

Proposed Guthries Chairlift, Charlotte Pass Ski Resort Biodiversity Development Assessment Report

Blyton Group



Department of Planning
Housing and Infrastructure

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Executive Summary

Eco Logical Australia Pty Ltd was engaged by the Blyton Group Pty Ltd to prepare a BDAR for the proposed construction of a new double seat detachable chairlift and associated works on Mount Guthrie, within the Charlotte Pass Ski Resort.

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

The development footprint is approximately 0.39 ha in size. The proposed development has been located to take advantage of existing disturbed areas and minimize the required clearing where possible. As a result, it is anticipated that the proposal will involve the clearing or further modification of only 0.36 ha of vegetation.

The development site supports four Plant Community Types (PCT):

- PCT 641 Alpine grassland/herbfield and open heathlands in Kosciuszko National Park, Australian Alps Bioregion
- PCT 643 Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion
- 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.

The vegetation within the development site is generally in good condition.

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 five threatened fauna species; *Burramys parvus* (Mountain Pygmy-possum), *Liopholis guthega* (Guthega Skink), *Mastacomys fuscus* (Broad-toothed Rat), *Petroica phoenicea* (Flame Robin), and *Ranunculus anemoneus* (Anemone Buttercup).

The proposal has been designed to avoid the boulderfield habitat in the lower parts of the lift alignment, which are known to be one of the key hibernacula habitats for the Mountain Pygmy-possum in NSW. The proposal, by utilizing the alignment and footprint of the existing lift and bottom station, will not require any clearing or other disturbance within the boulderfield habitat.

The Guthega Skink is well known from the Charlotte Pass Ski Resort. As such, assessment of the potential impacts of the proposal on the species included extensive targeted surveys for the Guthega Skink. The targeted Guthega Skink surveys demonstrated that the footprint of the top station does not appear to provide important habitat for the species with no observations of any Guthega Skinks within the top station footprint, despite 11.5 hours of targeted survey over two summers. The species does occur immediately adjacent to the top station location, where there were many observations of Guthega

Skinks and a number of burrow locations identified. The species was also detected adjacent to the existing access road and near the original location of Tower 6, which was subsequently moved.

Anecdotal evidence suggests that Guthega Skinks appear to be quite disturbance resilient as indicated by the healthy populations which remain in parts of the NSW Alps that have experienced considerable development over the years. They remain locally abundant at the junction of the Kosciuszko Road, Summit Road, and the Main Range walking track at Charlotte Pass despite extensive historic development and ongoing human activity during the winter and summer months.

The impacts on other threatened species and TECs associated with the proposed development will be minor given their abundance locally, the absence of minor nature of impacts on key habitats, the very small development footprint, and the extensive areas of similar habitats in contiguous vegetation.

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 six ecosystem credits and 108 species credits are required to offset the unavoidable impacts to the vegetation and habitats present within the development footprint.

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

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 <i>Biodiversity Conservation Act 2016</i>
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 <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
FM Act	NSW <i>Fisheries Management Act 1994</i>
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 27317. 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 developments site is located on Mount Guthrie within the Charlotte Pass Ski Resort.

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

1.2. Brief description of the proposal

The proposed development comprises a new double seat detachable chairlift and associated works on Mount Guthrie, within the Charlotte Pass Ski Resort and Kosciuszko National Park. The new chairlift will replace the Guthries high speed Poma, built in 1963, and will be located on the same alignment. The proposed development involves bottom and top stations in the same location as the existing lift, and seven towers.

The proposed development has been designed to avoid, minimise, mitigate and offset impacts on biodiversity, and as such construction access has been limited primarily to the existing access tracks and roads, with temporary construction access proposed to towers 2-4 and 6. It is envisaged that access to these towers for construction of the tower footings will involve only one or two excavator movements. The access disturbance footprint will be a maximum of 4 m wide (the width required to accommodate a small excavator). Access to towers 1, 5 and 7 will be via the existing access tracks or roads. The construction access, and the proposed chairlift generally, has been designed to avoid impacts on habitats for the Mountain Pygmy-possum, Guthega Skink and alpine bogs, and to minimise impacts on vegetation and fauna habitats generally. This includes removing the existing list towers over-snow.

The disturbance footprint for the tower footing construction will be 8 m by 8 m with slightly larger disturbance footprints (excavation and laydown areas) for the bottom and top stations. Both the location of the bottom and top station are already modified in association with the existing lift.

The concrete pours for the top station and towers, the installation of the towers, is proposed to be undertaken by helicopter.

The proposal is further identified in **Figure 3** and **Photo 1 – Photo 8**.



Photo 1: The proposed chairlift will be located on the existing alignment of the Guthries Poma and will take advantage of the existing disturbed area for the chairlift bottom station and Tower 1. Tower 2 will be located above the boulderfield, which is a key habitat for the Mountain Pygmy-possum, enabling the removal of the existing Tower 1, which is located within the boulderfield.



Photo 2: Access to Tower 2 and Tower 3 will require 1-2 excavator movements from Kosciuszko Road down the existing lift alignment.



Photo 3: An existing access track (the approximate alignment of which is shown in red) will be used for construction access above Kosciuszko Road.



Photo 4: The existing access track will be supplemented with gravel, where necessary, to enable construction access. The access disturbance footprint will be a maximum of 4 m in width.



Photo 5: The top station (yellow shape) will be located just to the east of the existing lift operators hut. A laydown area (red shape) will take advantage of the flat open area to the west of the top station.



Photo 6: Tower 4 will be accessed directly from Kosciuszko Road.



Photo 7: Tower 6 was moved further downhill to avoid likely Guthega Skink burrows.



Photo 8: Access to Tower 6 will involve walking an excavator downhill from the existing access track to the proposed tower location. Once the footing is complete, the excavator will be walked downhill to the existing access road, as this approach will result in less disturbance than walking the excavator back up the steep slope. The access route has been selected to avoid known Guthega Skink habitat.

1.3. Development site footprint

It is anticipated that the proposed development will result in the removal or further modification of a small amount of the native vegetation (0.36 ha) for the top station, tower footings, laydown areas and construction access. Approximately 0.03 ha of exotic grassland will also be disturbed in association with the bottom station.

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

1.4. Sources of information used

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

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

1.5. Legislative context

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

Table 1: Legislative context

Name	Relevance to the project	Report Section
Commonwealth		
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	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		
<i>Environmental Planning and Assessment Act 1979</i>	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.	-
<i>Biodiversity Conservation Act 2016</i>	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.	-

