Leichhardt J-Bar, Perisher Ski Resort
Biodiversity Development Assessment Report

Perisher Blue Pty Ltd

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DOCUMENT TRACKING

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Template 2.8.1

Executive Summary

Eco Logical Australia Pty Ltd was engaged by Perisher Blue Pty Ltd to prepare a BDAR for the proposed replacement of the existing Home Rope Tow lift with a new J-bar lift and associated works in the Centre Valley area of Perisher Ski Resort.

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). Some 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 disturbance. As a result, it is anticipated that the proposal will involve the removal or further modification of only 0.06 ha of native vegetation.

The development footprint supports three Plant Community Types: (PCT) PCT 637 Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion; PCT 645 Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion; and PCT 643 Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion. PCT 637 is considered to comprise the *Montane Peatland and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions* endangered ecological community (EEC) (hereafter referred to as the Montane Peatland and Swamps) which is listed on the BC Act. It also comprises the *Alpine Sphagnum Bogs and Associated Fens* EEC (hereafter referred to as the Alpine Sphagnum Bogs and Associated Fens) which is listed as an EEC on 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) and *Cyclodomorphus praealtus* (Alpine She-oak Skink). Despite targeted surveys, no evidence of *Liopholis guthega* (Guthega Skink) was detected within the development site or immediate surrounds. The endangered *Rytidosperma vickeryae* (Perisher Wallaby Grass) was detected near the proposed bottom station and the proposal design was subsequently altered to avoid this location and any impacts on the species.

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

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

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

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Abbreviations

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

1. Introduction

This Biodiversity Development Assessment Report (BDAR) has been prepared by Ryan Smithers, an Accredited Person (BAAS17061) to apply the Biodiversity Assessment Method (BAM) under the NSW *Biodiversity Conservation Act 2016* (BC Act). All credit calculations have been undertaken using the BAM Calculator (BAMC) version 2020 in case number 33734. Consistent with the BAM, the streamlined (small area) assessment module has been used for this assessment.

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

1.1. General description of the development site

The development site comprises existing ski slopes and remnant native vegetation in the Centre Valley area of Perisher Ski Resort. Parts of the development site are already heavily modified in association with existing ski slopes and associated infrastructure (i.e. access roads), however the majority of the development site comprises relatively undisturbed native vegetation.

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 the replacement of the existing Home Rope Tow lift with a new J-bar lift and associated works. The replacement of the existing lift will be easier to use and will substantially increase lifting capacity. The alignment of the new lift has been altered from the current rope tow to improve operational outcomes and to avoid and minimise environmental impacts. Following initial analysis, the alignment of the lift was altered with the top station moved approximately 10 m further south, closer to the drier, less sensitive vegetation, to avoid and minimise impacts.

The proposed works that do not include trenching will be undertaken with a small rubber-tracked 6-tonne excavator to minimise disturbance where access across sensitive vegetation communities, such as bog, is required. Rubber mats will also be used where machinery access across bog is necessary. The primary construction access will be via the existing Leichhardt access road and the existing access track to the Home Rope Tow offload. Rock removal that cannot be undertaken from the existing or proposed construction access, will be undertaken over-snow.

To minimise impacts the underground up-hill safety line and new electricity cable will be installed by way of under-boring between the bottom station and Tower 3. This avoids trenching through bog. Between Tower 3 and top station bullwheel, the cables will be installed through trenching in the less sensitive drier vegetation and has been co-located with the proposed construction access. The proposed works will result in a disturbance footprint up to 3.5 m wide for the construction access tracks. The footprint for the Bottom Station and Top Station will each be 8 m by 5 m. The lift tower footprints will be 4 m by 4 m, with the exception on Tower 1 which will be 3 m by 3 m, being located adjacent to the existing Leichhardt access road.

The proposed works are expected to be completed over a two month period and to affect 0.06 ha of native vegetation, much of which is already disturbed. The works will include the progressive reinstatement of excavated material using the sod replacement technique and post construction rehabilitation. The exception being a wheeled vehicle track to be retained between Tower 3 and the Top Station.

The proposal is further identified in Figure 3 and Photo 1 – Photo 6. Figure 4 shows the original proposed lift alignment and the revised alignment. The proposal is further described in the Statement of Environmental Effects (SEE) which has been prepared (Dabyne Planning 2022).

1.3. Development site footprint

It is anticipated that the proposed development will result in the further disturbance of 0.06 ha of native vegetation, parts of which are already heavily modified.

The development site footprint is identified in Figure 2.

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. Chapter 4 Kosciuszko National Park and Alpine Resorts (SEPP Precincts-Regional 2021) identifies the Minister for Planning as the determining authority for development within the NSW Alpine Resorts. Precincts-Regional SEPP requires the Minister for Planning to refer for comment any development application in the Alpine Resorts to the Director General of the NSW Department of Environment and Climate Change (DECC).	-
Snowy River Shire Local Environment Plan 2013	The subject site is zoned E1 National Parks and Nature Reserves under the Snowy River Shire Local Environment Plan 2013.	-

Photo 1: The proposed lift alignment from the Bottom Station. The location of Tower 1 was modified to avoid a patch of Perisher Wallaby Grass.

Photo 2: The proposed Top Station, which was relocated to reduce impacts.

Photo 3: Construction access to the top station will be located in a well-drained area, avoiding the bog and wet heath along the lift alignment. The communications and electricity cables and safety line will be installed beneath the construction access (through trenching) to minimise impacts. The heavily dieback effected trees along the construction access will be removed with any basal suckering either retained or in some instances poisoned.

Photo 4: The construction access will utilise the existing access track to the Home Rope Tow offload.

Photo 5: Temporary construction access using a rubber mat to minimise impacts on vegetation will provide access from the Leichhardt access road to the proposed Tower 2.

Photo 6: The heavily dieback effected trees identified above will be removed. Any regrowth that may occur will either be poisoned or left to regrow as identified in Figure 3.

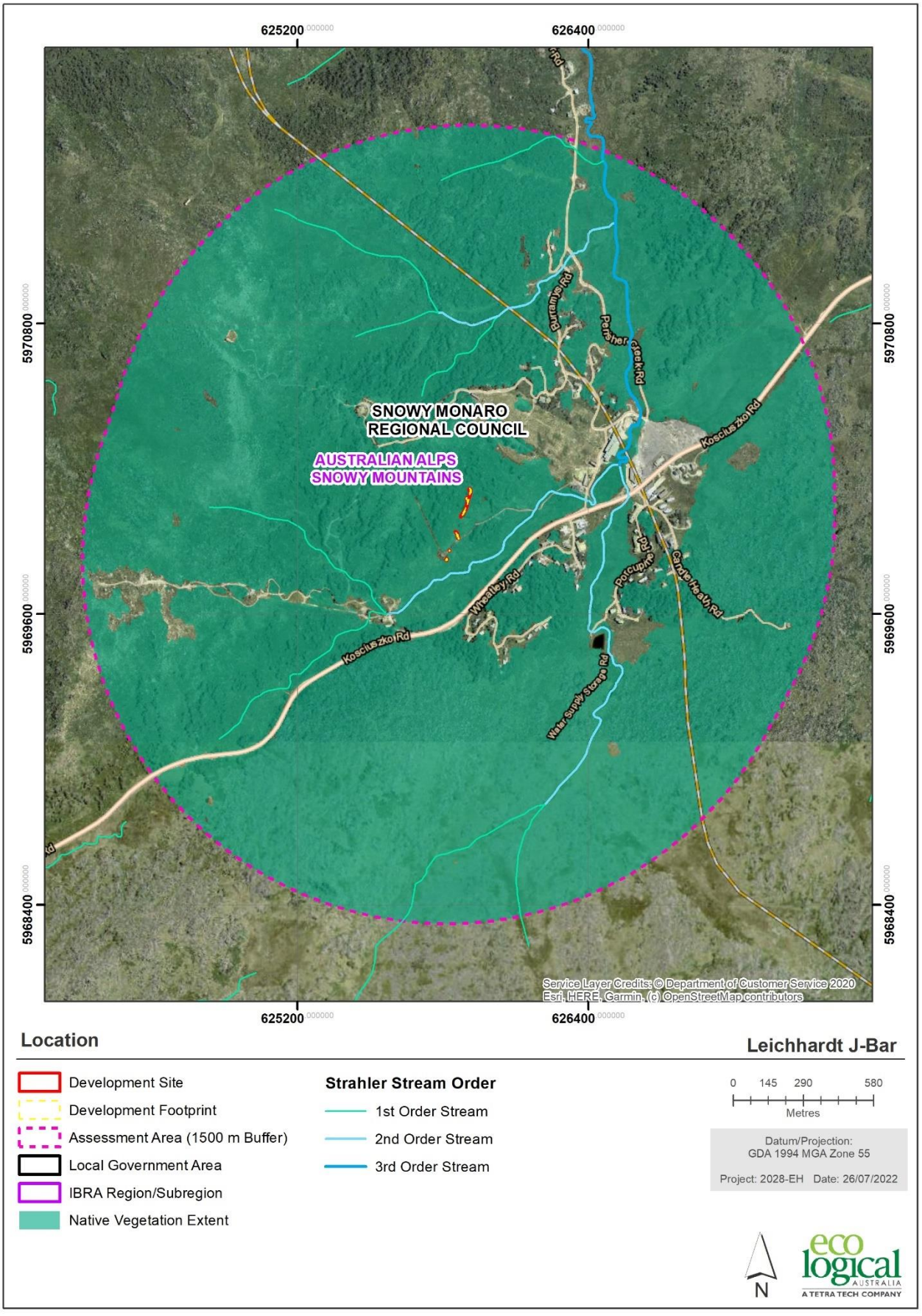

Figure 1: Location map

Figure 2: Site map

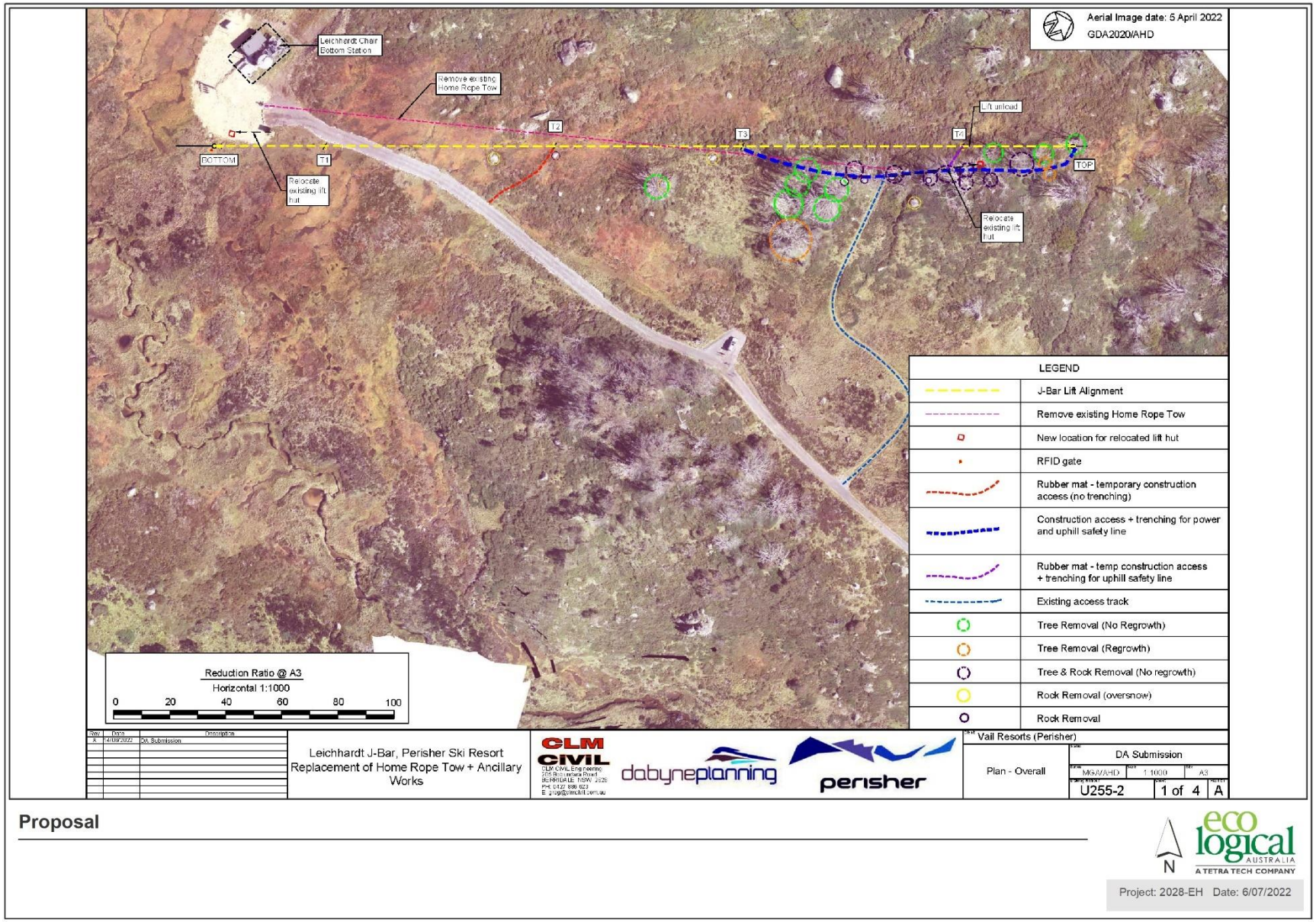

Figure 3: The proposal (as identified in the SEE)

