
Mastacomys fuscus	Broad-toothed Rat	Yes	-	0.03	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.

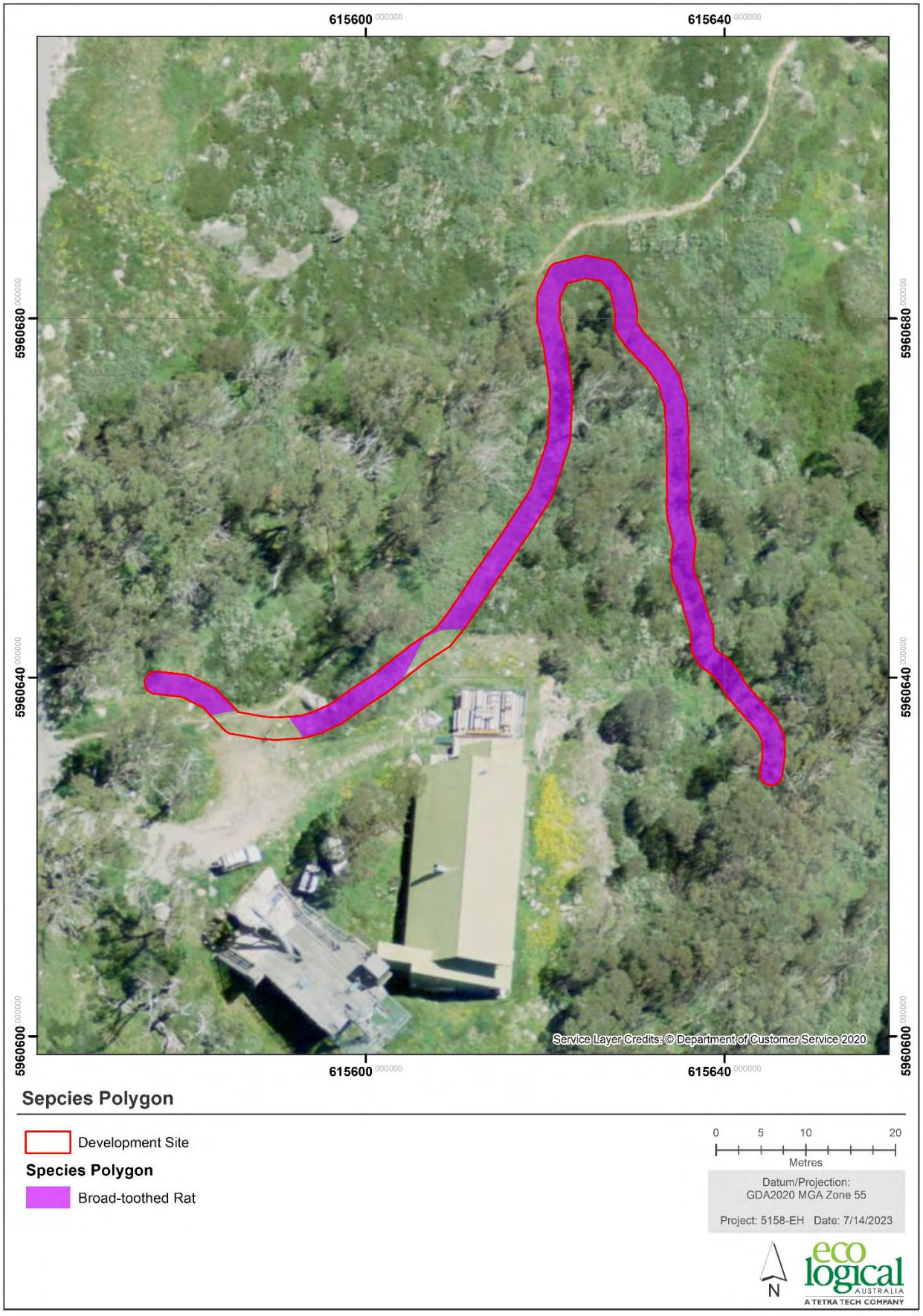

Figure 6: Species polygons

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:

- Minimising the length of the proposed trail.
- Minimising the disturbance footprint associated with construction.
- Locating the trail to minimise impacts on less disturbed native vegetation.
- Locating the trail to avoid wet areas.
- 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 17.
- Threatened species and threatened species habitat is outlined in Table 18.
- Prescribed biodiversity impacts is outlined in Section 6.4.