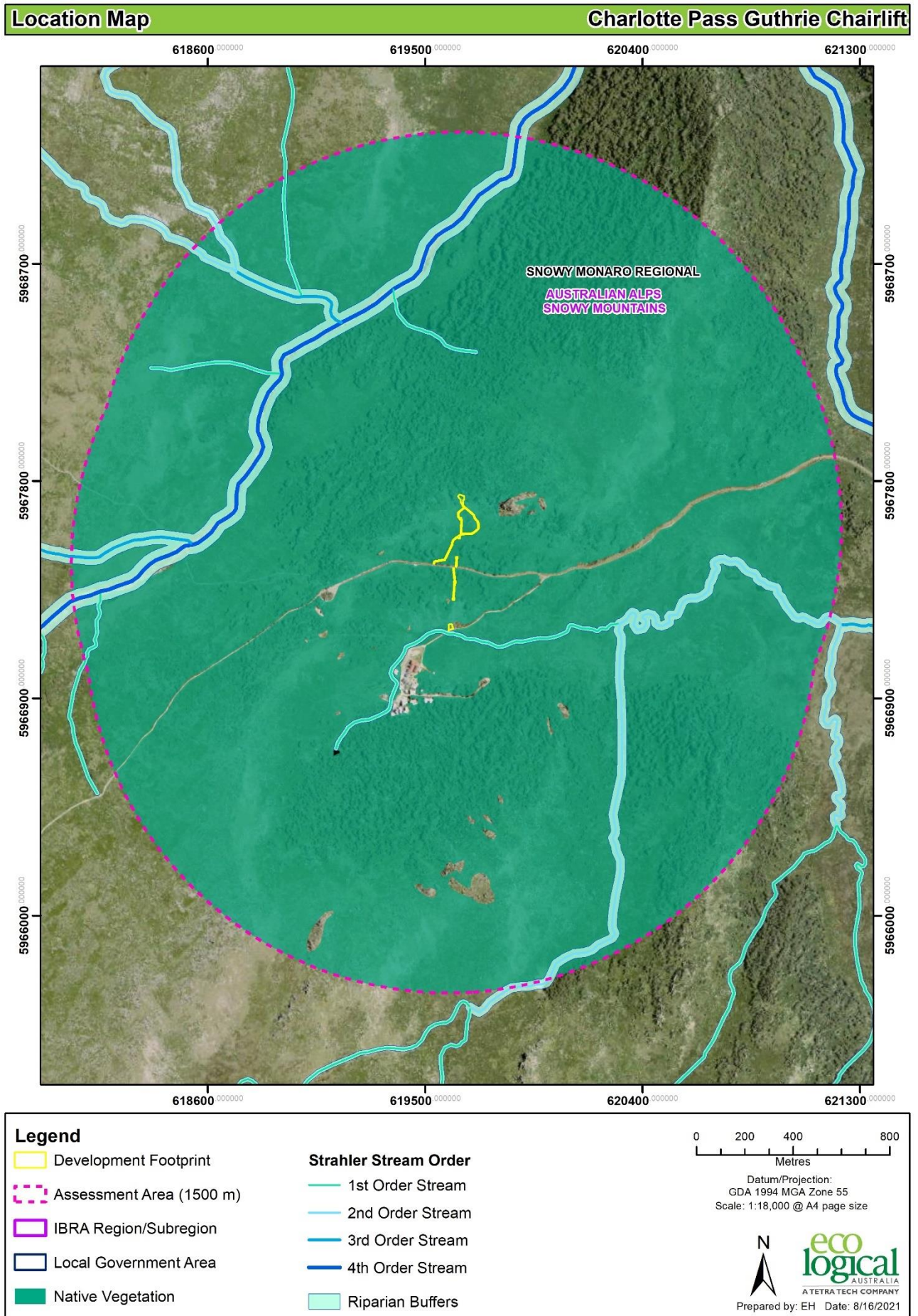


Figure 1: Location map

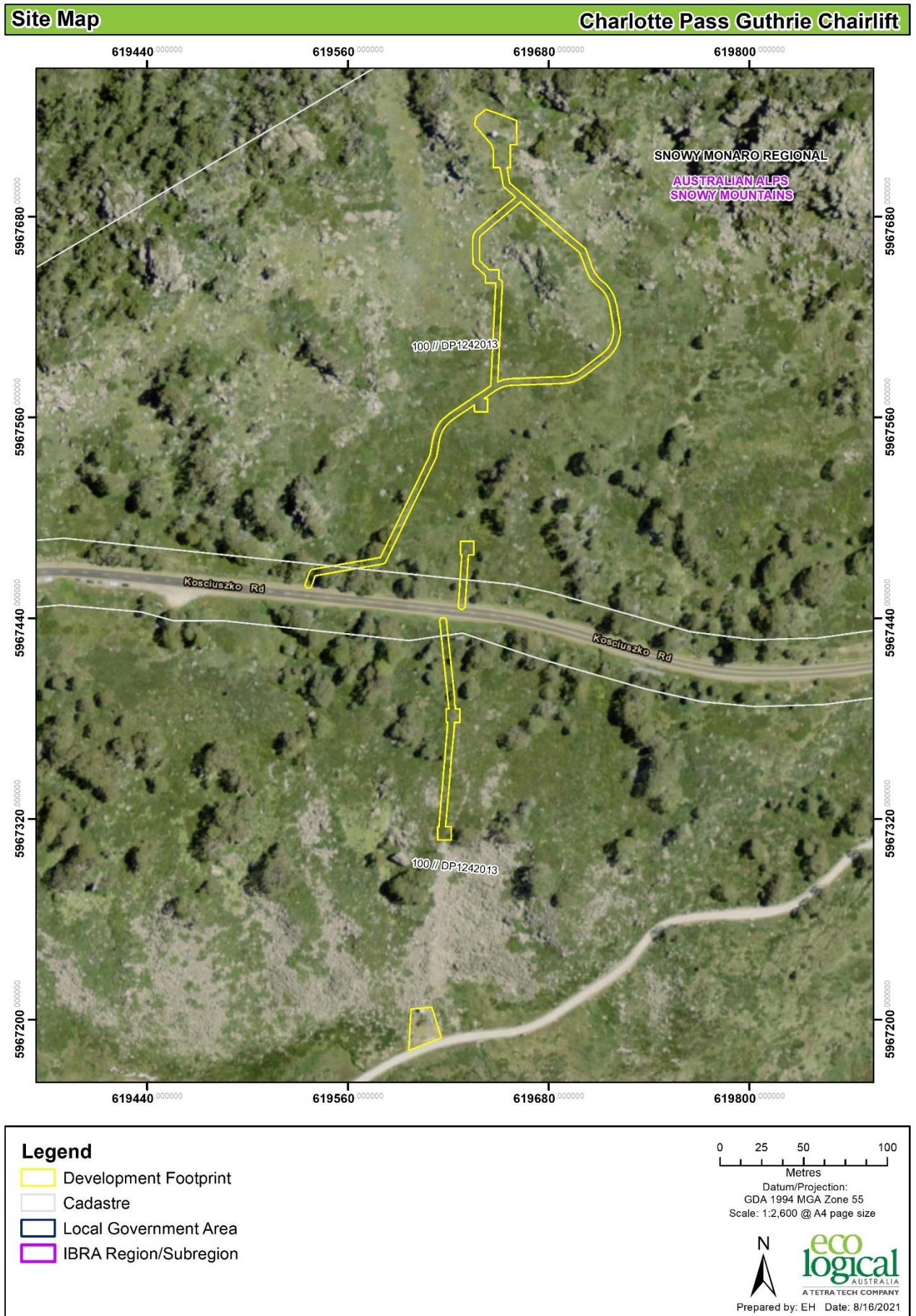


Figure 2: Site map

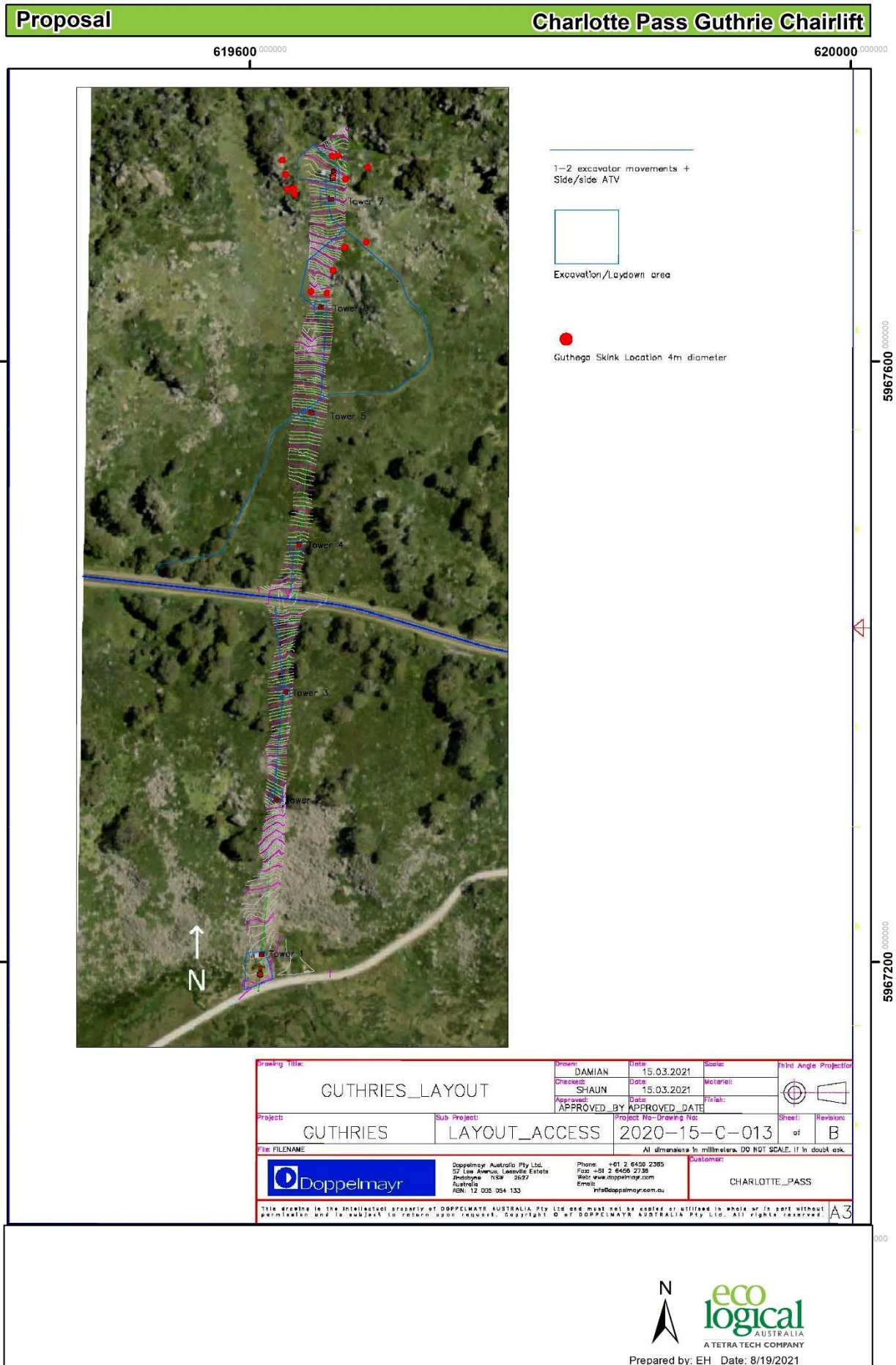


Figure 3: The proposal

2. Landscape features

The site-based method was applied for this assessment, therefore 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	Spencers Creek	Spencers Creek	NSW LPI Waterway mapping
Estuaries and wetlands	-	-	NSW directory of important wetlands
Connectivity of different areas of habitat	The development site is connected to vast areas of native vegetation.	-	Aerial imagery
Geological features of significance and soil hazard features	The rock outcropping in the development site is very typical of the locality and not of any particular geological significance.	-	Site observation
Areas of Outstanding Biodiversity Value	-	-	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	99	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 between 3 November and 15 December 2020 (**Figure 5**).

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. A plot was not undertaken for PCT 645, consistent with the BAM, as it was clear that, as the project design progressed, PCT 645 would not be the predominate PCT within the development site.

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
643	Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion	1
645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	0
641	Alpine grassland/herbfield and open heathlands in 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 as identified in Table 3. Further detail with respect to the PCTs identified within the development site are presented in **Table 4**, **Photo 9 – Photo 12**, and their distribution identified in **Figure 4**. The development site also contained approximately 0.026 ha of exotic vegetation which does not conform to a native PCT.



Photo 9: Typical PCT 641 within the development site showing the low grassland/herbfield dominated by *Celmisia costiniana* and *Poa fawcettiae*.



Photo 10: Transitions to adjoining more poorly drained areas of PCT 641 include increasing amounts of *Olearia phlogopappa* and *Empodisma minus*.



Photo 11: Typical PCT 637 within the development site and surrounds, dominated by *Baeckea gunniana*, with patches of *Poa* spp., *Empodisma minus* and Sphagnum moss around small fens.



Photo 12: Typical PCT 643 which dominates the development site below Kosciuszko Road and is often ecotonal with PCT 645 and which is characterised by greater Snow Gum cover.

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	0.03	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	0.08	0
645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Subalpine Woodlands	Grassy Woodland	0.07	5
641	Alpine grassland/herbfield and open heathlands in Kosciuszko National Park, Australian Alps Bioregion	Alpine Herbfields	Alpine Complex	0.18	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 and the final scientific determinations for TECs. There are only a small number of PCTs in the alpine and sub alpine and there are no other suitable 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	-
643	Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion	-
645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, 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**. The other PCTs which occur within the development site do not comprise listed TECs under the BC and/or the EPBC Act.