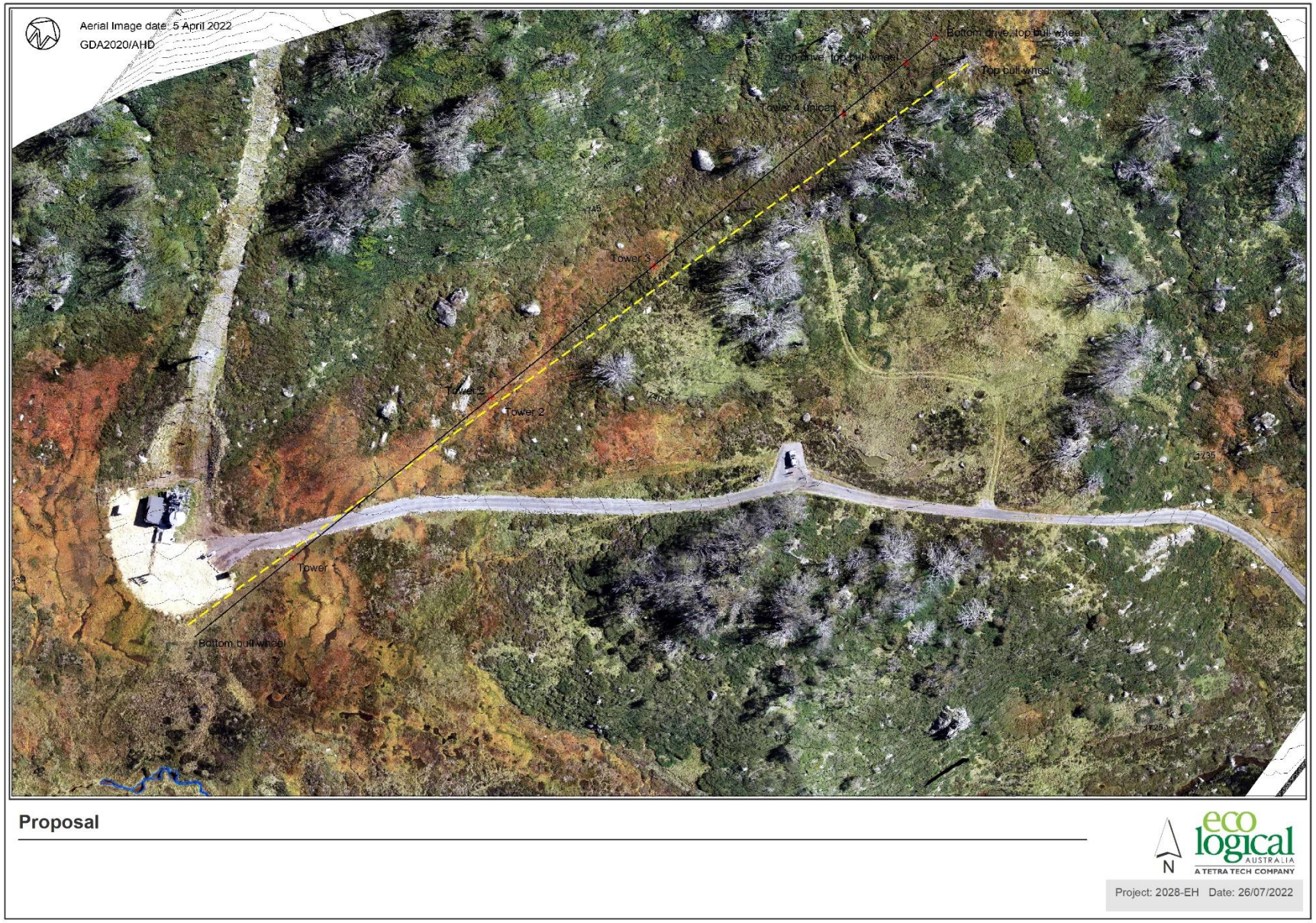

Figure 4: The original proposed alignment (black line) and the revised alignment (yellow dash)

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	Minor unmapped watercourses that are tributaries of Perisher Creek.	Minor unmapped watercourses that are tributaries of Perisher Creek.	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	90	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 21 March and 24 April 2022.

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

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

Table 3: Full-floristic PCT identification plots

PCT ID	PCT Name	Number of plots surveyed
637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	1
645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	1
643	Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, 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

Four PCTs were identified within the development site or immediate surrounds as shown in Table 3. Further detail with respect to the PCTs identified within the development site is presented in Table 4, and their distribution identified in Figure 5.

Table 4: Plant Community Types

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Area within the development site (ha)	Percent cleared
637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Alpine Bogs and Fens	Alpine Complex	0.02	5
645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Grassy Woodlands	Subalpine Woodlands	0.04	5
643	Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion	Alpine Heaths	Alpine Complex	0.004	0
641	Alpine grassland/herbfield and open heathlands in Kosciuszko National Park, Australian Alps Bioregion	Alpine Herbfields	Alpine Complex	0	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
637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	-
645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	-
643	Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion	-
641	Alpine grassland/herbfield and open heathlands in Kosciuszko National Park, Australian Alps Bioregion	-

3.4. Threatened Ecological Communities

PCT 637 is considered to comprise the *Montane Peatland and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions* endangered ecological community (EEC) (hereafter referred to as the Montane Peatland and Swamps), which is listed on the BC Act. It also comprises the *Alpine Sphagnum Bogs and Associated Fens* EEC (hereafter referred to as the Alpine Sphagnum Bogs and Associated Fens) which is listed on the EPBC Act, as identified in Table 6 and Figure 7.

Table 6: Threatened Ecological Communities

PCT ID	BC Act			EPBC Act		
	Listing status	Name	Area (ha)	Listing status	Name	Area (ha)
637	Endangered	Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	0.02	Endangered	Alpine Sphagnum Bogs and Associated Fens	0.02

3.5. Vegetation integrity assessment

3.5.1. Vegetation zones

Four vegetation zones were identified within the development site or immediate surrounds based on the broad condition states of PCT 637, 645, 643 and 641, as shown in Figure 6. Only three of the zones occur within the development site, and subsequently a total of three vegetation integrity survey plots were collected on the development site, which is consistent with the BAM (Table 7). Descriptions of vegetation zones are provided in Tables 8-11Table 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.

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	637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Good	0.02	>101	1	1
2	645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Good	0.04	>101	1	1
3	643	Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion	Good	0.004	>101	1	1
4	641	Alpine grassland/herbfield and open heathlands in Kosciuszko National Park, Australian Alps Bioregion	Good	0	>101	0	0
			Total	0.064	101	3	3

Table 8: Zone 1 PCT 637 Good Condition

637 - Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion			
Vegetation formation	Alpine Complex		
Vegetation Class	Alpine Bogs and Fens		
Conservation status	Well conserved. Listed as a TEC on the BC Act or EPBC Act presumably as it is considered vulnerable to the impacts of climate change, the impacts of brumbies of hydroelectric schemes.		
Description	This community is common in the locality. It is poorly described by the current PCTs and associated benchmarks which don't well describe the variety of vegetation communities covered by PCT 637 and the variation in composition and structure values within excellent condition or "benchmark" occurrences of Alpine Bog, Fen and Wet Heath. Within the development site this zone includes Bog, Fen and Wet Heath.		
Characteristic canopy trees	It is characteristically treeless although occasional individuals of *Eucalyptus niphophila* may occur around rocks or other micro-habitats that improve drainage.		
Characteristic mid-storey	*Baeckea* spp.		
Characteristic groundcovers	*Empodisma minus, Richea continentis, Sphagnum* sp.*, Stylidium graminifolium, Carex gaudichaudiana, Carpha nivicola, Astelia psychrocharis, Aciphylla simplicifolia, Oreobolus distichus, Carex echinata, Cotula alpina, Ranunculus gunnianus, Ranunculus graniticola, Celmisia spp., Poa costiniana, Trisetum spicatum, Rytidosperma nivicola, Deyeuxia crassiuscula, Luzula modesta, Chionochloa frigida.*		
Mean native richness	36		
Exotic species / HTW cover	*Acetosella vulgaris*, *Agrostis capillaris*, *Festuca rubra* subsp. *rubra.*		
Condition	Moderate		
Variation and disturbance	The zone is impacted by the historic disturbance associated with the existing rope tow and other disturbances.		
No. sites sampled	1		
Threatened flora species	Perisher Wallaby Grass .		
Fauna habitats	Limited. Minor shelter and foraging resources for reptiles, amphibians and mammals such as the Broad-toothed Rat.		
Composition	**Structure**	**Function**	**Vegetation Integrity Score**
90.9	17.7	-	40.2