Table 17: 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	0.03

Table 18: 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	0.03	Vulnerable	Vulnerable

6.2. Change in vegetation integrity

The change in vegetation integrity as a result of the development is outlined in Table 19.

Table 19: 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	0.03	57.4	0	-57.4

6.3. Indirect impacts

The indirect impacts of the development are outlined in Table 20. 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 10 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.

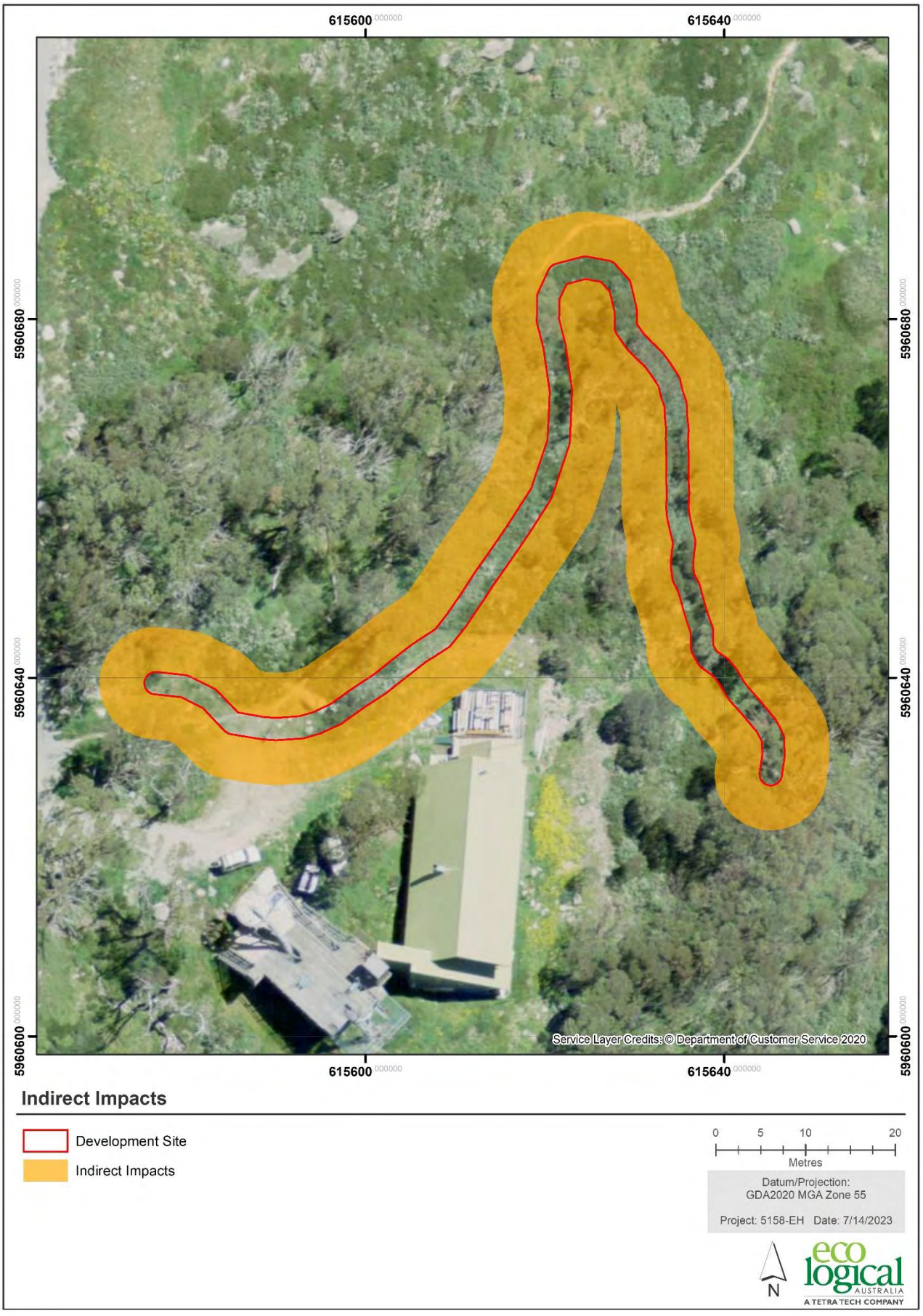

Figure 7: Indirect impact zones

Table 20: 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	During construction	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. Any vehicles used during construction 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	During construction	Not expected
Trampling of threatened flora species	Construction	Minor. There are no threatened flora species within the development site.	Minor	Not expected	During construction	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	During construction	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 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 21.

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 21: 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 the alignment of the trail, where the trail 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 22 and shown on Figure 8. The impacts of the development requiring offset for species credit species and their habitats are outlined in Table 23 and on Figure 8.

Table 22: 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	0.03

Table 23: 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	0.03	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.