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		0.03	Endangered	Alpine Sphagnum Bogs and Associated Fens		0.03		

3.5. Vegetation integrity assessment

3.5.1. Vegetation zones

Four vegetation zones were identified on the development site based on the broad condition state of each PCT. A total of three vegetation integrity survey plots were collected on the development site, which is consistent with the BAM (**Table 7**). Descriptions of vegetation zones are provided in **Table 8**, **Table 9**, Table 10 and Table 11.

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	High	0.03	101	1	1
2	643	Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion	High	0.08	101	1	1
3	645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	High	0.07	101	0	0
4	641	Alpine grassland/herbfield and open heathlands in Kosciuszko National Park, Australian Alps Bioregion	High	0.18	101	1	1
Total				0.36		3	3

3.5.2. Patch size

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

Table 8: Zone 1 PCT 637 High 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.		
Characteristic canopy trees	It is characteristically treeless although occasional individuals of <i>Eucalyptus niphophila</i> may occur around rocks or other micro-habitats that improve drainage.		
Characteristic mid-storey	<i>Baeckea</i> spp.		
Characteristic groundcovers	<i>Empodisma minus</i> , <i>Richea continentis</i> , <i>Sphagnum</i> sp., <i>Stylidium graminifolium</i> , <i>Carex gaudichaudiana</i> , <i>Carpha nivicola</i> , <i>Astelia psychrocharis</i> , <i>Aciphylla simplicifolia</i> , <i>Oreobolus distichus</i> , <i>Carex echinata</i> , <i>Cotula alpina</i> , <i>Ranunculus gunnianus</i> , <i>Ranunculus graniticola</i> , <i>Celmisia</i> spp., <i>Poa costiniana</i> , <i>Trisetum spicatum</i> , <i>Rytidosperma nivicola</i> , <i>Deyeuxia crassiuscula</i> , <i>Pimelea alpina</i> , <i>Luzula modesta</i> , <i>Chionochloa frigida</i> .		
Mean native richness	18		
Exotic species / HTW cover	No		
Condition	High condition		
Variation and disturbance	The zone is impacted by the existing access track to the top station of the existing lift.		
No. sites sampled	1		
Threatened flora species	None		
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
45.9	2.2	-	10



Table 9: Zone 2 PCT 643 High 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 <i>Eucalyptus niphophila</i> may occur.		
Characteristic mid-storey	<i>Grevillea australis</i> , <i>Ozothamnus cupressoides</i> , <i>Prostanthera cuneata</i> , <i>Nematolepis ovatifolia</i> , <i>Ozothamnus secundiflorus</i> , <i>Ozothamnus alpinus</i> , <i>Olearia phlogopappa</i> , <i>Orites lancifolius</i> , <i>Oxylobium ellipticum</i> , <i>Podocarpus lawrencei</i> .		
Characteristic groundcovers	<i>Acaena novae-zelandiae</i> , <i>Asperula gunnii</i> , <i>Carex breviculmis</i> , <i>Lycopodium fastigiatum</i> , <i>Pimelea alpina</i> , <i>Poa fawcettiae</i> , <i>Polystichum proliferum</i> , <i>Senecio gunnii</i> .		
Mean native richness	24		
Exotic species / HTW cover	<i>Acetosella vulgaris</i>		
Condition	High condition		
Variation and disturbance	The community is quite variable within the development site but overwhelmingly in excellent condition. It includes the largely rock dominated boulder field below Kosciuszko Road and rocky areas with much higher shrub cover.		
No. sites sampled	1		
Threatened flora species	None		
Fauna habitats	Primarily habitat of the Guthega Skink, Broad-toothed Rat and Mountain Pygmy-possum.		
Composition	Structure	Function	Vegetation Integrity Score
44.3	55.3	-	49.5



Table 10: Zone 3 PCT 645 High 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	<i>Eucalyptus niphophila</i> .		
Characteristic mid-storey	<i>Grevillea australis</i> , <i>Ozothamnus cupressoides</i> , <i>Prostanthera cuneata</i> , <i>Nematolepis ovatifolia</i> , <i>Ozothamnus secundiflorus</i> , <i>Ozothamnus alpinus</i> , <i>Olearia phlogopappa</i> , <i>Orites lancifolius</i> , <i>Oxylobium ellipticum</i> .		
Characteristic groundcovers	<i>Acaena novae-zelandiae</i> , <i>Asperula gunnii</i> , <i>Carex breviculmis</i> , <i>Lycopodium fastigiatum</i> , <i>Pimelea alpina</i> , <i>Poa fawcettiae</i> , <i>Polystichum proliferum</i> , <i>Senecio gunnii</i> .		
Mean native richness	-		
Exotic species / HTW cover	<i>Acetosella vulgaris</i>		
Condition	High condition		
Variation and disturbance	The community is overwhelmingly in excellent condition within the development site and surrounds, however it has been impacted to a limited extent by the access tracks and clearing of trees under the existing lift alignment.		
No. sites sampled	0		
Threatened flora species	<i>Ranunculus anemoneus</i>		
Fauna habitats	Broad-toothed Rat and Flame Robin.		
Composition	Structure	Function	Vegetation Integrity Score
NA	NA	NA	NA



Table 11: Zone 4 PCT 641 High 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 <i>Eucalyptus niphophila</i> may occur.		
Characteristic mid-storey	<i>Grevillea australis</i> , <i>Nematolepis ovatifolia</i> , <i>Ozothamnus secundiflorus</i> , <i>Olearia phlogopappa</i> , <i>Oxylobium ellipticum</i> , <i>Melicytus dentatus</i> .		
Characteristic groundcovers	<i>Epacris gunni</i> , <i>Pimelea alpina</i> , <i>Celmisia costiniana</i> , <i>Craspedia</i> spp., <i>Euphrasia collina</i> subsp. <i>diversicolor</i> , <i>Microseris lanceolata</i> , <i>Erigeron bellidioides</i> , <i>Lycopodium fastigiatum</i> , <i>Oreomyrrhis eriopoda</i> , <i>Poa</i> spp.		
Mean native richness	29		
Exotic species / HTW cover	<i>Acetosella vulgaris</i>		
Condition	High condition		
Variation and disturbance	The community is quite variable within the development site but overwhelmingly in excellent condition.		
No. sites sampled	1		
Threatened flora species	<i>Ranunculus anemoneus</i>		
Fauna habitats	Guthega Skink and Alpine She-oak Skink.		
Composition	Structure	Function	Vegetation Integrity Score
76.3	33.3	NA	50.4



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**.

Despite being in excellent condition, the BAMC calculated the VI score for Zone 1 as 10, below the threshold requiring offsetting. This is largely a result of the benchmarks for PCT 643 which assume a high cover for the grass and grasslike and forb growth form groups and a low shrub cover, despite the fact that alpine bogs, such as those which occur in and surrounding the development site, often have a very high shrub cover.

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	High	0.03	45.9	2.2	NA	NA	10
4	641	High	0.33	76.3	33.3	NA	NA	50.4