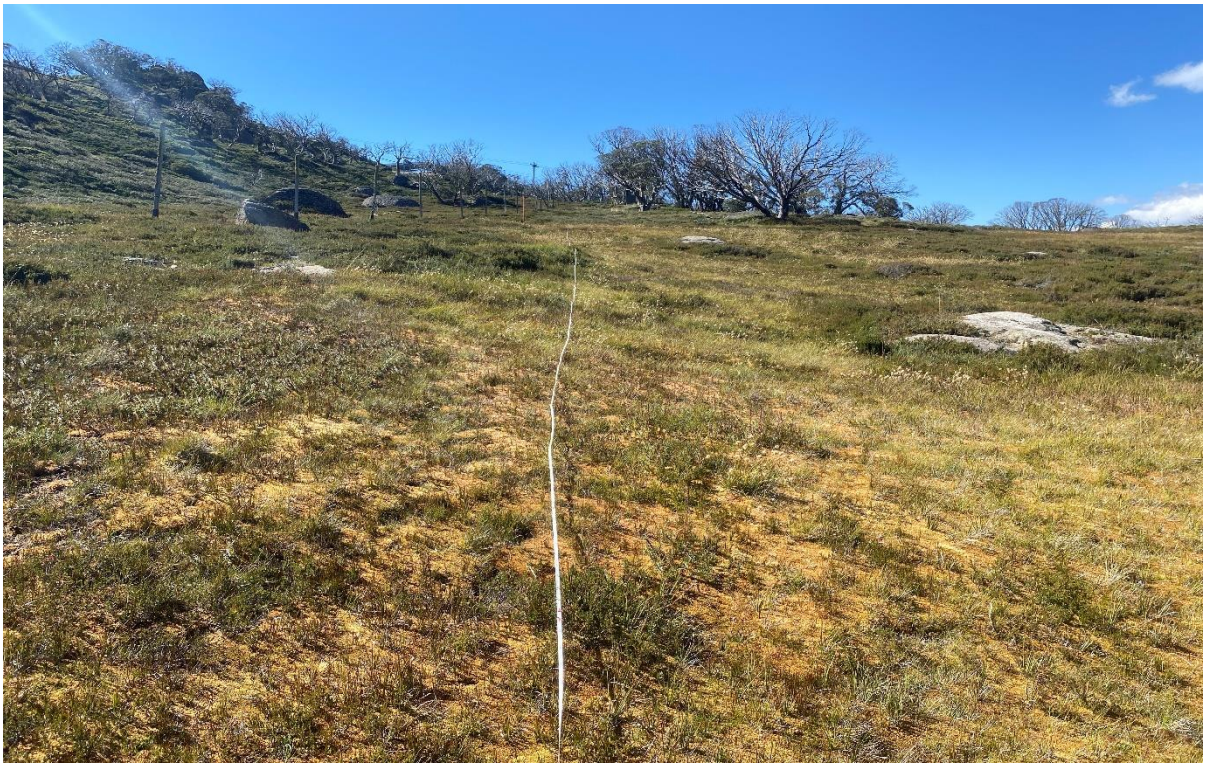

Table 9: Zone 2 PCT 645 Moderate Condition

645 - Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion			
Vegetation formation	Grassy Woodlands		
Vegetation Class	Subalpine Woodlands		
Conservation status	Widespread and well conserved. Not listed as a TEC on the BC Act or EPBC Act.		
Description	This community is common in the locality but highly variable. It is poorly described by the current PCTs and associated benchmarks which don't well describe the variety of vegetation communities covered by PCT 645 and the variation in composition and structure values within "benchmark" occurrences.		
Characteristic canopy trees	*Eucalyptus niphophila*.		
Characteristic mid-storey	*Grevillea australis, Ozothamnus cupressoides*, *Prostanthera cuneata, Nematolepis ovatifolia, Ozothamnus secundiflorus, Ozothamnus alpinus, Olearia phlogopappa, Orites lancifolius, Oxylobium ellipticum.*		
Characteristic groundcovers	*Acaena novae-zelandiae, Asperula gunnii, Carex breviculmis, Lycopodium fastigiatum, Pimelea alpina, Poa fawcettiae, Polystichum proliferum, Senecio gunnii.*		
Mean native richness	25		
Exotic species / HTW cover	*Acetosella vulgaris*		
Condition	Moderate condition		
Variation and disturbance	The community is in moderate condition within the development site and surrounds, as it has been impacted heavily in recent years by eucalypt dieback.		
No. sites sampled	1		
Threatened flora species	-		
Fauna habitats	Broad-toothed Rat, Alpine She-oak Skink and Flame Robin.		
Composition	**Structure**	**Function**	**Vegetation Integrity Score**
61.3	41.9	50.2	50.5

Table 10: Zone 3 PCT 643 Good Condition

643 - Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion			
Vegetation formation	Alpine Complex		
Vegetation Class	Alpine Heaths		
Conservation status	Widespread and well conserved. Not listed as a TEC on the BC Act or EPBC Act		
Description	This community is common in the locality but highly variable. It is poorly described by the current PCTs and associated benchmarks which don't well describe the variety of vegetation communities covered by PCT 643 and the variation in composition and structure values within "benchmark" occurrences.		
Characteristic canopy trees	It is characteristically treeless although occasional individuals of *Eucalyptus niphophila* may occur.		
Characteristic mid-storey	*Grevillea australis, Ozothamnus cupressoides*, *Prostanthera cuneata, Nematolepis ovatifolia, Ozothamnus secundiflorus, Ozothamnus alpinus, Olearia phlogopappa, Orites lancifolius, Oxylobium ellipticum, Podocarpus lawrencei.*		
Characteristic groundcovers	*Acaena novae-zelandiae, Asperula gunnii, Carex breviculmis, Lycopodium fastigiatum, Pimelea alpina, Poa fawcettiae, Polystichum proliferum, Senecio gunnii.*		
Mean native richness	29		
Exotic species / HTW cover	*Acetosella vulgaris, Agrostis capillaris, Festuca rubra subsp. rubra*		
Condition	Good condition		
Variation and disturbance	The community is in good condition within the development site.		
No. sites sampled	1		
Threatened flora species	-		
Fauna habitats	Broad-toothed Rat, Alpine She-oak Skink and Flame Robin.		
Composition	**Structure**	**Function**	**Vegetation Integrity Score**
69	61.2	-	65

Table 11: Zone 4 PCT 641 Good Condition

641 - Alpine grassland/herbfield and open heathlands in Kosciuszko National Park, Australian Alps Bioregion			
Vegetation formation	Alpine Complex		
Vegetation Class	Alpine Herbfields		
Conservation status	Widespread and well conserved. Not listed as a TEC on the BC Act or EPBC Act.		
Description	This community is common in the locality but highly variable. It is poorly described by the current PCTs and associated benchmarks which don't well describe the variety of vegetation communities covered by PCT 641 and the variation in composition and structure values within "benchmark" occurrences.		
Characteristic canopy trees	It is characteristically treeless although occasional individuals of *Eucalyptus niphophila* may occur.		
Characteristic mid-storey	*Grevillea australis, Nematolepis ovatifolia, Ozothamnus secundiflorus, Olearia phlogopappa, Oxylobium ellipticum, Melicytus dentatus.*		
Characteristic groundcovers	*Epacris gunni, Pimelea alpina, Celmisia costiniana, Craspedia spp., Euphrasia collina* subsp. *diversicolor, Microseris lanceolata, Erigeron bellidioides, Lycopodium fastigiatum, Oreomyrrhis eriopoda, Poa* spp.		
Mean native richness	-		
Exotic species / HTW cover	*Acetosella vulgaris*		
Condition	Good condition		
Variation and disturbance	The community is quite variable surrounding the development site, ranging between open heath and sod tussock grassland, but overwhelmingly in good condition.		
No. sites sampled	Not sampled as it does not occur within the development site		
Threatened flora species	-		
Fauna habitats	Broad-toothed Rat, Alpine She-oak Skink and Flame Robin.		
Composition	**Structure**	**Function**	**Vegetation Integrity Score**
-	-	NA	-

3.5.3. Assessing vegetation integrity

A vegetation integrity assessment using the BAM Calculator (BAMC) was undertaken and the results are outlined in Table 12.

Table 12: 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	637	Moderate	0.02	90.9	17.7	-	No	40.2
2	645	Moderate	0.04	61.3	41.9	50.2	Yes	50.5
3	643	Good	0.004	69	61.2	-	No	65
4	641	Good	0	NA	NA	NA	No	-