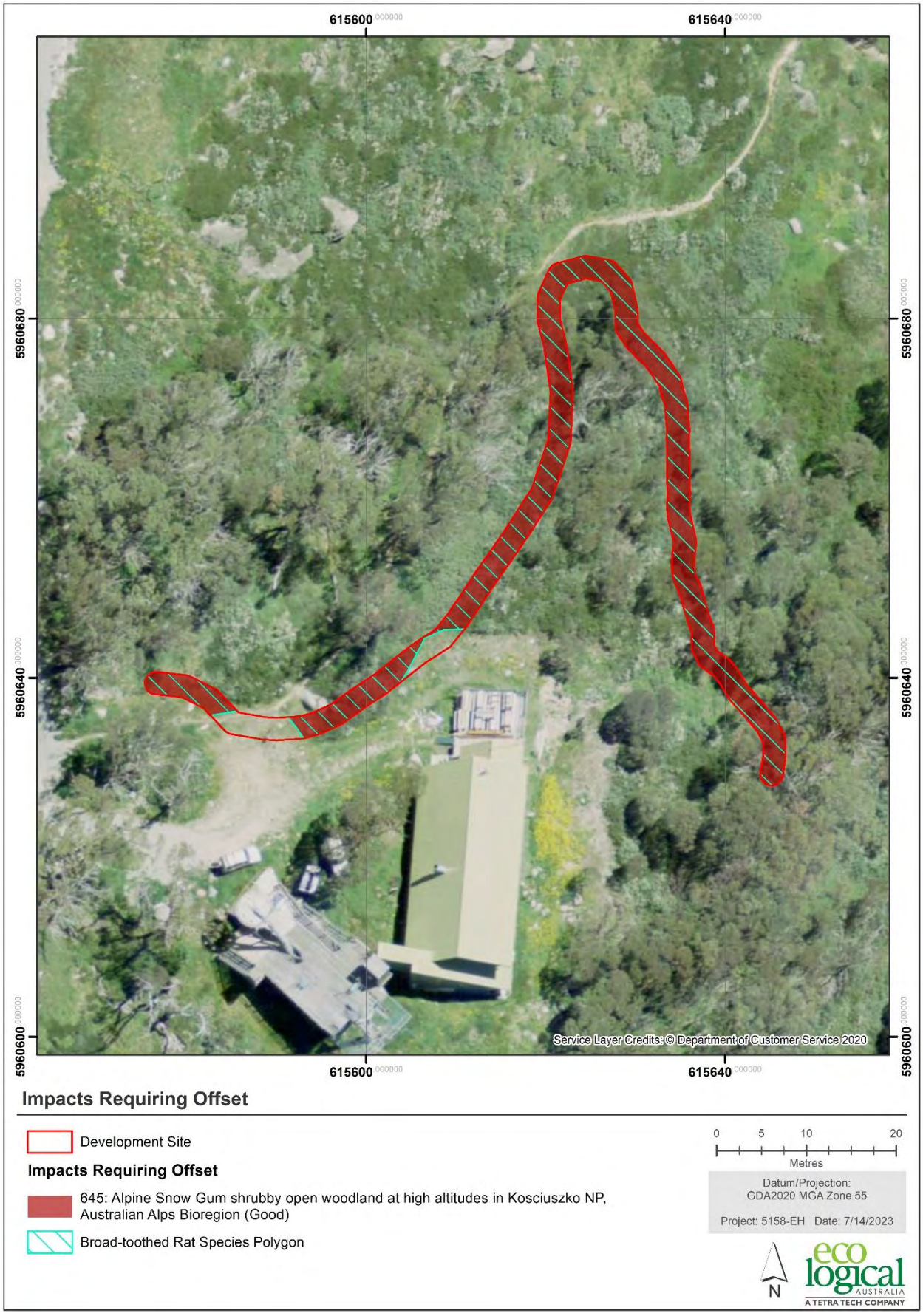

Figure 8: Impacts requiring offset

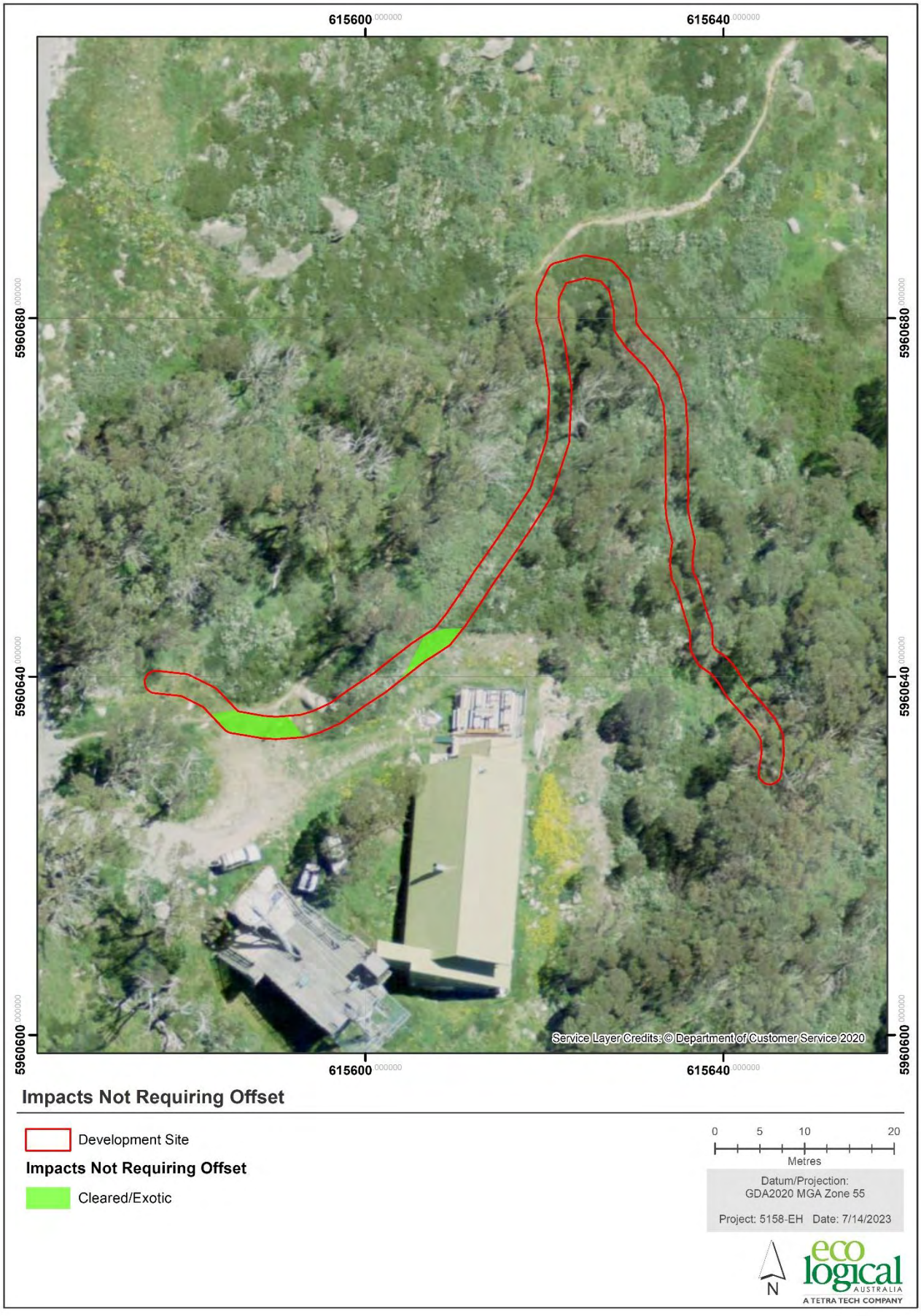

Figure 9: Impacts not requiring offset

7.5. Credit summary

The number of ecosystem credits required for the development are outlined in Table 24.

The number of species credits required for the development are outlined in Table 25.

A biodiversity credit report is included in Appendix F.

Table 24: 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	0.03	1

Table 25: Species credit summary

Species	Common Name	Direct impact number of individuals / habitat (ha)	Credits required
Mastacomys fuscus	Broad-toothed Rat	0.03	1

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:

- Broad-toothed Rat

The outcome of this assessment was that it is highly unlikely that the development would significantly impact on the Broad-toothed Rat (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 