3.6. Use of local data

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

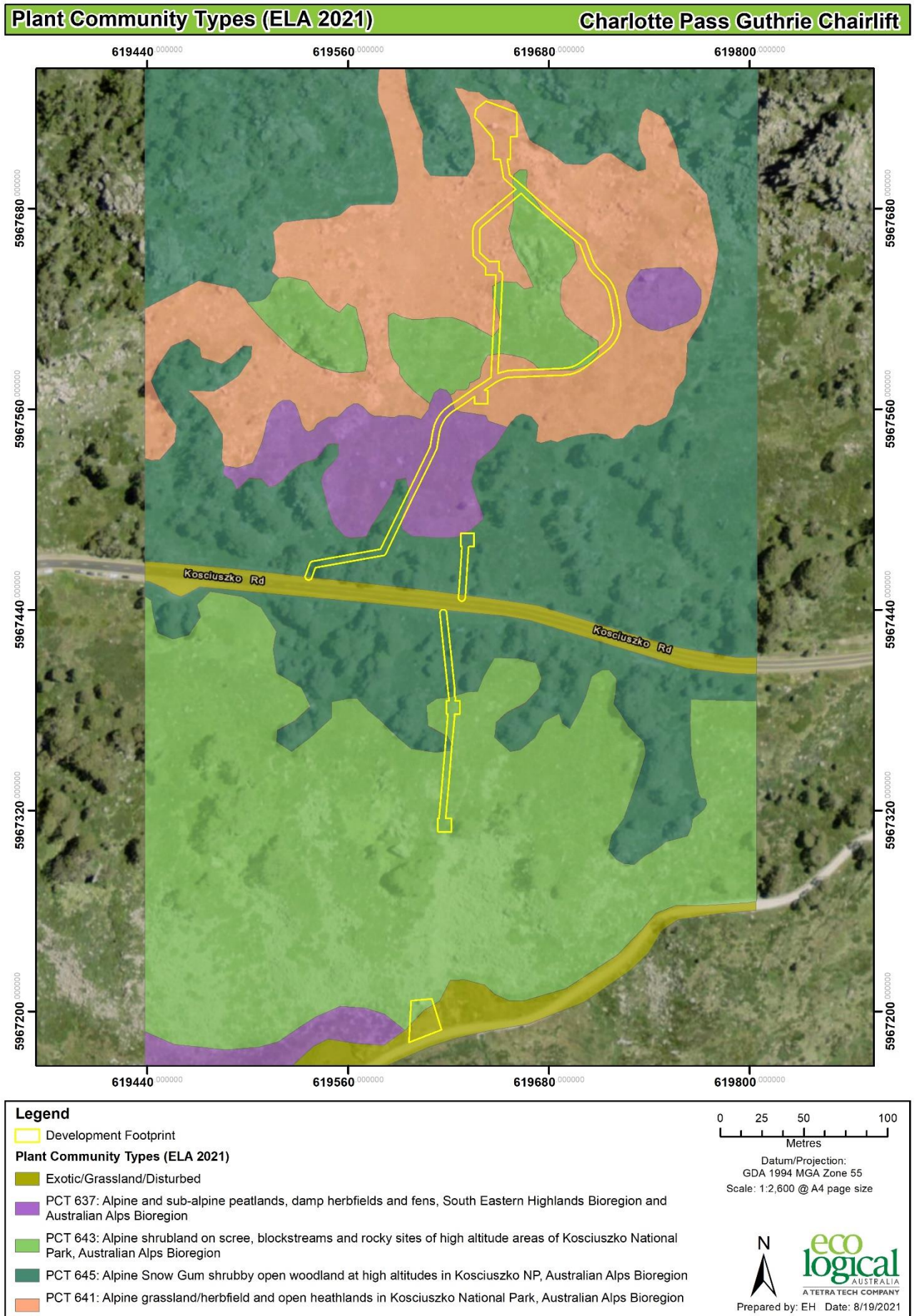


Figure 4: Plant Community Types

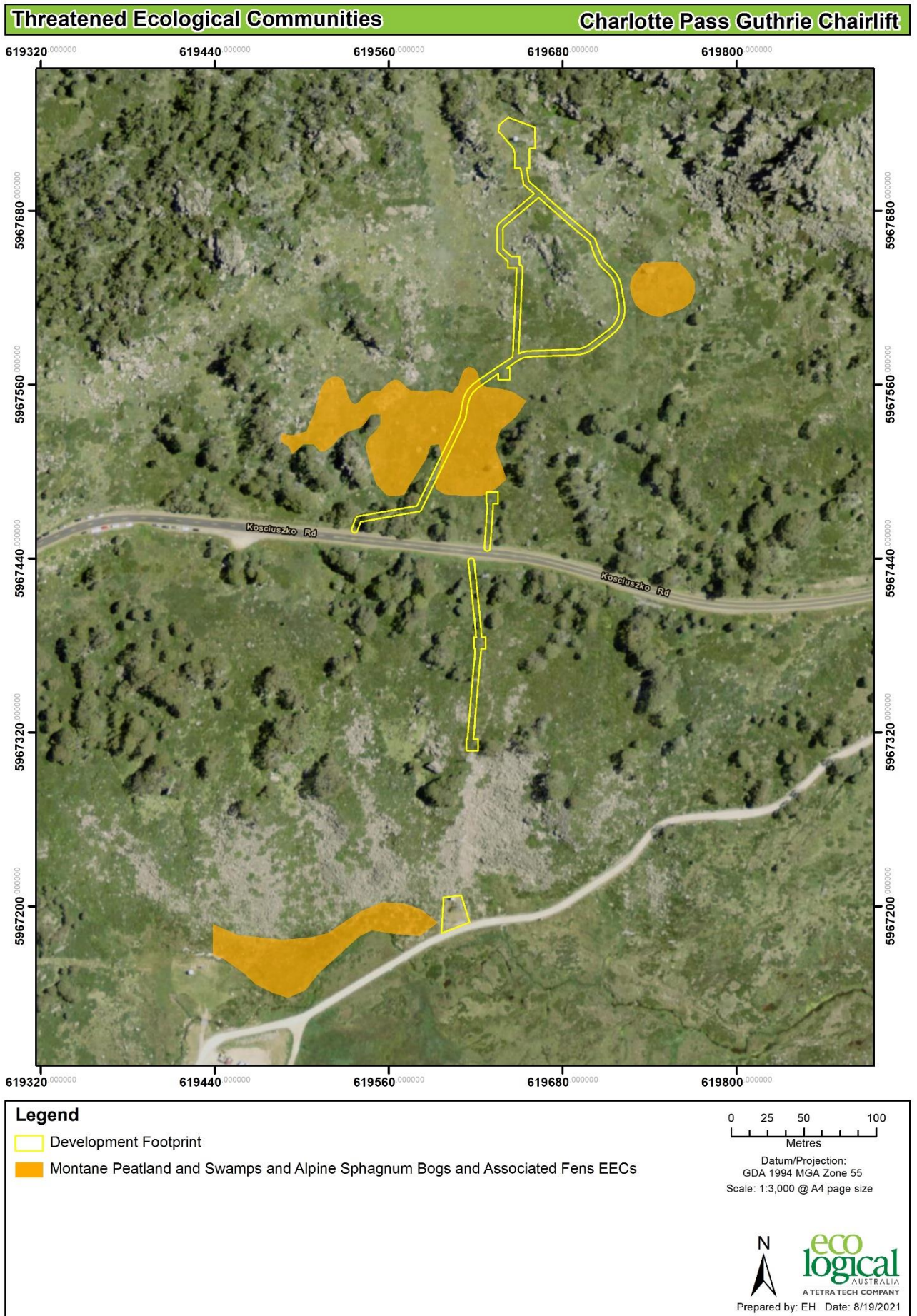


Figure 5: Threatened Ecological Communities

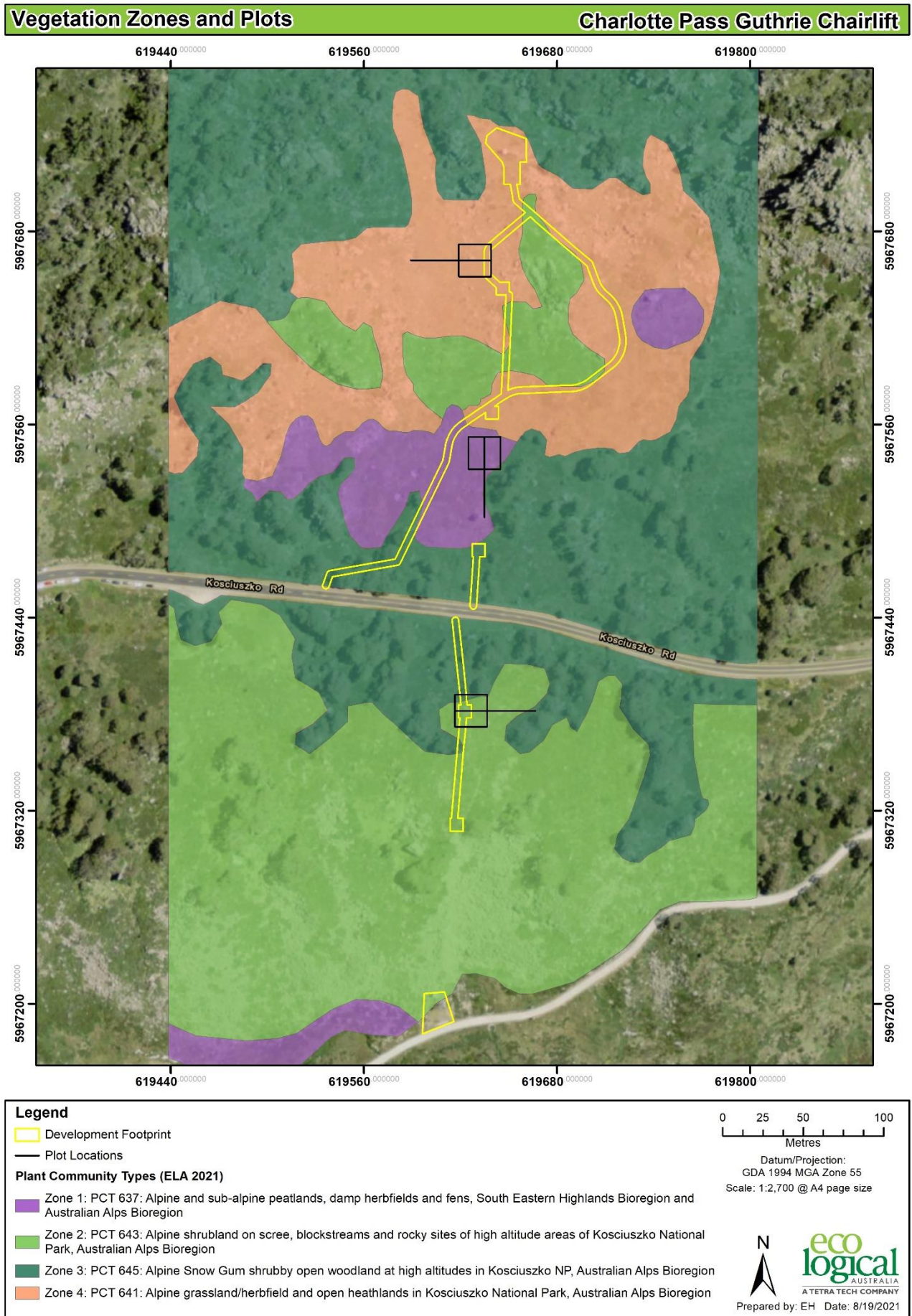


Figure 6: Vegetation zones and plots

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 16**.

Ecosystem credit species which have been excluded from the assessment and relevant justifications for exclusion are included in **Table 17**.

4.2. Species credit species

4.2.1. Identification of species credit species

Species credit species that require further assessment on the development site (i.e. candidate species), their associated habitat constraints, geographic limitations and sensitivity to gain class are included in **Table 18**. Three additional species credit species were added as candidate species, *Liopholis guthega* (Guthega Skink), *Mastacomys fuscus* (Broad-toothed Rat) and *Ranunculus anemoneus* (Anemone Buttercup), as they are well known from the Charlotte Pass resort.

4.2.2. Assessment of habitat constraints and vagrant species

Justification for the exclusion of other candidate species credit species is provided in **Table 19**.

4.2.3. Candidate species requiring further assessment

Three 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 and Anemone Buttercup.

4.3. Targeted surveys

The streamlined assessment method only requires targeted surveys for candidate SAI species. The development site does not meet the habitat constraints of any of the candidate species credit species that are candidate SAI species. However, as the Guthega Skink, Broad-toothed Rat and Anemone Buttercup are well known from the Charlotte Pass resort, surveys for these species and other threatened species with the potential to occur within the development footprint i.e. *Rytidosperma vickeryae* (Perisher Wallaby-grass), *Carex raleighii* (Raleigh Sedge), *Carex archeri* (Archer's Carex), *Euphrasia scabra* (Rough Eyebright), *Argyrotegium nitidulum* (Shinning Cudweed), and *Pterostylis oreophila* (Blue-tongued Greenhood) were undertaken to ensure the proposed development avoids and minimises impacts as far as is possible.