3.6. Use of local data

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

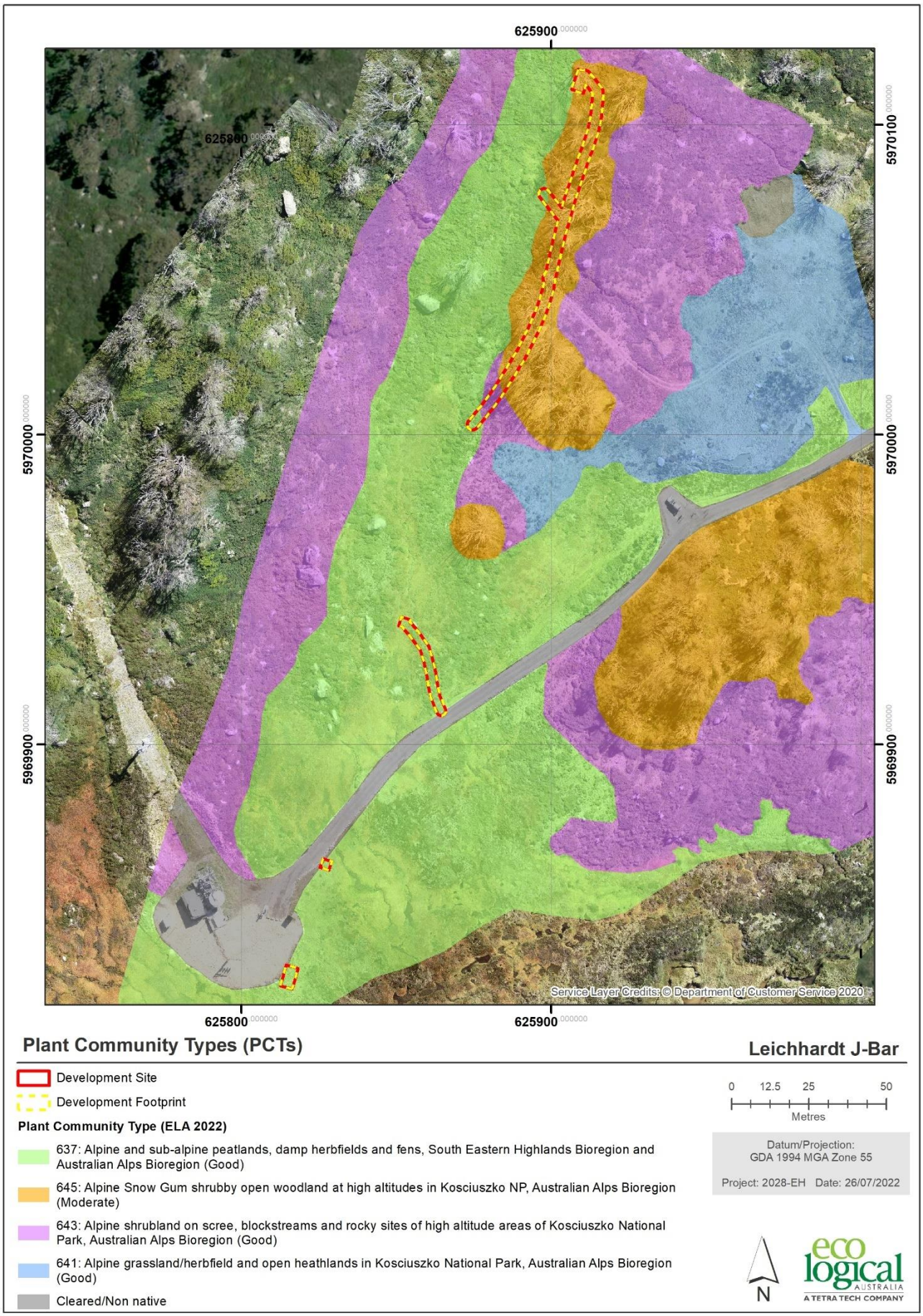

Figure 5: Plant Community Types

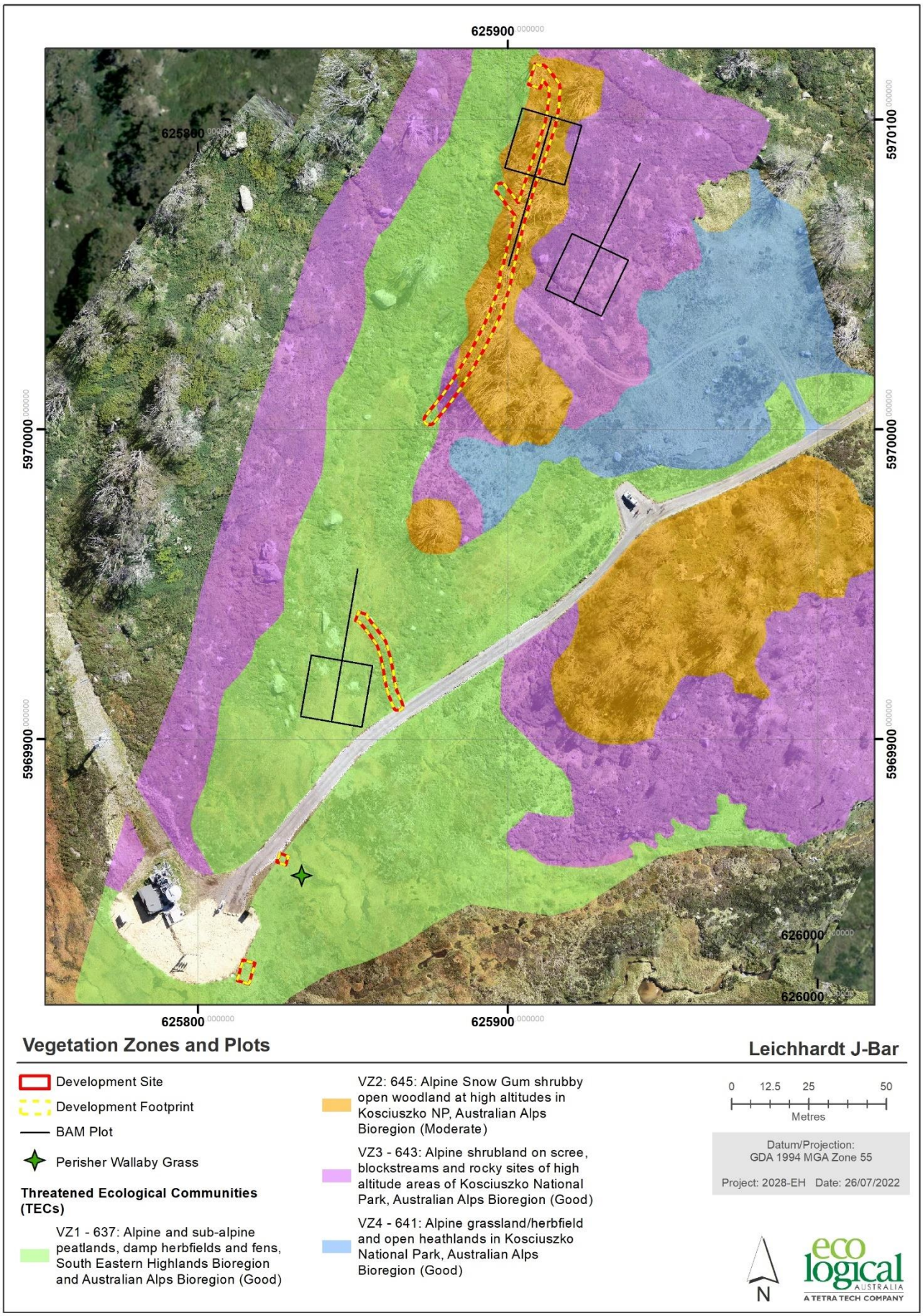

Figure 6: Vegetation Zones and Plots

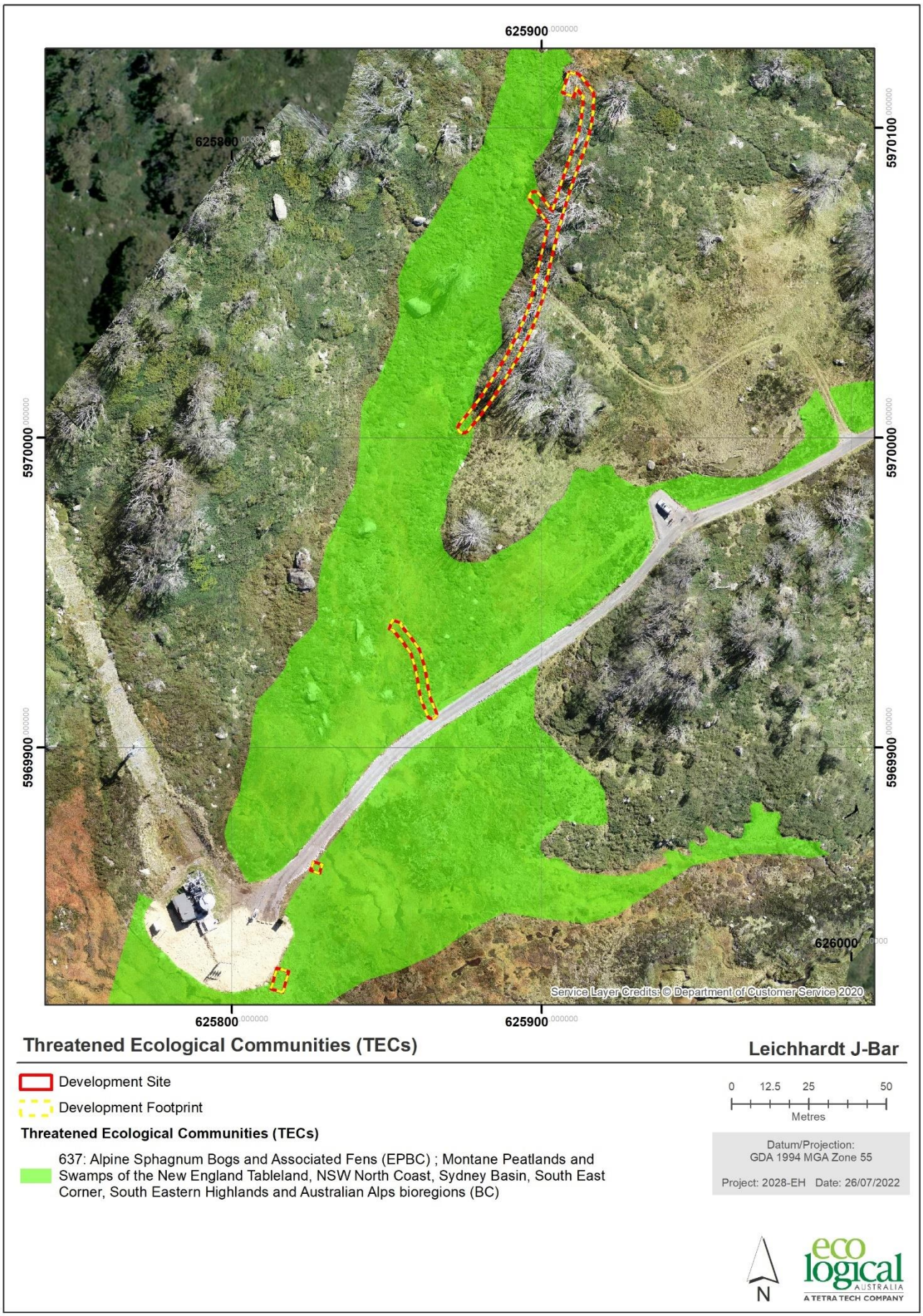

Figure 7: Threatened ecological communities

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 13.

Table 13: 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
Pachycephala olivacea	Olive Whistler	-	-	Moderate	Vulnerable	Not Listed
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 14. Four additional species credit species were added as candidate species, *Liopholis guthega* (Guthega Skink), *Mastacomys fuscus* (Broad-toothed Rat), *Cyclodomorphus praealtus* (Alpine She-oak Skink), and *Ranunculus anemoneus* (Anemone Buttercup), as they are well known from the Centre Valley area or similar habitats nearby.

4.2.2. Candidate species requiring further assessment

Six species credit species required further assessment following site survey to assess the condition of the development site and the presence of microhabitats; Guthega Skink, Broad-toothed Rat, *Euphrasia scabra* (Rough Eyebright), Perisher Wallaby-grass, Alpine She-oak Skink and Anemone Buttercup.

Table 14: Candidate species credit species

Species	Common Name	Habitat Constraints	Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status
Alpine She-oak Skink	*Cyclodomorphus praealtus*	-	-	High	Endangered	Endangered
Rough Eyebright	*Euphrasia scabra*	Other Montane bogs or within 50 m	-	High	Endangered	Not Listed
Guthega Skink	*Liopholis guthega*	Granite substrate and decomposing granite soils Rocky areas including sub-surface boulders	-	High	Endangered	Endangered
Broad-toothed Rat	*Mastacomys fuscus*	-	-	High	Vulnerable	Vulnerable
Southern Corroboree Frog	*Pseudophryne corroboree*	NA/Swamps Within 200 m of high montane and sub-alpine bog or ephemeral pool environments	above 1000 m elevation	Very High	Critically Endangered	Critically Endangered
Northern Corroboree Frog	*Pseudophryne pengilleyi*	-	above 700 m asl	Moderate	Critically Endangered	Critically Endangered
Blue-tongued Greenhood	*Pterostylis oreophila*	-	-	High	Critically Endangered	Critically Endangered
Perisher Wallaby-grass	*Rytidosperma vickeryae*	Other Small flats on the edges of creeks and rivers, on small gravel bars and in sphagnum mounds or within 20 of waterbodies Alpine bogs or within 20 m	-	High	Endangered	Not Listed
Anemone Buttercup	*Ranunculus anemoneus*	Treeless vegetation above 1000 m in altitude	Above 1400 m	High	Vulnerable	Vulnerable

4.2.3. Assessment of habitat constraints and vagrant species

Justification for the exclusion of candidate species credit species is provided in Table 15.

Table 15: 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
Rough Eyebright	*Euphrasia scabra*	Endangered	Not Listed	High	The species was not detected within the development site or immediate surrounds despite targeted surveys.
Southern Corroboree Frog	*Pseudophryne corroboree*	Critically Endangered	Critically Endangered	Very High	The Southern Corroboree Frog is limited to sphagnum bogs of the northern Snowy Mountains, in a strip from the Maragle Range in the northwest, through Mt Jagungal to Smiggin Holes in the south. Its range is entirely within Kosciuszko National Park. This species is all but extinct in the wild. It is no longer present at its former southern limit at Smiggin Holes. It is considered highly unlikely that it would occur within the development site and it was not detected there opportunistically.
Northern Corroboree Frog	*Pseudophryne pengilleyi*	Critically Endangered	Critically Endangered	Moderate	The Northern Corroboree Frog does not occur within the locality, being limited to the northern parts of the Snowy Mountains and Brindabella Range.
Blue-tongued Greenhood	*Pterostylis oreophila*	Critically Endangered	Critically Endangered	High	In NSW the Blue-tongued Greenhood is known from a few small populations within Kosciuszko National Park and a population of about 40 plants (possibly now extinct) in Bago State Forest and adjoining Crown Leases south of Tumut. It grows in wet shady sites along creeks and soaks under Mountain Tea-tree. It is considered highly unlikely that it would occur in the marginal potential habitat within the development site and has not been recorded in the locality despite extensive flora surveys over many decades.
Perisher Wallaby-grass	*Rytidosperma vickeryae*	Endangered	Not Listed	High	The species was detected within the development site during targeted surveys and the development has been designed to avoid the locations where the species occurs.

4.3. Targeted surveys

The streamlined assessment method only requires targeted surveys for candidate SAII species. The development site does not provide suitable habitat for some of the candidate species credit species that are candidate SAII species: Northern Corroboree Frog, Southern Corroboree Frog and Blue-tongued Greenhood. However, there is potential habitat for the Guthega Skink, Broad-toothed Rat, Perisher Wallaby Grass, Rough Eyebright and Anemone Buttercup, all of which, with the exception of the Rough Eyebright, are well known from the Centre Valley area.

Targeted surveys for relevant threatened species known from locality were undertaken within the development site and immediate surrounds on the dates outlined in Table 16.

Weather conditions during the targeted surveys are outlined in Table 17 and survey effort is outlined in Table 18.

Table 16: Targeted surveys

Date	Surveyors	Target species
21 March 2022	Ryan Smithers	Guthega Skink, Broad-toothed Rat, Perisher Wallaby Grass, Rough Eyebright, and Anemone Buttercup
22 March 2022	Ryan Smithers	Guthega Skink, Broad-toothed Rat, Perisher Wallaby Grass, Rough Eyebright, and Anemone Buttercup

Table 17: Weather conditions

Date	Rainfall (mm)	Minimum temperature 0^C	Maximum temperature 0^C
21 March 2022	-	10	15
22 March 2022	-	14	15

Table 18: Survey effort

Method	Habitat (ha)	Stratification units	Total effort	Target species
Target Searches	Approx. 1 ha	Suitable habitats within and immediately surrounding the development site	4 person hours	Guthega Skink and Broad-toothed Rat
Targeted threatened flora searches	Approx. 1 ha	Suitable habitats within and immediately surrounding the development site	4 person hours	Perisher Wallaby Grass, Rough Eyebright, and Anemone Buttercup

The targeted surveys resulted in the detection of two species credit species; the Broad-toothed Rat and Perisher Wallaby Grass. 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.

Perisher Wallaby Grass was detected in one location in the lower parts of the development site, as shown in Figure 6, Photo 1 and Photo 7. A total of eight plants were estimated to be present in one small patch (approximately 30 cm x 30 cm) in disturbed bog to the east of the Leichhardt Chairlift access road. The design of the proposal and the location of the development site was adjusted to ensure that the patch of Perisher Wallaby Grass will not be affected. The proposed works will be kept away from the plants by a minimum of 2.5 m by exclusion fencing.

The Guthega Skink was not detected within the development site or immediate surrounds despite two sessions (on two separate days) of targeted survey. The Guthega Skink is known from multiple records within the Centre Valley area, however it is considered unlikely that the species would occur within the development site given the generally unsuitable or marginal nature of the habitats within the development site. The development site is dominated by wet habitats or grasslands, which do not provide preferred habitat for the Guthega Skink. Better quality habitat for the Guthega Skink occurs immediately upslope of the development site, as shown in Photo 8.