21 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 realignment of the Flow mountain bike trail, within 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 one ecosystem credit and one species credit 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.

11. References

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

Family	Species	Common Name	Listing Status	ROTAP	Exotic	High Threat Weed	Growth Form Group	Plot 1		
								Stratum	Cover	Abundance
Rosaceae	*Acaena* sp. Thredbo River Gorge (L.A.S.Johnson & E.F.Constable s.n., 19 Jan 1951)	-	-	-	-	-	Forb (FG)	g	0.2	5
Polygonaceae	*Acetosella vulgaris*	Sheep Sorrel	-	-	Yes	Yes	-	g	0.1	20
Poaceae	*Agrostis capillaris*	Browntop Bent	-	-	Yes	Yes	-	g	0.1	5
Ericaceae	*Acrothamnus montanus*	-	-	-	-	-	Shrub (SG)	m	0.1	1
Rubiaceae	*Asperula gunnii*	Mountain Woodruff	-	-	-	-	Forb (FG)	g	0.2	50
Cyperaceae	*Carex bichenoviana*	-		-	-	-	Grass & grasslike (GG)	g	0.1	20
Asteraceae	*Celmisia pugioniformis*	-		-	-	-	Forb (FG)	g	0.1	10
Asteraceae	*Coronidium scorpioides*	Button Everlasting		-	-	-	Forb (FG)	g	0.1	5
Phormiaceae	*Dianella tasmanica*	-	-	-	-	-	Forb (FG)	g	0.1	1
Myrtaceae	*Eucalyptus niphophila*	-	-	-	-	-	Tree (TG)	u	25	20
Geraniaceae	*Geranium potentilloides* var. *potentilloides*	-	-	-	-	-	Forb (FG)	g	0.1	2
Asteraceae	*Hypochaeris radicata*	Catsear	-	-	Yes	-	-	g	0.1	5
Rutaceae	*Nematolepis ovatifolia*	-		-	-	-	Shrub (SG)	m	2	5
Asteraceae	*Olearia phlogopappa.*	-	-	-	-	-	Shrub (SG)	m	3	20
Fabaceae (Faboideae)	*Oxylobium ellipticum*	Common Shaggy Pea	-	-	-	-	Shrub (SG)	g	1	10
Asteraceae	*Ozothamnus secundiflorus*	Cascade Everlasting	-	-	-	-	Shrub (SG)	m	50	30
Thymelaeaceae	*Pimelea axiflora* subsp. *alpina*	-	-	-	-	-	Shrub (SG)	m	0.3	3
Poaceae	*Poa ensiformis*	Purple-sheathed Tussock-grass	-	-	-	-	Grass & grasslike (GG)	g	3	100