Targeted surveys for species credit species were undertaken within the development site and immediate surrounds on the dates outlined in Table 13. The results of the surveys shown in Figure 7 and as individual species polygons on Figure 8.

4.3.1. Species credit species included in the assessment

Three species credit species, the Guthega Skink, Broad-toothed Rat and Anemone Buttercup, have been included in the assessment as the proposed development will impact on known habitat for these species. Species polygons for these species are shown in **Figure 8**.

Table 13: Targeted surveys

Date	Surveyors	Target species
14 December 2020	Ryan Smithers	Guthega Skink, Broad-toothed Rat, Blue-tongued Greenhood and Anemone Buttercup
15 December 2020	Ryan Smithers	Guthega Skink, Broad-toothed Rat, Blue-tongued Greenhood and Anemone Buttercup
16 February 2020	Ryan Smithers	Guthega Skink, Perisher Wallaby Grass, Raleigh Sedge, Archer's Carex, Rough Eyebright, Shinning Cudweed and Blue-tongued Greenhood.
9 March 2020	Ryan Smithers	Guthega Skink, Broad-toothed Rat and Anemone Buttercup

Weather conditions during the targeted surveys are outlined in **Table 14**.

Table 14: Weather conditions

Date	Rainfall (mm)	Minimum temperature 0 ^c	Maximum temperature 0 ^c
14 December 2020	-	17	19
15 December 2020	-	15	19
16 February 2020	-	8	15
9 March 2020	-	13	15

Survey effort undertaken at the development site is outlined in **Table 15**.

Table 15: Survey effort

Method	Habitat (ha)	Stratification units	Total effort	Target species
Target Searches	1	Suitable habitats within and immediately surrounding the development site	11.5 person hours	Guthega Skink, Broad-toothed Rat and Anemone Buttercup
Targeted threatened flora searches	0.06	Suitable habitats within and immediately surrounding the development site	1 person hour	Perisher Wallaby-grass, Raleigh Sedge, Archer's Carex, Shinning Cudweed, and Rough Eyebright.

The targeted surveys resulted in the detection of three species credit species, the Broad-toothed Rat, Guthega Skink and Anemone Buttercup.

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

The Guthega Skink is well known from the Charlotte Pass Ski Resort. As such, assessment of the potential impacts of the proposal on the species included extensive targeted surveys for the Guthega Skink. Survey effort was concentrated around suitable habitat above the Kosciuszko Road, however the surveys also included habitats below Kosciuszko Road. Surveys for the Guthega Skink largely comprised the visual inspection method which involves ecologists remaining stationary or moving slowly through potentially suitable habitat searching, with the aid of binoculars, for reptiles basking, primarily on rocks.

The targeted Guthega Skink surveys demonstrated that the footprint of the top station does not provide important habitat for the species with no observations of any Guthega Skinks within the top station footprint, despite 11.5 hours of targeted survey over two summers. The species does occur immediately adjacent to the top station location, where there were many observations of Guthega Skinks and a number of burrow locations identified, as shown in **Figure 7** and **Photo 13 – Photo 17**. The species was also detected adjacent to the existing access road and near the original location of Tower 6, which was subsequently moved, as shown in **Figure 7** and **Photo 15** and **Photo 7**.



Photo 13: Adult and juvenile Guthega Skinks were observed on several occasions to the immediate east of the top station.



Photo 14: Guthega Skink basking near burrow approximately 4 m to the east of the footprint for the top station works.



Photo 15: Guthega Skinks were not observed in this broken rock area, which will be impacted by the top station footprint despite five sessions of targeted survey where they were observed in adjacent habitats to the east, south and west.



Photo 16: Guthega skink burrow occurs to the immediate east of the existing access track. This area will be fenced off during construction and vehicle access diverted slightly to the west to avoid impacts.

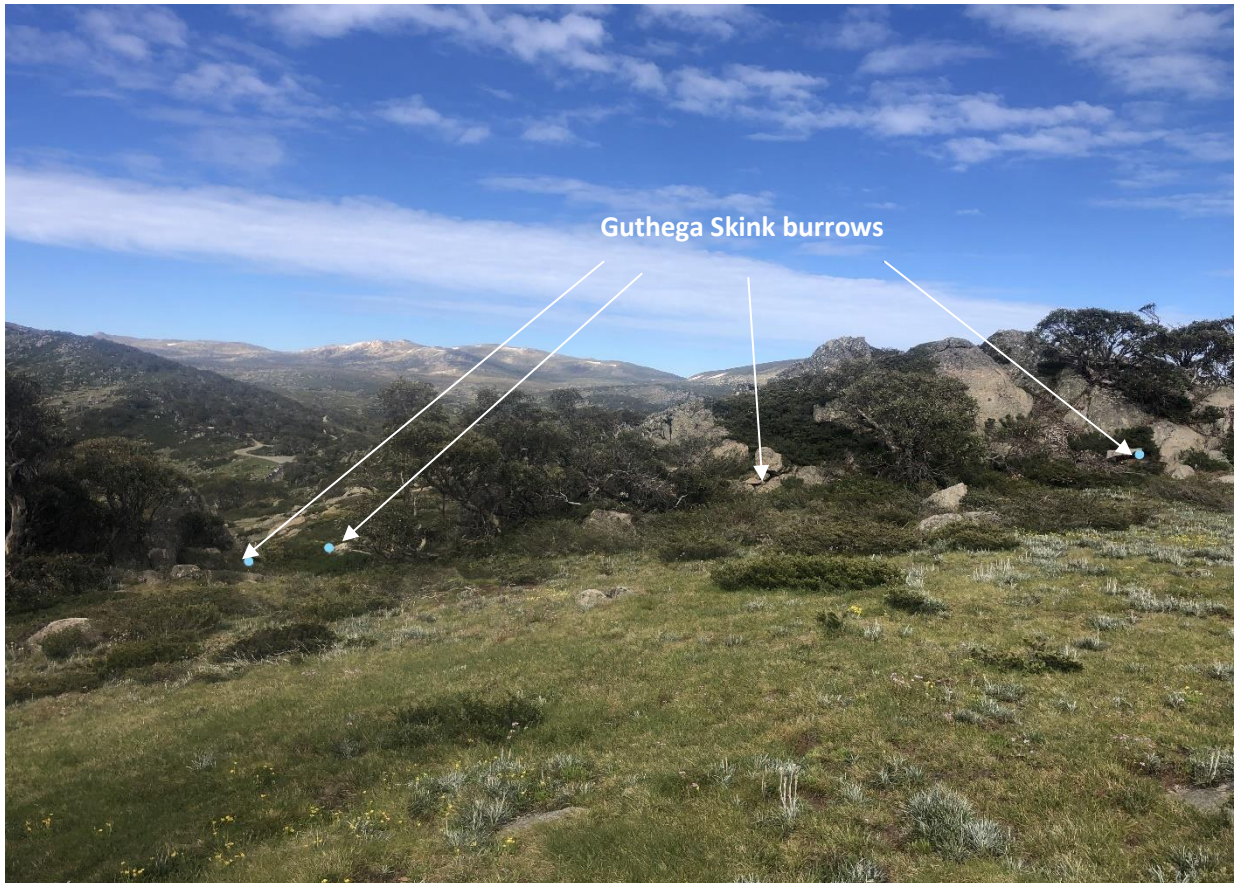


Photo 17: Guthega Skinks were regularly observed around the rock outcropping to the immediate west of the top station where a number of burrows occur.



Photo 18: The author has observed many Guthega Skinks in recent years along the ridge between Mount Guthrie and Mount Stillwell, including many around the turning circle at the end of the Kosciuszko Road and the Kosi and Stillwell trail heads. This area, despite a range of historic and ongoing disturbances, supports a large population of the species.



Photo 19: Adult Guthega Skink in the tree island created by the turning circle at the end of the Kosciuszko Road. Mount Guthrie in the background.



Photo 20: Adult Guthega Skink using old rock and earth loading ramp at the end of the Kosciuszko Road.