The Alpine She-oak Skink has been assumed to be present within the drier parts of the development site given its cryptic nature and the presence of suitable habitat.

Following completion of field surveys, the species credit species included in the assessment are outlined in Table 19.

Table 19: Species credit species included in the assessment

Species	Common Name	Species presence	Geographic limitations	Habitat (ha) / count	Biodiversity Risk Weighting
Alpine She-oak Skink	*Cyclodomorphus praealtus*	Assumed	-	0.04 ha	2
Broad-toothed Rat	*Mastacomys fuscus*	Yes	-	0.06 ha	2

4.3.1. Species credit species included in the assessment

Two species credit species, the Alpine She-oak Skink and Broad-toothed Rat, have been included in the assessment as the proposed development will impact on known or potential habitat for these species. A species polygon for the Alpine She-oak Skink and Broad-toothed Rat is included as Figure 8. The location of the Perisher Wallaby Grass immediately adjacent to the development site, is also shown in Figure 8.

4.4. Identification of prescribed additional biodiversity impact entities

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

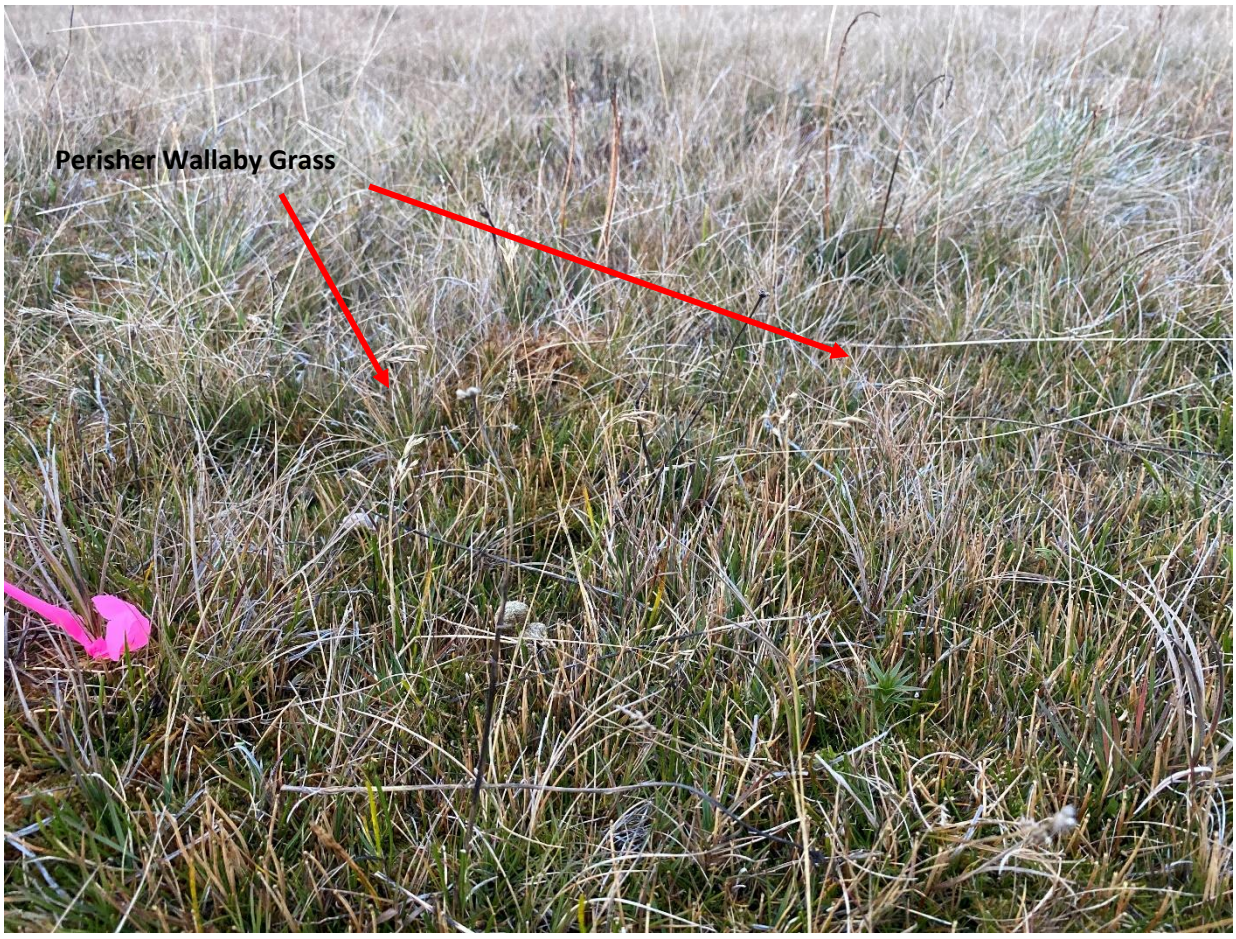

Photo 7: Eight Perisher Wallaby Grass plants were detected just to the east of the proposed Tower 1.

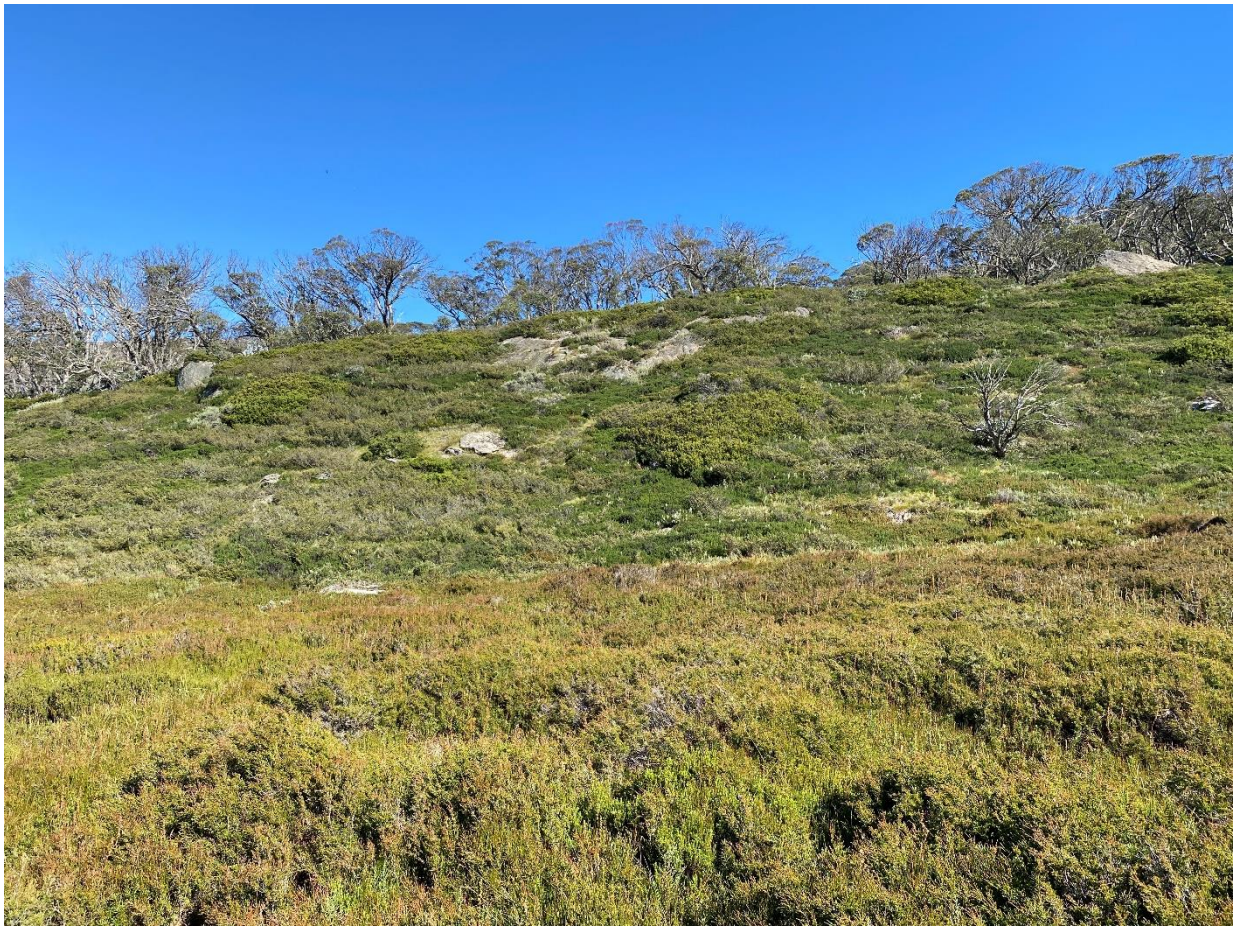

Photo 8: The dry shrubby habitats with embedded rock on the slopes immediately to the west of the development site provide superior habitat for the Guthega Skink.

Figure 8: Species polygons

5. Avoiding and Minimising Impacts on Biodiversity Values

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

5.1.1. Direct and indirect impacts

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

- Locating the proposed works in disturbed areas where possible.
- Minimising the disturbance footprint associated with construction by utilising a small excavator.
- Minimising the disturbance footprint associated with construction by utilising under-boring where the safety line and electricity cabling traverses bog.
- Minimising the disturbance footprint associated with construction by co-locating the safety line and electricity cabling with construction access.
- Moving the Top Station approximately 10 m to the south, so that the access to each tower is shortened and located closer to the drier, less sensitive vegetation.
- Changing the location of the alignment to avoid known locations of Perisher Wallaby Grass and to minimise impacts on endangered ecological communities.
- Planning construction access and egress to avoid and minimise impacts on vegetation and fauna habitats.
- Marking the extent of the development site prior to the commencement of works, such that the disturbance footprint will not extend beyond the proposed footprint.
- Fencing off the location of the Perisher Wallaby Grass prior to the commencement of works and buffering them from the proposed works by a minimum of 2.5 m to ensure they are not impacted.
- Using low impact construction methods such as sod replacement and over-snow rock removal where rocks cannot be accessed from the existing or proposed access roads/tracks.
- Undertaking post construction rehabilitation.

5.1.2. Prescribed biodiversity impacts

The proposal involves the following prescribed biodiversity impacts:

- The removal or reduction of a small amount of rock outcropping.
- The removal of some dead tree trunks and limbs.

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 20.
- Threatened species and threatened species habitat is outlined in Table 21.
- Prescribed biodiversity impacts is outlined in Section 6.4.

Note, consistent with the streamlined assessment method, the impacts on native vegetation, with the exception of TECs, have been grouped into the dominant PCT within the development site, PCT 645.

Table 20: Direct impacts to native vegetation

PCT ID	PCT Name	BC Act listing	EPBC Act listing	Direct impact (ha)
637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Endangered	Endangered	0.02
645	Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion	Not listed	Not Listed	0.04

Table 21: 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
Cyclodomorphus praealtus	Alpine She-oak Skink	0.04 ha	Endangered	Endangered
Mastacomys fuscus	Broad-toothed Rat	0.06 ha	Vulnerable	Vulnerable

6.2. Change in vegetation integrity

The change in vegetation integrity as a result of the development is outlined in Table 22.

Table 22: Change in vegetation integrity

Veg Zone	PCT ID	Condition	Area (ha)	Current vegetation integrity score	Future vegetation integrity score	Change in vegetation integrity
1	637	Good	0.02	40.2	0	-40.2
2	645	Moderate	0.04	50.5	0	-50.5

6.3. Indirect impacts

The indirect impacts of the development are outlined in Table 23. Given the nature of the proposed development, and the proposed mitigation measures, indirect impacts are only anticipated to extend a maximum of 2 m into vegetation surrounding the proposed development site. Indirect impact zones are shown on Figure 9.