Family	Species	Common Name	Listing Status	ROTAP	Exotic	High Threat Weed	Growth Form Group	Plot 1		
								Stratum	Cover	Abundance
Poaceae	*Poa fawcettiae*	Smooth Blue Snowgrass	-	-	-	-	Grass & grasslike (GG)	g	15	500
Dryopteridaceae	*Polystichum proliferum*	Mother Shield Fern	-	-	-	-	Fern (EG)	g	0.1	1
Asteraceae	*Senecio gunnii*	-	-	-	-	-	Forb (FG)	g	0.1	1
Caryophyllaceae	*Stellaria pungens*	Prickly Starwort	-	-	-	-	Forb (FG)	g	1	50
Winteraceae	*Tasmannia xerophila* subsp. *xerophila*	Alpine Pepperbush	-	-	-	-	Shrub (SG)	m	0.3	1

Appendix C - Vegetation Integrity Plot Data

Table 27: Plot location data

Plot no.	PCT	Condition	Easting	Northing	Bearing
1	645	Good	615624	5960663	160

Table 28: Vegetation integrity data (composition)

Composition (number of species)						
Plot	Tree	Shrub	Grass	Forb	Fern	Other
1	1	7	3	8	1	0

Table 29: Vegetation integrity data (Structure)

Structure (Total cover)						
Plot	Tree	Shrub	Grass	Forb	Fern	Other
1	25	56.7	18.1	1.9	0.1	0

Table 30: 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	0	0	79.2	22	1	1	1	0	0	1	0.1

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:

- 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;	No. The development footprint does not provide potential habitat for any Commonwealth listed endangered species.
Any impact on Commonwealth Listed Vulnerable Species;	Yes. The development footprint 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 (0.03 ha) 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 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.

Matters to be considered	Impact
	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. 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 are 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. Invasive 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 scats 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.
Any environmental impact on a Commonwealth Marine Area;	No. There are no Commonwealth Marine Areas within the study area.

Matters to be considered	Impact
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 25 years' experience in natural resource management. 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 many 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

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00037801/BAAS17061/23/00037802

Proposal Name
Flow trail diversion

BAM data last updated *
22/06/2023

Assessor Name
Ryan Smithers

Assessor Number
BAAS17061

BAM Data version *
61

Proponent Names

Report Created
08/08/2023

BAM Case Status
Finalised

Assessment Revision
0

Assessment Type
Part 4 Developments (Small Area)

Date Finalised
08/08/2023

BOS entry trigger
BOS Threshold: Biodiversity Values Map

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
645-Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Not a TEC	0.0	0	1	1

BAM Biodiversity Credit Report (Like for like)

645-Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Like-for-like credit retirement options					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Subalpine Woodlands This includes PCT's: 644, 645, 650, 677, 679, 952, 1190, 1191, 1196, 1199, 3379, 3380, 3381, 3382, 3383, 3384, 3385	Subalpine Woodlands <50%	645_Good	No	1	Snowy Mountains, Bondo, Monaro, Murrumbateman, Snowy Mountains and South East Coastal Ranges. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Mastacomys fuscus / Broad-toothed Rat	**645_Good**	0.0	1.00

Credit Retirement Options

Like-for-like credit retirement options

Mastacomys fuscus / Broad-toothed Rat	Spp	IBRA subregion
	Mastacomys fuscus / Broad-toothed Rat	Any in NSW