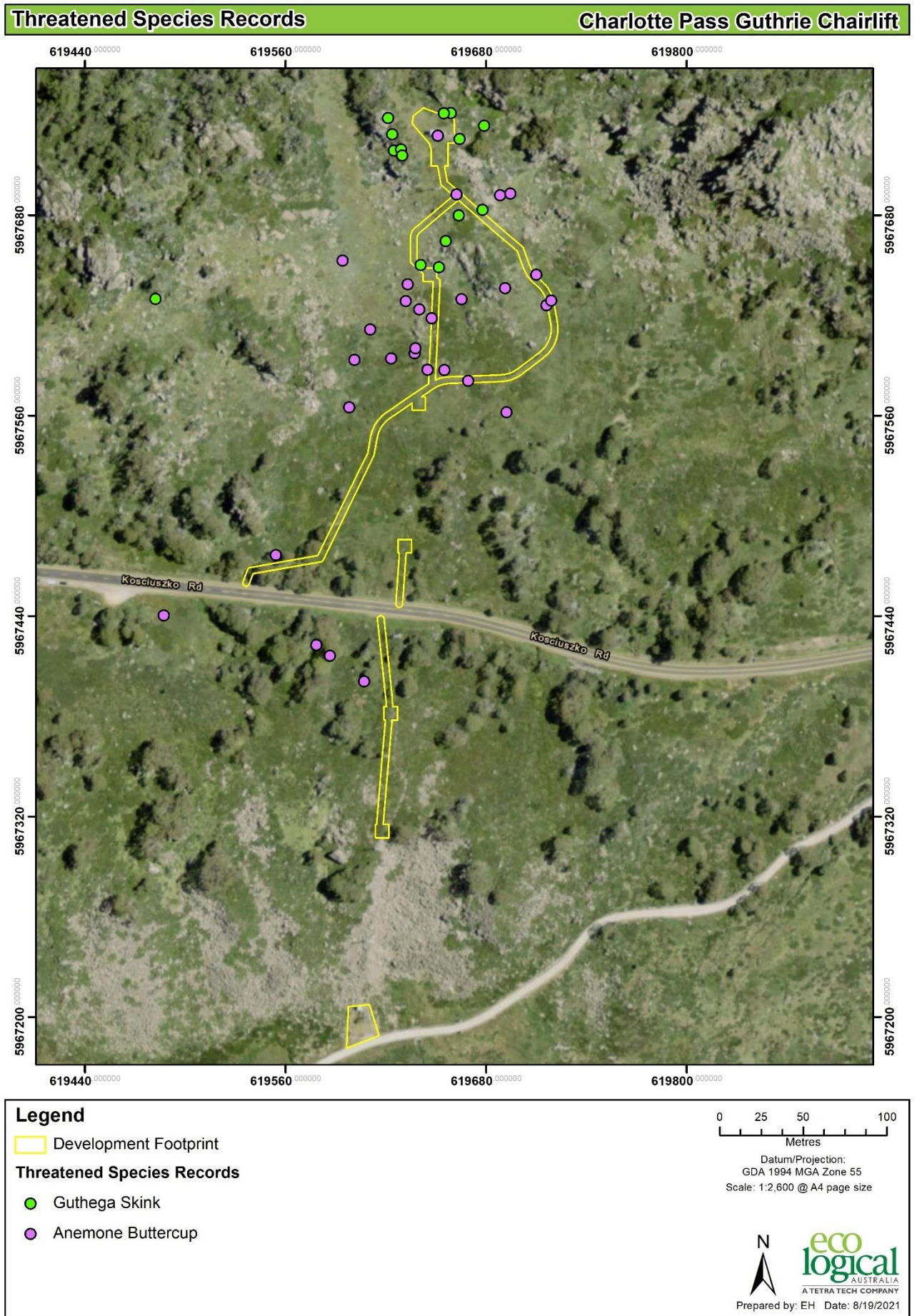


Figure 7: Threatened species records

Table 16: Predicted ecosystem credit species

Species	Common Name	Habitat Constraints	Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow			Moderate	Vulnerable	Not Listed
<i>Hieraaetus morphnoides</i> (Foraging)	Little Eagle	-	-	Moderate	Vulnerable	Not Listed
<i>Hirundapus caudacutus</i>	White-throated Needletail	-	-	High	Not Listed	Vulnerable
<i>Pachycephala olivacea</i>	Olive Whistler	-	-	Moderate	Vulnerable	Not Listed
<i>Petroica phoenicea</i>	Flame Robin	-	-	Moderate	Vulnerable	Not Listed

Table 17: Justification for exclusion of predicted ecosystem credit species

Species	Common Name	BC Act listing status	EPBC Act Listing status	Justification for exclusion of species
<i>Pachycephala olivacea</i>	Olive Whistler	Vulnerable	Not Listed	This species is associated with taller forests and subalpine woodlands with a dense understory, particularly in more substantial gullies than those which occur within the development site and immediate surrounds.

Table 18: Candidate species credit species

Species	Common Name	Habitat Constraints	Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status
<i>Argyrotegium nitidulum</i>	Shining Cudweed	-	-	Moderate	Vulnerable	Vulnerable
Mountain Pygmy-possum	<i>Burramys parvus</i>	-	Sth - Nth range between Dead Horse Gap and Mt Jagungle	High	Endangered	Endangered
Archer's Carex	<i>Carex archeri</i>	Other Treeless vegetation above 1000 m in altitude	Above 1400 m	High	Endangered	Not Listed
Rough Eyebright	<i>Euphrasia scabra</i>	-	-	High	Endangered	Not Listed
Guthega Skink	<i>Liopholis guthega</i>	Granite substrate and decomposing granite soils Rocky areas including sub-surface boulders	-	High	Endangered	Endangered
Broad-toothed Rat	<i>Mastacomys fuscus</i>	-	-	High	Vulnerable	Vulnerable

Species	Common Name	Habitat Constraints	Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status
Southern Corroboree Frog	<i>Pseudophryne corroboree</i>	NA/Swamps Within 200 m of high montane and sub-alpine bog or ephemeral pool environments	above 1000 m asl	Very High	Critically Endangered	Critically Endangered
Northern Corroboree Frog	<i>Pseudophryne pengilleyi</i>	-	above 700 m asl	Moderate	Critically Endangered	Critically Endangered
Blue-tongued Greenhood	<i>Pterostylis oreophila</i>	-	-	High	Critically Endangered	Critically Endangered
Perisher Wallaby-grass	<i>Rytidosperma vickeryae</i>	-	-	High	Endangered	Not Listed
Anemone Buttercup	<i>Ranunculus anemoneus</i>	Treeless vegetation above 1000 m	Above 1400 m	High	Vulnerable	Vulnerable

Table 19: 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
Mountain Pygmy-possum	<i>Burramys parvus</i>	Endangered	Endangered	High	The proposed development has been designed to avoid impacts within the core habitats for the species.
<i>Argyrotegium nitidulum</i>	Shining Cudweed	Vulnerable	Vulnerable	Moderate	The species was not detected within the development site or immediate surrounds despite targeted surveys.
Archer's Carex	<i>Carex archeri</i>	Endangered	Not Listed	High	There is only a very small amount of potential habitat for the species in the development site. The potential habitat was searched for the species, which was not detected.
Rough Eyebright	<i>Euphrasia scabra</i>	Endangered	Not Listed	High	The species was not detected within the development site or immediate surrounds despite targeted surveys.
Southern Corroboree Frog	<i>Pseudophryne corroboree</i>	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 and is no longer present at its former southern limit at Smiggin Holes. It is highly unlikely that it would occur within the development site.
Northern Corroboree Frog	<i>Pseudophryne pengilleyi</i>	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	<i>Pterostylis oreophila</i>	Critically Endangered	Critically Endangered	High	The species was not detected within the development site or immediate surrounds despite targeted surveys.
Perisher Wallaby-grass	<i>Rytidosperma vickeryae</i>	Endangered	Not Listed	High	The species was not detected within the development site or immediate surrounds despite targeted surveys

Targeted surveys were not undertaken for the Mountain Pygmy-possum, given that the species is well known from the boulderfield in the lower parts of the lift alignment, as has been surveyed there annually for several decades. The proposed development has been designed to avoid impacts on this boulderfield and will reduce other potential impacts on the species by removing the existing lift tower that is located in the boulderfield and by removing the need for a lift track over the boulderfield during the winter. Surveys were not undertaken for the Southern Corroboree Frog or the Northern Corroboree Frog given the absence of important or suitable habitats for these species within the development footprint.

The Anemone Buttercup and Broad-toothed Rat were surveyed for opportunistically within the development site and immediate surrounds between December 2020 and March 2021. The Anemone Buttercup occurs extensively on Mount Guthrie and elsewhere in the locality. It is estimated that up to 50 Anemone Buttercup individuals may be impacted by the proposed development. Many more individuals were observed in habitats immediately adjacent to the development site that will not be impacted by the proposed development. Broad-toothed Rat scats were observed at several locations through the study area and suitable rocky and heathy habitats within the development site were considered to be occupied by the species.

All the vegetation within the development site adjacent to those areas where Guthega Skinks were recorded were considered to comprise Guthega Skink habitat.

Following completion of targeted surveys, the species credit species included in the assessment are outlined in Table 20.

Table 20: Species credit species included in the assessment

Species	Common Name	Species presence	Geographic limitations	Habitat count	(ha) / Biodiversity Risk Weighting
Anemone Buttercup	<i>Ranunculus anemoneus</i>	Yes	Other Treeless vegetation above 1000 m in altitude Above 1400 m	50	2
Broad-toothed Rat	<i>Mastacomys fuscus</i>	Yes	-	0.17	2
Guthega Skink	<i>Liopholis guthega</i>	Yes	-	0.13	2