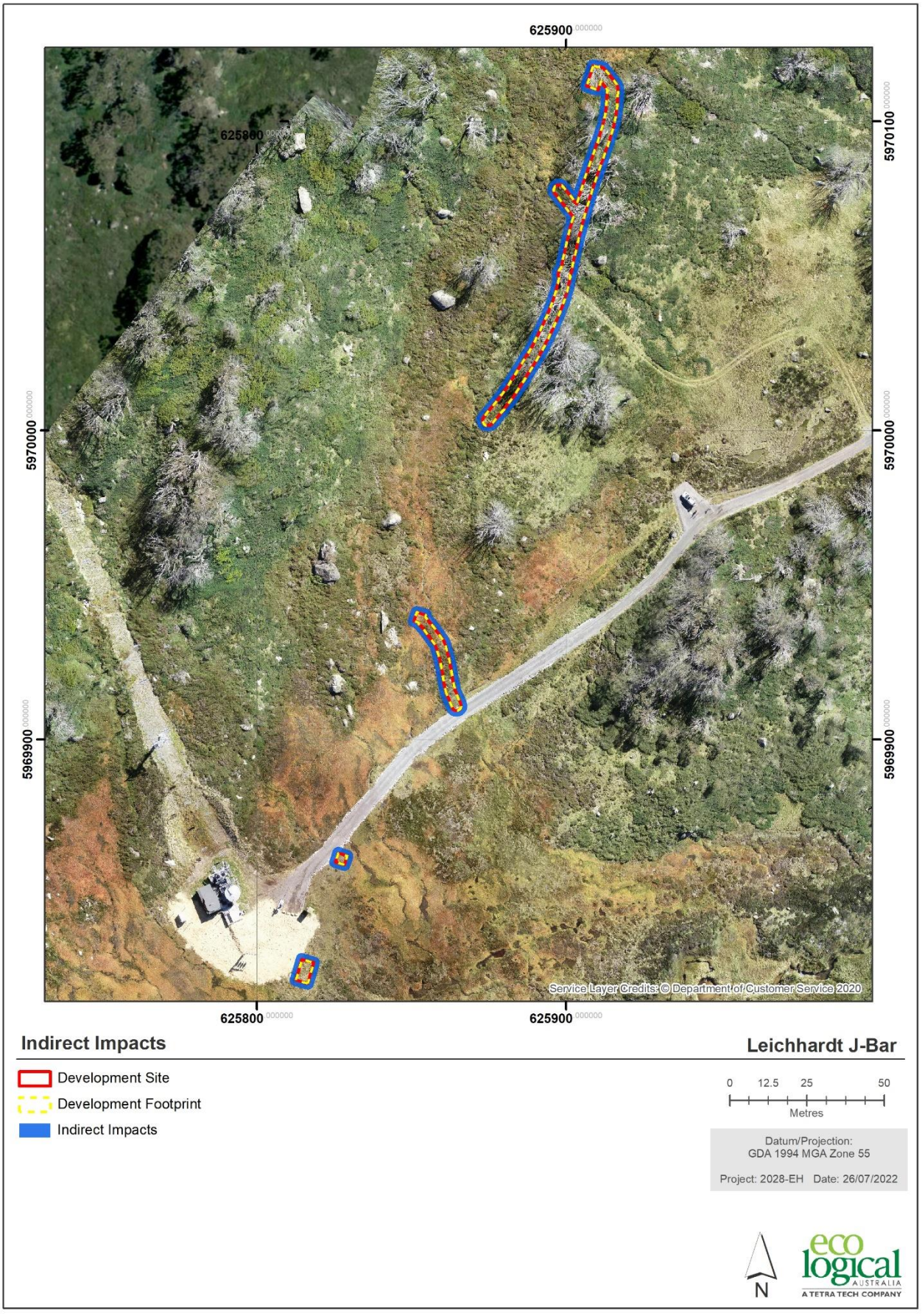

Figure 9: Indirect impact zones

Table 23: 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. There is potential for indirect impacts in association with the proposed rock removal, under-boring, lift tower excavation, increased skier usage and grooming. However, The construction methods used at Perisher have been effective at preventing impacts on adjacent vegetation during the many other similar developments that have been undertaken in recent years. Furthermore the study area is regularly skied and has had grooming machinery working over it everyday in winter since the rope tow was installed 40 years ago. Under these circumstance, inadvertent impacts on habitat and vegetation are expected to be minor.	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 Perisher Resort area and elsewhere within the NSW Alps. The proposal will include post construction rehabilitation and weed control.	Not expected	Not expected but possible	Not expected	Not expected
Vehicle strike	Construction	Minor. It is considered unlikely that the proposal will include vehicle strike impacts. Vehicles will be travelling at very slow speeds within the development site and the noise and vibration associated with vehicle movements is expected to deter any fauna within or adjoining the development site from the path of any vehicles.	Not expected	Not expected but possible	During construction	Not expected
Trampling of threatened flora species	Construction	Minor. It is considered unlikely that any threatened flora species adjacent to the development site will be affected. Measures have been incorporated to avoid and protect known threatened flora occurrences adjacent to the development site.	Minor	Not expected	During construction	Not expected

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
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
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 are known to be present.	Not expected	Not expected	Not expected	Not expected

6.4. Prescribed biodiversity impacts

The proposal involves the following prescribed biodiversity impacts:

- The removal or reduction of a small amount of rock outcropping.
- The removal of some dead tree trunks and limbs.

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 24.

6.6. Mitigating prescribed impacts

The development will involve very minor prescribed biodiversity impacts associated with the removal of a small amount of outcropping rock and subsurface rock associated with the proposed excavation and the removal of some dead tree trunks and limbs.

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 24: Measures proposed to mitigate and manage impacts

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Displacement of resident fauna	Low	Low	None proposed.	NA	NA	NA
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	Medium	Low	The location of the Perisher Wallaby Grass patch is to be fenced off prior to construction. The Perisher Wallaby Grass patch is to be buffered from the proposed works by a minimum of 2.5 m. The proposed excavations are to be undertaken using the sod replacement technique, except for a wheeled vehicle track that will be retained between Tower 3 and Top Station. Any trenches that are left open overnight are to have planks of wood or the like placed in them to enable fauna to exit the trench. Open trenches are to be inspected in the morning for fauna and any fauna that are trapped are to be released into adjacent areas.	The Perisher Wallaby Grass location is fenced off and buffered from the proposed works. Vegetation impacts mitigated by use of the sod replacement technique. Impacts on fauna mitigated.	Prior to construction	Perisher
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 paint and/or flagging tape the alignment of the proposed works prior to construction. Fence off the Perisher Wallaby Grass location as “no go” area.	Risk of disturbance beyond proposed disturbance footprint is reduced.	Prior to construction	Perisher
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	Perisher

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
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	Perisher
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	Perisher
Adaptive dust monitoring programs to control air quality	Low	Low	None proposed.	NA	NA	NA
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 location of the Perisher Wallaby Grass is to be fenced off prior to construction and identified as a “no go” area. The Perisher Wallaby Grass patch is buffered from the proposed works by a minimum of 2.5 m.	The Perisher Wallaby Grass location is fenced off and buffered from the proposed works.	Prior to and during construction	Perisher
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 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	Perisher
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, particularly the buffer to the Perisher Wallaby Grass patch.	Risk of disturbance beyond proposed disturbance corridor is reduced.	Prior to and during construction as necessary	Perisher

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
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 Perisher rehabilitation strategies.	Post construction vegetation within the development footprint with high medium-term recovery potential.	Immediately post construction	Perisher
Monitoring	Medium	Low	A monitoring plan, comprising rapid qualitative monitoring actions such as photo monitoring points, and annual inspections for weeds, adverse impacts on vegetation, and the known Perisher Wallaby Grass location, should be prepared and implemented. The monitoring plan should inform an adaptive management approach to the mitigation of any adverse impacts that may arise.	Risk of adverse impacts substantially reduced.	Post construction	Perisher

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 25 and shown on Figure 10. The impacts of the development requiring offset for species credit species and their habitats are outlined in Table 26 and on Figure 10.

Table 25: Impacts to native vegetation that require offsets

Vegetation Zone	PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
1	637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Alpine Bogs and Fens	Alpine Complex	0.02
2	645	Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion	Alpine Heaths	Alpine Complex	0.04

Table 26: 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
Cyclodomorphus praealtus	Alpine She-oak Skink	0.04 ha	Endangered	Endangered
Mastacomys fuscus	Broad-toothed Rat	0.06 ha	Vulnerable	Vulnerable

7.3. Impacts not requiring offsets

All the impacts of the development on native vegetation and on the Alpine She-oak Skink and Broad-toothed Rat require offsets. The impacts of the proposed development on non-native vegetation do not require offsets.

7.4. Areas not requiring assessment

No parts of the proposed development do not require assessment.

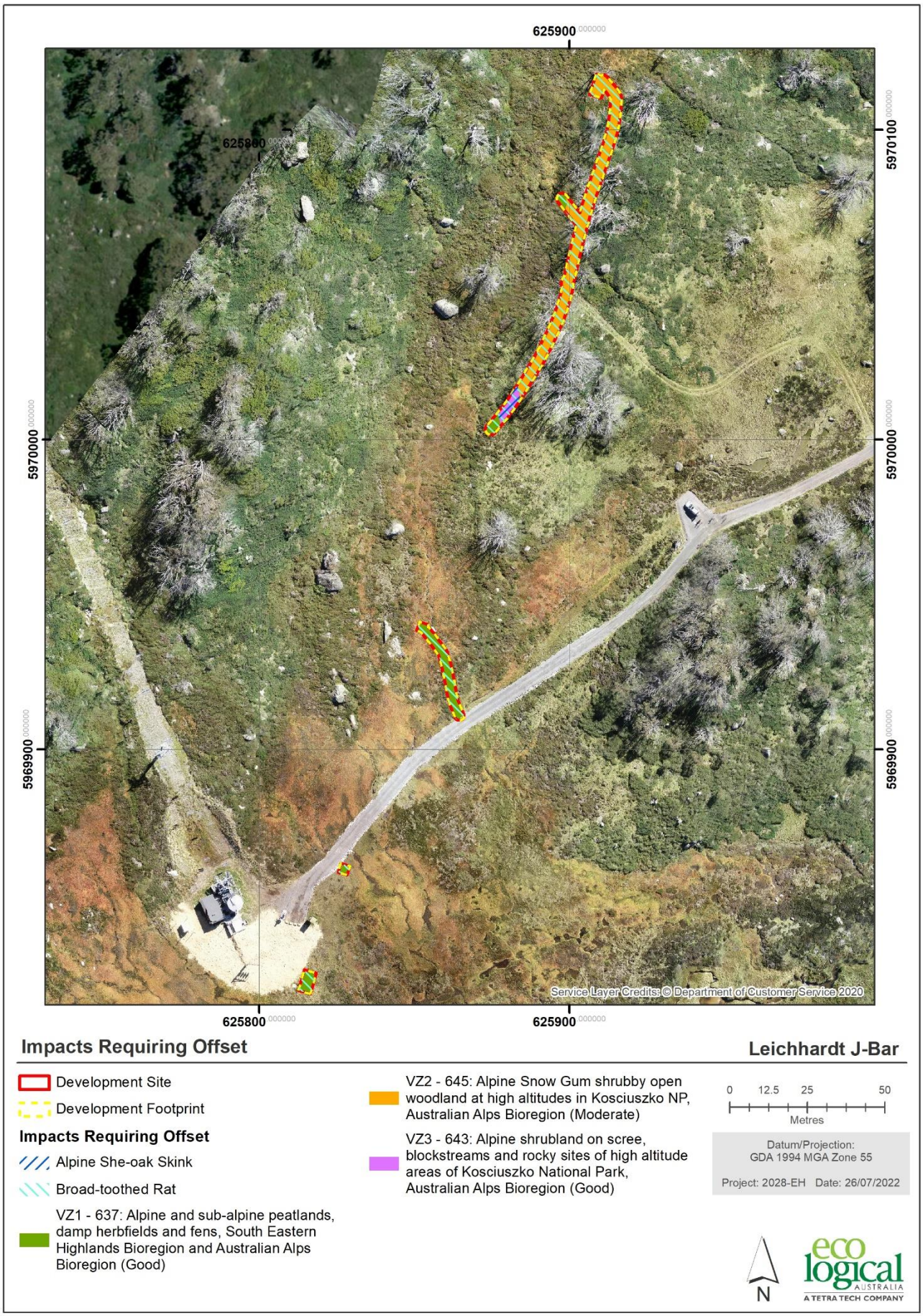

Figure 10: Impacts requiring offset

7.5. Credit summary

The number of ecosystem credits required for the development are outlined in Table 27.

The number of species credits required for the development are outlined in Table 28.

A biodiversity credit report is included in Appendix F.