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APPENDIX C

ABORIGINAL CULTURAL HERITAGE DUE DILLIGENCE ASSESSMENT

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 08-23

Client Service ID : 768727

dabyne planning

Date: 29 March 2023

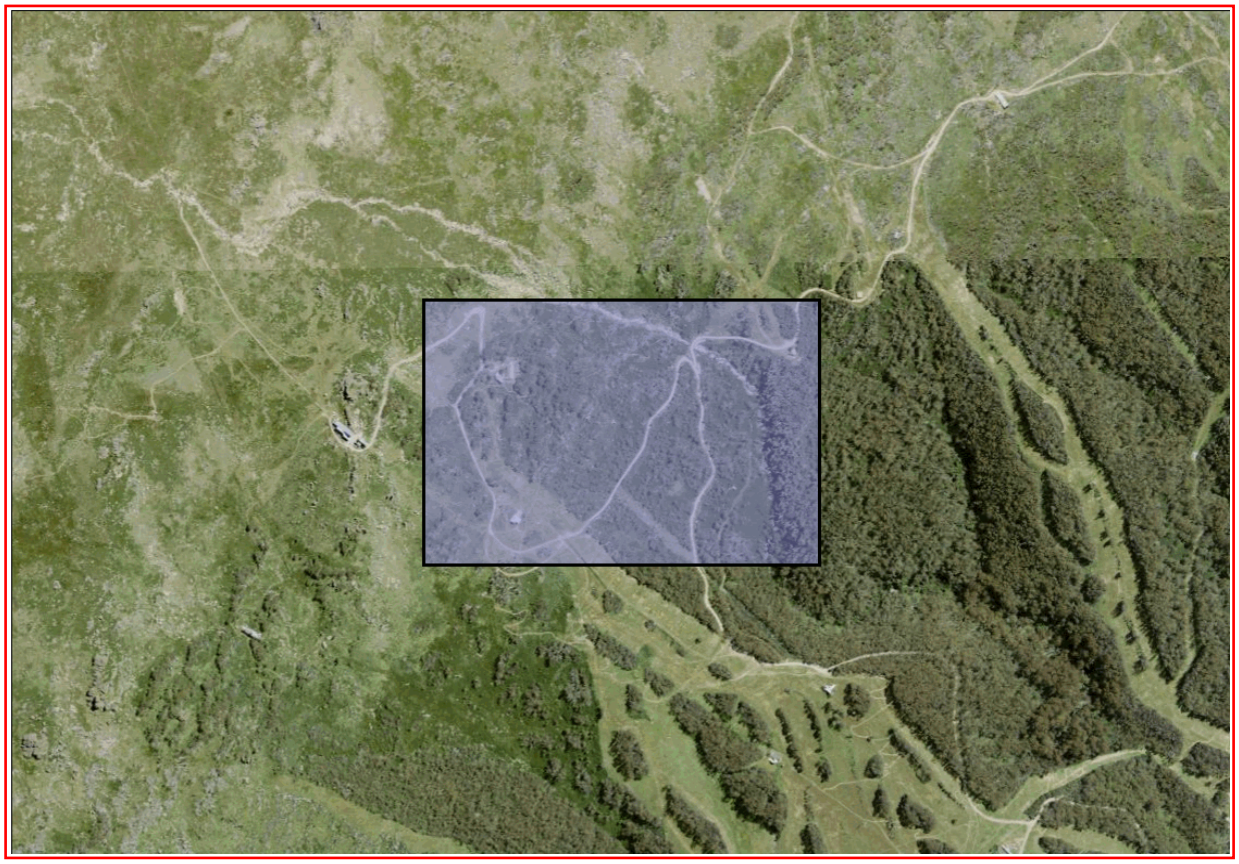
Attention: Ivan Pasalich

Email: ivan@dabyneplanning.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -36.4959, 148.2891 - Lat, Long To : -36.4916, 148.2969, conducted by Ivan Pasalich on 29 March 2023.

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



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

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

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

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

Important information about your AHIMS search

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

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