4.4. Identification of prescribed additional biodiversity impact entities

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

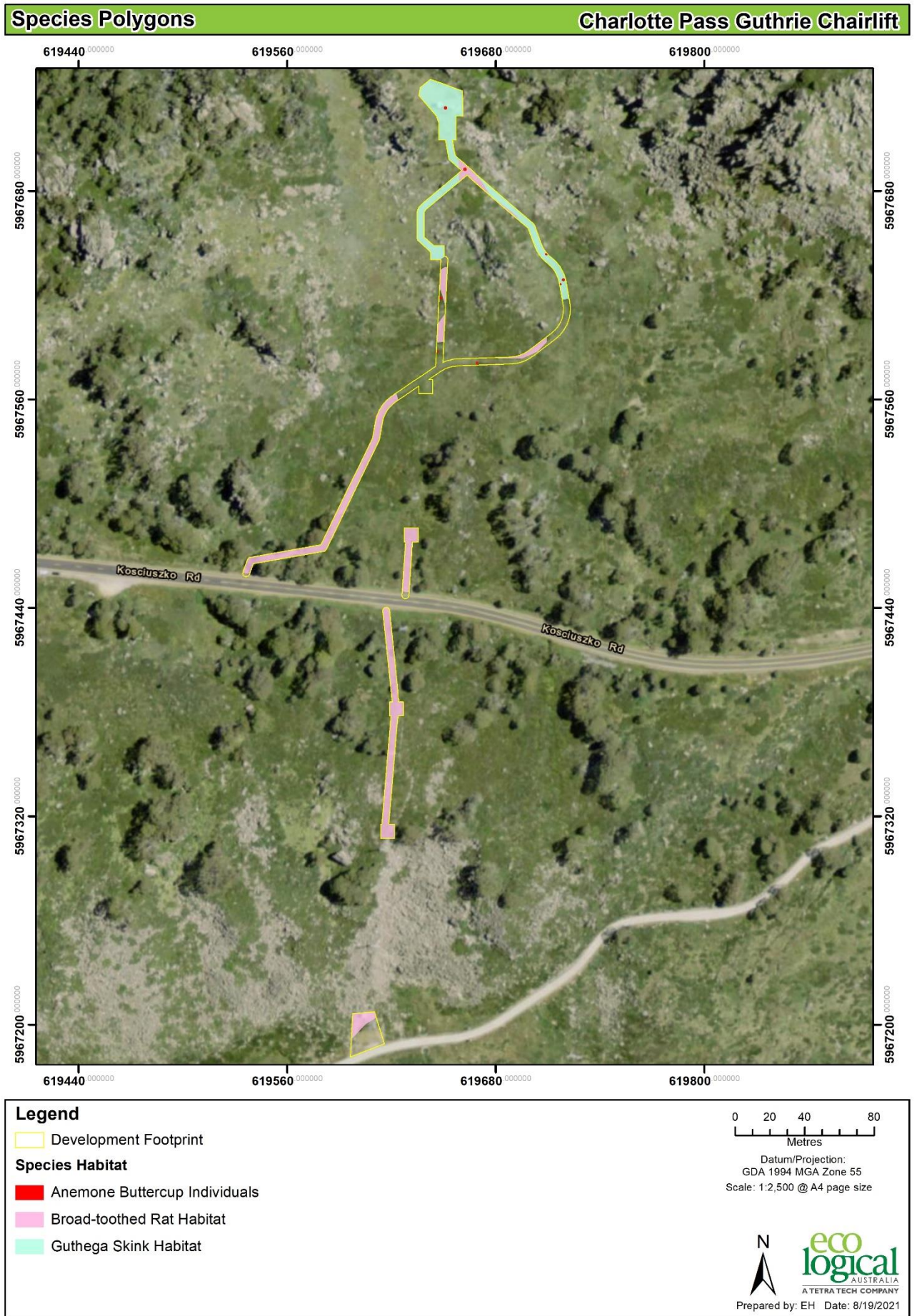


Figure 8: Species polygons

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 chairlift within the alignment of the existing lift and the top and bottom station within the footprint of the existing top and bottom station.
- Minimising the disturbance footprint associated with construction.
- Changing the location of towers, or other features, so that they are located in less sensitive areas, from a biodiversity value perspective. In particular, the bottom station has been located to avoid impacts on Mountain Pygmy-possum habitat and the top station has been located to avoid known Guthega Skink burrows.
- Planning construction access to avoid and minimise impacts on vegetation and fauna habitats, particularly impacts on bog, rock habitats, and known and potential habitat for the Guthega Skink.
- Planning excavator movements to the proposed towers 2 and 3 such that only two passes are required.
- Using low impact construction methods such as over-snow removal of towers.
- Using low impact construction methods such as the use of a helicopter for the concrete pour and tower installation.
- 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.
- Proposing a relatively small capacity lift with a small footprint, particularly the top and bottom stations, relative to some of the options potentially available i.e. a four or six seater lift.

5.1.2. Prescribed biodiversity impacts

The proposal involves the following prescribed biodiversity impacts:

- The proposal is likely to result in the removal or reduction of a small amount of rock outcropping in association with the proposed top and bottom station and some towers.

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 and threatened ecological communities are outlined in **Table 21**.
- threatened species and threatened species habitat is outlined in **Table 22**.
- prescribed biodiversity impacts is outlined in **Section 6.4**.

Note, consistent with the streamlined assessment method, the impacts on native vegetation, within the exception of TECs, have been grouped into the dominant PCT within the development site, PCT 641.

Table 21: Direct impacts to native vegetation

PCT ID	PCT Name	BC Act listing	EPBC Act listing	Direct impact (ha)
641	Alpine grassland/herbfield and open heathlands in Kosciuszko National Park, Australian Alps Bioregion	Not listed	Not Listed	0.33
637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Listed	Listed	0.03

Table 22: 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
<i>Mastacomys fuscus</i>	Broad-toothed Rat	0.17 ha	Vulnerable	Vulnerable
<i>Ranunculus anemoneus</i>	Anemone Buttercup	50	Vulnerable	Vulnerable
<i>Liopholis guthega</i>	Guthega Skink	0.13 ha	Endangered	Endangered

6.2. Change in vegetation integrity

The change in vegetation integrity as a result of the development is outlined in **Table 23**.

Table 23: 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	High	0.03	10	0	-10
4	641	High	0.33	50.4	0	-50.4

6.3. Indirect impacts

The indirect impacts of the development are outlined in **Table 24**. Given the nature of the proposed development, and the proposed mitigation measures, indirect impacts are only anticipated to extend a maximum of 10 m into vegetation surrounding the proposed development site. Indirect impact zones are shown on **Figure 9**.

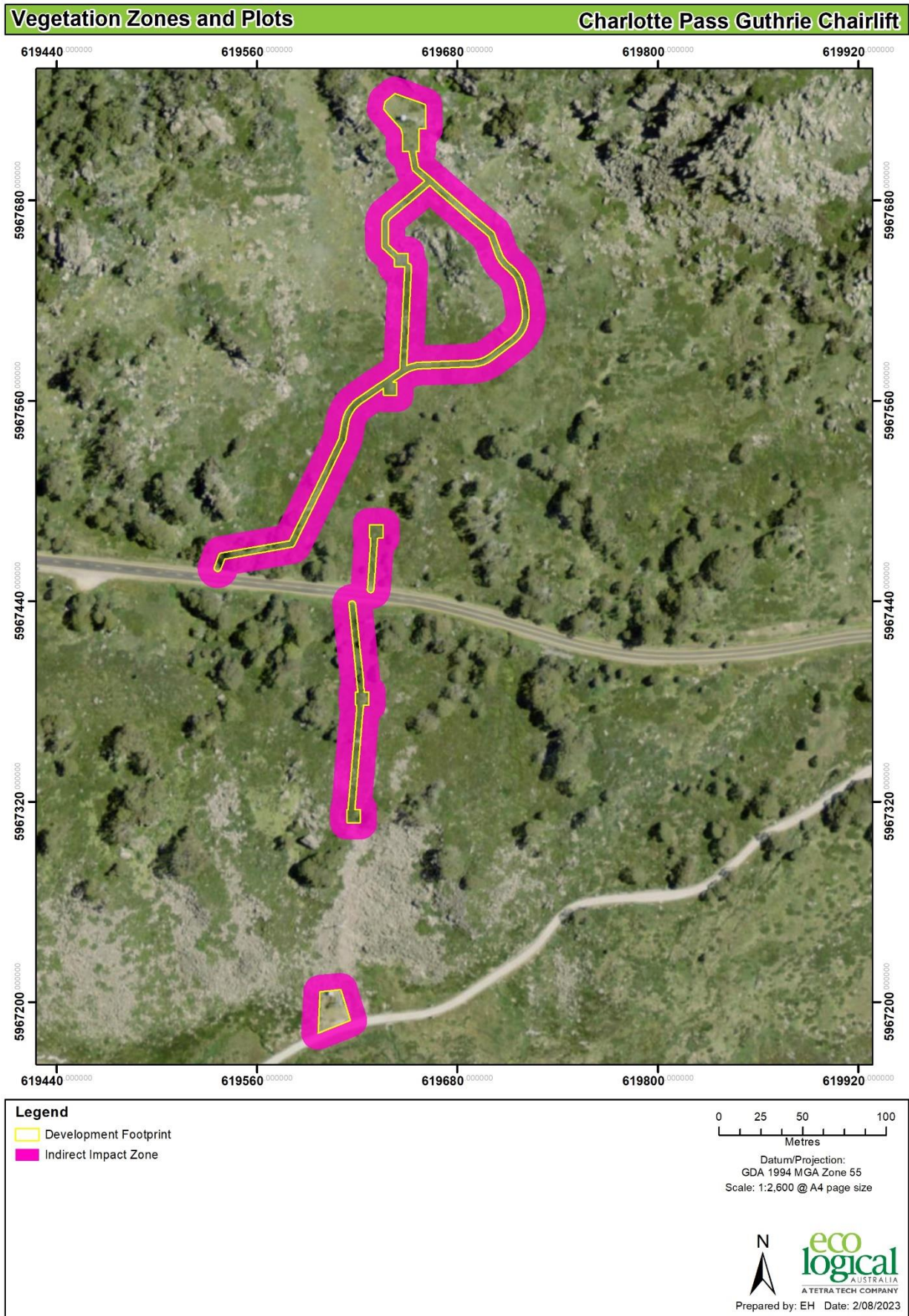


Figure 9: Indirect impact zones

Table 24: 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 months	Intermittently during and post construction phase
Noise, dust or light spill	Construction	Minor during construction.	Minor	Intermittently during construction phase	3 months	Intermittently during construction phase
Inadvertent impacts on adjacent habitat or vegetation	Construction	Minor. The limit of the proposed development site will be marked by flagging tape prior to the commencement of construction. This has been effective at preventing impacts on adjacent vegetation during the many other similar developments that have been undertaken within the alpine resorts in recent years.	Minor	Not expected but possible	3 months	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 modified and which support weeds which are common within the Charlotte Pass 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	3 months	Not expected
Trampling of threatened flora species	Construction	Minor. The only threatened flora species within the development site is the Anemone Buttercup. The impacts of the proposed development on the Anemone Buttercup will be offset.	Minor	Intermittently during construction phase	3 months	Intermittently during construction phase

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	3 months	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	3 months	Intermittently during construction phase
Disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds	Construction and post construction	Minor. Indirect impacts on Guthega Skink habitat during construction particularly around the top station. However, the proposal has been designed to limit potential impacts on Guthega Skink habitat.	Minor	Intermittently during construction phase	3 months	Intermittently during construction phase
Increased skier use and groomer use a potential impacts on subnivean space.	Post construction	Minor. The Guthries area is already skied and groomed regularly and has been for decades. It is unlikely that the new lift will lead to significant amounts of additional usage or grooming in a resort with such relatively low guest usage. No additional substantial adverse impacts are expected.	Minor	During winter post construction phase	Indefinitely	Post construction phase
Impacts on connectivity for the Guthega Skink and Alpine She-oak Skink from the access road upgrade	Construction and post construction	Minor. The upgrade will involve applying gravel on the 4 m wide access road where necessary to facilitate construction access. This will not pose a substantial barrier to these skink species which continue to be common locally despite lots of similar and more substantial developments, as evidenced by the Guthega Skinks presence within tree island of the turning circle at the end of the Kosciuszko Road.	Minor	During and post construction phase	Indefinitely	Post construction phase

6.4. Prescribed biodiversity impacts

The proposal involves the following prescribed biodiversity impacts:

- The proposal is likely to result in the removal or reduction of some rock outcropping in association with the proposed top and bottom station and some towers.