Table 27: Ecosystem credits required

Vegetation Zone	PCT ID	PCT Name	Condition	Credit Class	Direct impact (ha)	Credits required
1	637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Moderate	Alpine Bogs and Fens	0.02	1
2	645	Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion	Moderate	Alpine Heaths	0.04	1

Table 28: Species credit summary

Species	Common Name	Direct impact number of individuals / habitat (ha)	Credits required
Cyclodomorphus praealtus	Alpine She-oak Skink	0.04 ha	1
Mastacomys fuscus	Broad-toothed Rat	0.06 ha	2

8. Consistency with legislation and policy

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

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

- Alpine She-oak Skink
- Guthega Skink
- Broad-toothed Rat
- Alpine Sphagnum Bogs and Associated Fens.

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

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

9. Recommendations

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

- The mitigation measures identified in Table 24 should be incorporated into the proposal.

10. Conclusion

Eco Logical Australia Pty Ltd was engaged by Perisher Blue Pty Ltd to prepare a BDAR for the proposed replacement of the existing Home Rope Tow lift with a new J-bar lift and associated works in the Centre Valley area of Perisher Ski 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 two ecosystem credits and three species credits are required to offset the unavoidable impacts to the vegetation and fauna habitats present within the development footprint.

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

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

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Appendix A - Definitions

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

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

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

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

Appendix B - Vegetation Floristic Plot Data

Table 29: Species recorded in the plots and incidentally elsewhere within the development site or immediate surrounds.

Family	Species	Common Name	Listing Status	Exotic	High Threat Weed	Growth Form Group	Plot 1			Plot 2			Plot 3		
							Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance
Rosaceae	*Acaena* sp.	Sheep's Burr	-			Forb (FG)	g	0.1	1	g	0.1	1	g	0.2	5
Polygonaceae	*Acetosella vulgaris*	Sheep Sorrel	-	Yes	Yes		g	0.1	1	g	0.1	5	g	0.1	100
Asteraceae	*Achillea millefolium*	Yarrow	-	Yes	Yes		0	0	0	0	0	0	g	0.1	10
Apiaceae	*Aciphylla simplicifolia*	Mountain Aciphyll	-			Forb (FG)	g	0.1	10	g	0.1	2	0	0	0
Poaceae	*Agrostis capillaris*	Browntop Bent	-	Yes	Yes		g	0.1	5	0	0	0	0	0	0
Rubiaceae	*Asperula gunnii*	Mountain Woodruff	-			Forb (FG)	g	0.1	1	g	0.1	20	g	0.1	20
Asteliaceae	*Astelia psychrocharis*	-	-			Forb (FG)	g	0.2	10	0	0	0	0	0	0
Myrtaceae	*Baeckea gunniana*	Alpine Baeckea	-			Shrub (SG)	g	15	500	0	0	0	0	0	0
Cyperaceae	*Carex breviculmis*	-	-			Grass & grasslike (GG)	g	0.1	1	g	0.1	10	g	3	500
Cyperaceae	*Carex echinata*	Star Sedge	-			Grass & grasslike (GG)	g	5	1000	0	0	0	0	0	0
Cyperaceae	*Carex gaudichaudiana*	-	-			Grass & grasslike (GG)	g	10	1000	0	0	0	g	0.2	100
Cyperaceae	*Carpha nivicola*	-	-			Grass & grasslike (GG)	g	2	100	0	0	0	0	0	0
Asteraceae	*Celmisia costiniana*	-	-			Forb (FG)	g	0.2	50	g	0.2	50	0	0	0
Asteraceae	*Coronidium scorpioides*	Button Everlasting	-			Forb (FG)	0	0	0	g	0.1	2	0	0	0
Asteraceae	*Craspedia jamesii*	-	-			Forb (FG)	0	0	0	0	0	0	g	0.3	100
Asteraceae	*Craspedia* sp.	Billy Buttons	-			Forb (FG)	g	0.1	5	0	0	0	0	0	0
Poaceae	*Deyeuxia crassiuscula*	-	-			Grass & grasslike (GG)	g	0.1	5	0	0	0	0	0	0

Family	Species	Common Name	Listing Status	Exotic	High Threat Weed	Growth Form Group	Plot 1			Plot 2			Plot 3		
							Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance
Restionaceae	*Empodisma minus*	-	-			Grass & grasslike (GG)	g	15	1000	g	2	100	g	0.1	20
Ericaceae	*Epacris glacialis*	-	-			Shrub (SG)	g	0.5	50	0	0	0	0	0	0
Ericaceae	*Epacris microphylla*	Coral Heath	-			Shrub (SG)	g	0.1	1	0	0	0	0	0	0
Ericaceae	*Epacris paludosa*	Swamp Heath	-			Shrub (SG)	g	15	500	0	0	0	m	0.1	1
Ericaceae	*Epacris petrophila*	Snow Heath	-			Shrub (SG)	g	2	100	0	0	0	0	0	0
Onagraceae	*Epilobium gunnianum*	Gunn's Willow-herb	-			Forb (FG)	g	0.1	20	0	0	0	m	0.3	20
Asteraceae	*Erigeron bellidioides*	-	-			Forb (FG)	0	0	0	0	0	0	0	0	0
Myrtaceae	*Eucalyptus niphophila*	-	-			Tree (TG)	0	0	0	u	8	10	u	0.3	7
Orobanchaceae	*Euphrasia collina* subsp. *diversicolor*	-	-			Forb (FG)	0	0	0	0	0	0	g	0.3	50
Orobanchaceae	*Euphrasia collina* subsp. *glacialis*	-	-			Forb (FG)	g	0.3	50	0	0	0	0	0	0
Poaceae	*Festuca rubra* subsp. rubra	Red Fescue	-	Yes			g	0.1	5	0	0	0	0	0	0
Geraniaceae	*Geranium potentilloides* var. *potentilloides*	-	-			Forb (FG)	0	0	0	0	0	0	0	0	0
Haloragaceae	*Gonocarpus micranthus* subsp. *micranthus*	-	-			Forb (FG)	g	0.1	5	0	0	0	0	0	0
Proteaceae	*Grevillea australis*	Alpine Grevillea	-			Shrub (SG)	0	0	0	0	0	0	u	4	50
Fabaceae (Faboideae)	*Hovea montana*	-	-			Shrub (SG)	0	0	0	g	5	100	g	5	100
Asteraceae	*Hypochaeris radicata*	Catsear	-	Yes			0	0	0	0	0	0	g	0.1	10
Cyperaceae	*Isolepis aucklandica*	-	-			Grass & grasslike (GG)	g	0.3	500	0	0	0	0	0	0

Family	Species	Common Name	Listing Status	Exotic	High Threat Weed	Growth Form Group	Plot 1			Plot 2			Plot 3		
							Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance
Juncaceae	*Juncus falcatus*	-	-			Grass & grasslike (GG)	g	0.3	500	0	0	0	0	0	0
Poaceae	*Lachnagrostis meionectes*	-	-			Grass & grasslike (GG)	0	0	0	0	0	0	0	0	0
Juncaceae	*Luzula modesta*	-	-			Grass & grasslike (GG)	g	0.2	100	0	0	0	0	0	0
Juncaceae	*Luzula novae-cambriae*	-	-			Grass & grasslike (GG)	0	0	0	g	0.1	10	g	0.1	20
Lycopodiaceae	*Lycopodium fastigiatum*	Mountain Clubmoss	-			Fern (EG)	g	0.2	50	g	0.1	10	g	0.3	50
Rutaceae	*Nematolepis ovatifolia*	-	-			Shrub (SG)	0	0	0	m	0.1	1	u	8	50
Asteraceae	*Olearia spp.*	-	-			Shrub (SG)	0	0	0	m	5	100	u	3	100
Cyperaceae	*Oreobolus distichus*	-	-			Grass & grasslike (GG)	g	1	500	0	0	0	0	0	0
Apiaceae	*Oreomyrrhis ciliata*	Bog Carraway	-			Forb (FG)	g	0.2	100	0	0	0	0	0	0
Apiaceae	*Oreomyrrhis eriopoda*	Australian Carraway	-			Forb (FG)	0	0	0	0	0	0	g	0.2	50
Proteaceae	*Orites lancifolius*	Alpine Orites	-			Shrub (SG)	0	0	0	0	0	0	u	2	5
Apiaceae	*Oschatzia cuneifolia*	Wedge Oschatzia	-			Forb (FG)	g	0.1	50	0	0	0	0	0	0
Fabaceae (Faboideae)	*Oxylobium ellipticum*	Common Shaggy Pea	-			Shrub (SG)	0	0	0	m	5	100	0	0	0
Asteraceae	*Ozothamnus alpinus*	Alpine Everlasting	-			Shrub (SG)	0	0	0	m	2	20	0	0	0
Asteraceae	*Ozothamnus cupressoides*	-	-			Shrub (SG)	g	0.3	20	g	0.1	5	u	1	20
Asteraceae	*Ozothamnus secundiflorus*	Cascade Everlasting	-			Shrub (SG)	g	0.1	1	m	0.5	2	0	0	0
Thymelaeaceae	*Pimelea alpina*	-	-			Shrub (SG)	0	0	0	g	0.1	5	g	0.5	50
Thymelaeaceae	*Pimelea ligustrina* subsp. *ciliata*	-	-			Shrub (SG)	0	0	0	m	1	50	u	3	20

Family	Species	Common Name	Listing Status	Exotic	High Threat Weed	Growth Form Group	Plot 1			Plot 2			Plot 3		
							Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance
Poaceae	*Poa costiniana*	Bog Snowgrass	-			Grass & grasslike (GG)	g	0.5	100	0	0	0	0	0	0
Poaceae	*Poa ensiformis*	Purple-sheathed Tussock-grass	-			Grass & grasslike (GG)	0	0	0	g	2	500	0	0	0
Poaceae	*Poa fawcettiae*	Smooth Blue Snowgrass	-			Grass & grasslike (GG)	0	0	0	g	8	2000	g	45	2000
Asteraceae	*Podolepis robusta*	Mountain Lettuce	-			Forb (FG)	0	0	0	0	0	0	0	0	0
Dryopteridaceae	*Polystichum proliferum*	Mother Shield Fern	-			Fern (EG)	0	0	0	0	0	0	0	0	0
Orchidaceae	*Prasophyllum alpestre*	-	-			Forb (FG)	0	0	0	0	0	0	0	0	0
Lamiaceae	*Prostanthera cuneata*	Alpine Mint-bush	-			Shrub (SG)	0	0	0	m	60	500	u	20	100
Ranunculaceae	*Ranunculus dissectifolius*	-	-			Forb (FG)	g	0.1	2	0	0	0	0	0	0
Ranunculaceae	*Ranunculus graniticola*	Granite Buttercup	-			Forb (FG)	0	0	0	0	0	0	g	0.2	20
Ericaceae	*Richea continentis*	Candle Heath	-			Shrub (SG)	g	5	100	g	0.1	1	g	0.2	2
Poaceae	*Rytidosperma nivicola*	-	-			Grass & grasslike (GG)	g	0.1	10	0	0	0	0	0	0
Poaceae	*Rytidosperma nudiflorum*	-	-			Grass & grasslike (GG)	g	0.1	10	0	0	0	0	0	0
Caryophyllaceae	*Scleranthus biflorus*	Two-flowered Knawel	-			Forb (FG)	g	0.1	1	0	0	0	0	0	0
Asteraceae	*Senecio gunnii*	-	-			Forb (FG)	0	0	0	0	0	0	g	0.3	50
Asteraceae	*Senecio pinnatifolius* var. *alpinus*	-	-			Forb (FG)	0	0	0	0	0	0	g	0.1	5
Sphagnaceae	*Sphagnum* sp.	-	-				g	55	1000	0	0	0	0	0	0
Stylidiaceae	*Stylidium graminifolium*	Grass Triggerplant	-			Forb (FG)	g	1	500	g	0.1	3	0	0	0

Family	Species	Common Name	Listing Status	Exotic	High Threat Weed	Growth Form Group	Plot 1			Plot 2			Plot 3		
							Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance
Winteraceae	*Tasmannia xerophila* subsp. *xerophila*	Alpine Pepperbush	-			Shrub (SG)	0	0	0	m	0.2	2	0	0	0
Poaceae	*Trisetum spicatum*	Bristle Grass	-			Grass & grasslike (GG)	0	0	0	0	0	0	g	0.1	20
Violaceae	*Viola betonicifolia*	Native Violet	-			Forb (FG)	0	0	0	0	0	0	g	0.1	10

Appendix C - Vegetation Integrity Plot Data

Table 30: Plot location data

Plot no.	PCT	Condition	Easting	Northing	Bearing
1	637	Good	625844	5969909	0
2	645	Moderate	625917	5970036	172
3	643	Good	625932	5970019	0

Table 31: Vegetation integrity data (composition)

Composition (number of species)						
Plot	Tree	Shrub	Grass	Forb	Fern	Other
1	0	8	13	14	1	0
2	1	12	5	6	1	0
3	1	11	6	10	1	0

Table 32: Vegetation integrity data (Structure)

Structure (Total cover)						
Plot	Tree	Shrub	Grass	Forb	Fern	Other
1	0	38	34.7	2.8	0.2	0
2	8	79.1	12.2	0.7	0.1	0
3	0.3	46.8	48.5	2.1	0.3	0

Table 33: 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	1.6	0	0	0	0	0	0	0	0.2
2	0	1	15	58	1	1	1	1	0	1	0.1
3	0	0	18	0	0	0	0	0	0	1	0.2

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 entities which are known or considered to have the potential to occur within the study area are the:

- Alpine She-oak Skink
- Guthega Skink
- Broad-toothed Rat
- Alpine Sphagnum Bogs and Associated Fens.

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

Matters to be considered	Impact
Any environmental impact on a World Heritage Property or National Heritage Places	No. The proposed action does not impact on a World Heritage Property or a National Heritage Place - (listed natural: Australian Alpine National Parks and Reserves; nominated historic: Snowy Mountains Scheme NSW).
Any environmental impact on Wetlands of International Importance	No. The proposal will not affect any part of a wetland of international importance.
Any impact on Commonwealth Listed Critically Endangered or Endangered Species;	Yes. The development site does provide potential habitat for the following Commonwealth listed endangered entities; Alpine She-oak Skink and Guthega Skink The significant impact criteria for endangered species are discussed below: a. lead to a long-term decrease in the size a population of a species, The Guthega Skink has not been detected within the development site or immediate surrounds and the proposed works will be at least 50 m from the nearest known Guthega Skink burrow, which occurs to the west of the development site. The proposed action will only affect a small amount of marginal potential habitat for the species in the context of the extent of potential habitat within the Centre Valley area. The targeted surveys undertaken for this assessment suggest that the species does not utilise the potential habitat within the development site. The impacts associated with the proposed action will not result in the removal of any of the dense groundcovers the Alpine She-oak Skink is associated with. As such, the habitats within

Matters to be considered	Impact
	the study area will continue to available to the species after the completion of the proposed action. It is considered highly unlikely that the proposed works would result in injury or death of any Alpine She-oak Skink individuals as the disturbances associated with the proposed works are likely to temporarily deter any individuals from the locations where works are being undertaken. Under these circumstances, it is considered highly unlikely that the proposed action will lead to a long-term decrease in the size of the Guthega Skink or Alpine She-oak Skink populations. b. reduce the area of occupancy of the species The proposed action will be limited to the disturbance of less than 0.1 ha of native vegetation which is a small amount of habitat in the context of the extent of similar habitats in the Centre Valley area and in the locality generally. The proposed works will not affect any key habitat resources for the Alpine She-oak Skink or Guthega Skink; nor affect their ability to access habitats within or beyond the development site. Under these circumstances, the proposed action is highly unlikely to reduce the area of occupancy of the local populations of the Alpine She-oak Skink or Guthega Skink. c. fragment an existing population into two or more populations The proposed action will be limited to the disturbance of less than 0.1 ha of native vegetation which is a small amount of habitat in the context of the extent of similar habitats in the Centre Valley area and in the locality generally. The proposed works will not affect any key habitat resources for the Alpine She-oak Skink or Guthega Skink; nor affect their ability to access habitats within or beyond the development site. Under these circumstances, the proposed action will not fragment an existing population of the Alpine She-oak Skink or Guthega Skink into two or more populations. d. adversely affect habitat critical to the survival of a species No habitat within the development site is considered likely to be critical to the survival of the Alpine She-oak Skink or Guthega Skink. There are thousands of hectares of similar habitats in the alpine and subalpine zones of the Australian alps, including elsewhere within the Perisher Resort area. Alpine She-oak Skink and Guthega Skink continue to occur within the Perisher Resort Area despite a long history of similar and more extensive disturbances. e. disrupt the breeding cycle of a population It is possible although unlikely that the Alpine She-oak Skink may breed within the development site. However, any local population of these species is highly unlikely to be limited to the development site, which represents only a very small proportion of the potential habitat available to the species in the locality and so breeding can proceed as normal in the other available areas. It is considered highly unlikely that the Guthega Skink would breed within the development site given the absence of burrows and the generally marginal nature of the potential habitat for the species there. Under these circumstances, it is highly unlikely that the proposed action would disrupt the breeding cycle of a population of the Alpine She-oak Skink or Guthega Skink. f. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline The proposed action will modify a very small area of marginal potential habitat for the Alpine She-oak Skink and Guthega Skink, but this area is unlikely to be important to the species in the context of the extent of potential habitat in the locality.

Matters to be considered	Impact
	Under these circumstances it is highly unlikely that the proposed action would modify- destroy-remove or isolate or decrease the availability or quality of habitat to the extent that the Alpine She-oak Skink or Guthega Skink is likely to decline. g. result in invasive species that are harmful to an endangered species becoming established in the endangered or critically endangered species' habitat The proposed action is unlikely to result in invasive species that are harmful becoming established in potential habitat of the Alpine She-oak Skink or Guthega Skink. Species such as cats or foxes are already present in the landscape and are subject to control programs within the resort. h. introduce disease that may cause the species to decline The proposed action is unlikely to introduce disease that may cause the Alpine She-oak Skink or Guthega Skink to decline. i. interfere substantially with the recovery of the species. As the proposed action is not considered to decrease or fragment any existing populations the recovery of the Alpine She-oak Skink and Guthega Skink is unlikely to be adversely impacted.
Any impact on Commonwealth Listed Vulnerable Species;	Yes. The study area provides known habitat for one Commonwealth listed vulnerable species: the Broad-toothed Rat. The significant impact criteria in terms of the vulnerable species are discussed below: a. lead to a long-term decrease in the size of an important population of a species. Whilst the proposed action will affect some known Broad-toothed Rat habitat, it will affect only a very small amount (less than 0.1 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. Under these circumstances the proposed action will not lead to a long-term decrease in the size of an important population of the Broad-toothed Rat. b. reduce the area of occupancy of an important population It is highly likely that the Broad-toothed Rat will continue to occur within the development site after the implementation of the proposed action. The species continues to be locally common in the Perisher 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 specie' population extends beyond the development site and the Perisher 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

Matters to be considered	Impact
	The proposed action and affected area is too small to disrupt the breeding cycle of a population of the Broad-toothed Rat. f. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline The proposed action will not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the Broad-toothed Rat is likely to decline as the habitat to be affected is very small in the context of the available habitat within the Perisher 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 scat throughout the Thredbo Resort Area, including within the village, and in areas that have been subject to the sorts of activities proposed. As such, it is considered highly unlikely that proposed action will substantially interfere with the recovery of the Broad-toothed Rat.
Any impact on a Commonwealth Endangered Ecological Community	Yes: The Alpine Sphagnum Bogs and Associated Fens endangered ecological community occurs within the development site. The significant impact criteria in terms of endangered ecological communities are discussed below: a. reduce the extent of an ecological community The proposal is expected to result in the further modification of approximately 200 m^2 of Alpine of already disturbed Sphagnum Bogs and Associated Fens EEC. The local occurrence of the community is estimated to be at least 100 ha in extent in association with Perisher Creek and Rock Creek. b. fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines; The proposal will not fragment the Alpine Sphagnum Bogs and Associated Fens EEC as it will affect a small area on the margins of a very large local occurrence. c. adversely affect habitat critical to the survival of an ecological community The local occurrence of the Alpine Sphagnum Bogs and Associated Fens EEC is estimated to be at least 100 ha in extent in association with Perisher Creek and Rock Creek. In this context, the habitat for the community within the development site is not considered to be critical to its survival.

Matters to be considered	Impact
	d. modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns The proposal has been designed so as to not modify or destroy the abiotic factors necessary for the survival of the Alpine Sphagnum Bogs and Associated Fens EEC. On the contrary, the proposal has been designed to mitigate against any potential impacts on surface or subsurface hydrology, primarily through the use of under-boring and sod replacement techniques. e. cause a substantial change in the species composition of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting. The development site does not support a unique assemblage of characteristic flora species of the Alpine Sphagnum Bogs and Associated Fens EEC that does not occur elsewhere within the local occurrence. Similarly, the fauna assemblage inhabiting the development site is likely to be distributed throughout the local occurrence and contiguous vegetation. Fauna species such as invertebrates, amphibians, reptiles, birds, and mammals utilising foraging substrates within the development site would not be restricted to the areas affected by the action proposed and would be highly likely to continue to utilise habitats in the remainder of the local occurrence. f. cause a substantial reduction in the quality or integrity of an ecological community, including, but not limited to: -assisting invasive species, that area harmful to the listed ecological community, to become established, or -causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants in the ecological community which kill or inhibit the growth of species in the ecological community The proposed action includes appropriate safeguards to limit the potential for invasive plants or pathogens to encroach upon the Alpine Sphagnum Bogs and Associated Fens EEC. It will also include safeguards which limit the potential for any chemicals or pollutants to enter the Alpine Sphagnum Bogs and Associated Fens EEC in association with the action proposed. g. interfere with the recovery of an ecological community The Alpine Sphagnum Bogs and Associated Fens EEC has recovered well since the cessation of grazing in the NSW alps and is one of the most common vegetation communities in alpine and subalpine habitats, and one of the best conserved vegetation communities in Australia. It has also recovered well since the 2003 wildfires. The proposed action will not reduce the extent of the Alpine Sphagnum Bogs and Associated Fens EEC, will not interfere with any wider recovery of the community, which is only potentially threatened by impacts associated with climate change, the re-introduction of grazing, horse and pig impacts or adverse fire regimes.
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.
In addition- any direct or indirect impact on Commonwealth lands	No. The project does not directly or indirectly affect Commonwealth land.

Appendix E - Staff CVs

CURRICULUM VITAE

Ryan Smithers

SENIOR ECOLOGIST

QUALIFICATIONS

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

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

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

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

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

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

RELEVANT PROJECT EXPERIENCE

Monaro and Werriwa Snow Gum Woodland and Grasslands Conservation Tender
Monaro Grasslands Conservation Tender
Kosi Walk Realignment Review of Environmental Factors
Diggings Campground Upgrade Review of Environmental Factors
Mount Perisher Chairlift Biodiversity Development Assessment Report
Merritt's 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
Sponar's 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
00033733/BAAS17061/22/00033734

Proposal Name
Leichhardt J-Bar

BAM data last updated *
16/06/2022

Assessor Name
Ryan Smithers

Assessor Number
BAAS17061

BAM Data version *
54

Proponent Names

Report Created
02/08/2022

BAM Case Status
Finalised

Assessment Revision
0

Assessment Type
Part 4 Developments (Small Area)

Date Finalised
02/08/2022

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

BAM Biodiversity Credit Report (Like for like)

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
637-Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	0.0	0	1	1
645-Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Not a TEC	0.0	1	0	1

637-Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions This includes PCT's: 518, 607, 637, 665, 681, 766, 788, 939, 1188, 1200, 1256, 1270, 1287, 1298, 1743, 1744, 1745	-	637_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.

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	Subalpine Woodlands <50%	645_Moderate	Yes	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
Cyclodomorphus praealtus / Alpine She-oak Skink	**645_Moderate**	0.0	1.00
Mastacomys fuscus / Broad-toothed Rat	**637_Good, 645_Moderate**	0.1	2.00

Credit Retirement Options

Like-for-like credit retirement options

Cyclodomorphus praealtus / Alpine She-oak Skink	Spp	IBRA subregion
	Cyclodomorphus praealtus / Alpine She-oak Skink	Any in NSW
Mastacomys fuscus / Broad-toothed Rat	Spp	IBRA subregion
	Mastacomys fuscus / Broad-toothed Rat	Any in NSW

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