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 25**.

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 excavations for the top and bottom station and tower footings.

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 25: Measures proposed to mitigate and manage impacts

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Displacement of resident fauna	Medium	Low	<p>Prior to construction the development site around the top station, bottom station and towers should be marked with exclusion tape to identify the limit of the development site and proposed works.</p> <p>Exclusion fencing should be erected around the Guthega Skink habitat surrounding the top station to ensure that it is not inadvertently disturbed during construction.</p> <p>The access routes away from the existing access i.e. to towers 2, 3 and 6, should be physically marked with flagging tape or paint to ensure excavator movements keep to the proposed access routes</p>	<p>Fauna within the disturbance footprint should move and thus any injury to fauna species during construction should be avoided.</p> <p>Fauna beyond the development footprint will be protected from inadvertent direct and indirect impacts.</p>	During construction	Blyton Group
Timing works to avoid critical life cycle events such as breeding or nursing	Medium	Low	Excavation and construction works to be completed by April 30 and site stabilisation and rehabilitation measures completed by 31 May.	Works do not continue into the winter.	During construction	Blyton Group
Instigating clearing protocols including pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecologist or licensed wildlife handler during clearing events	Low	Low	Structures should be placed at regular intervals in any excavations that are left open overnight, to enable fauna to exit the hole. Excavations should be inspected in the morning and late afternoon and any animals that have fallen into the hole removed. Similarly, excavations should be checked for animals immediately prior to back-filling.	Injury to fauna species during construction should be avoided.	During construction	Blyton Group
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	Low	Low	Prior to construction the development site around the top station, bottom station and towers should be marked with exclusion	Fauna within the disturbance footprint should move and thus any injury to fauna species	During construction	Blyton Group

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
machinery, is preferable in situations where partial clearing is proposed			<p>tape to identify the limit of the development site and proposed works.</p> <p>Exclusion fencing should be erected around the Guthega Skink habitat surrounding the top station to ensure that it is not inadvertently disturbed during construction.</p> <p>The access routes away from the existing access i.e. to towers 2, 3 and 6, should be physically marked with flagging tape or paint to ensure excavator movements keep to the proposed access routes</p>	<p>during construction should be avoided.</p> <p>Fauna beyond the development footprint will be protected from inadvertent direct and indirect impacts.</p>		
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	Blyton Group
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	Blyton Group
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	Blyton Group
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	Medium	Low	Excavator movements to the proposed towers 2 and 3 are to be planned and executed such that only two passes are required.	NA	NA	NA
Temporary fencing to protect significant environmental features such as riparian zones	Low	Low	Prior to construction the development site around the top station, bottom station and towers should be marked with exclusion	Protection of vegetation and habitats beyond the disturbance footprint.	Prior to and during construction	Blyton Group

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
			<p>tape to identify the limit of the development site and proposed works.</p> <p>Exclusion fencing should be erected around the Guthega Skink habitat surrounding the top station to ensure that it is not inadvertently disturbed during construction.</p> <p>The access routes away from the existing access i.e. to towers 2, 3 and 6, should be physically marked with flagging tape or paint to ensure excavator movements keep to the proposed access routes</p>			
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 <i>Phytophthora cinnamomi</i> .	Risk of weed or pathogen spread substantially reduced.	During and post construction	Blyton Group
Staff training and site briefing to communicate environmental features to be protected and measures to be implemented	Medium	Low	<p>Brief all workers as to limit of the disturbance footprint and other environmental safeguards.</p> <p>All workers to be trained to identify Anemone Buttercup so they can be avoided or translocated.</p>	Risk of disturbance beyond proposed disturbance corridor is reduced.	Prior to and during construction as necessary	Blyton Group
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	<p>Post construction rehabilitation consistent with standard rehabilitation strategies in Kosciuszko National Park.</p> <p>Excavation through areas of native vegetation is to use sod replacement techniques to achieve rapid stabilisation and revegetation.</p>	Post construction vegetation within the development footprint with high medium-term recovery potential.	Post construction	Blyton Group

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
			Any Anemone Buttercup individuals that cannot be avoided by the proposed works should be translocated.			
Monitoring	Medium	Low	Pre and post construction monitoring is to be undertaken of the Guthega skink population surrounding the top station.	Monitoring of the status of the Guthega Skink population.	Annually for at least for one year prior and 5 years post construction	Blyton Group

7. Impact summary

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

7.1. Serious and Irreversible Impacts (SAIL)

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

7.2. Impacts requiring offsets

The impacts of the development requiring offset for native vegetation are outlined in **Table 26** and shown on **Figure 10**. The impacts of the development requiring offset for species credit species and their habitat are outlined in **Table 27** and on **Figure 10**.

Table 26: Impacts to native vegetation that require offsets

Vegetation Zone	PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
2	643	Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion	Alpine Heaths	Alpine Complex	0.08
3	645	Alpine Snow Gum shrubby open woodland at high altitudes in Kosciuszko NP, Australian Alps Bioregion	Subalpine Woodlands	Grassy Woodland	0.07
4	641	Alpine grassland/herbfield and open heathlands in Kosciuszko National Park, Australian Alps Bioregion	Alpine Herbfields	Alpine Complex	0.18

Table 27: 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
<i>Mastacomys fuscus</i>	Broad-toothed Rat	0.17 ha	Vulnerable	Vulnerable
<i>Ranunculus anemoneus</i>	Anemone Buttercup	50	Vulnerable	Vulnerable
<i>Liopholis guthega</i>	Guthega Skink	0.13 ha	Endangered	Endangered

7.3. Impacts not requiring offsets

The impacts of the proposal on PCT 637 (Zone 1) do not require offsets as the BAMC has calculated the VI score of Zone 1 as below the threshold, 15, requiring offsetting. Those impacts that do not require offsets are shown in Figure 11.

7.4. Areas not requiring assessment

No parts of the proposed development do not require assessment.

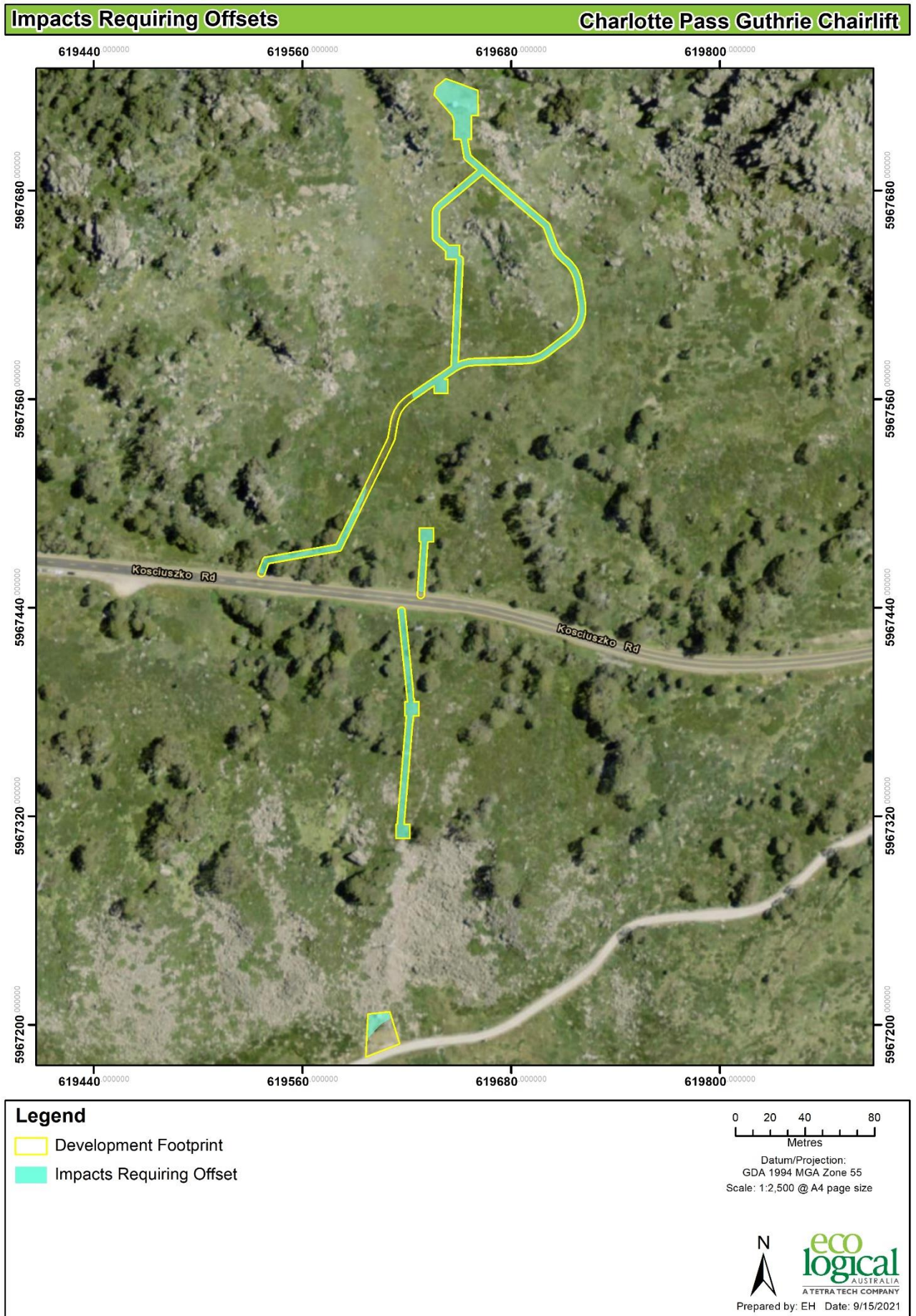


Figure 10: Impacts requiring offset

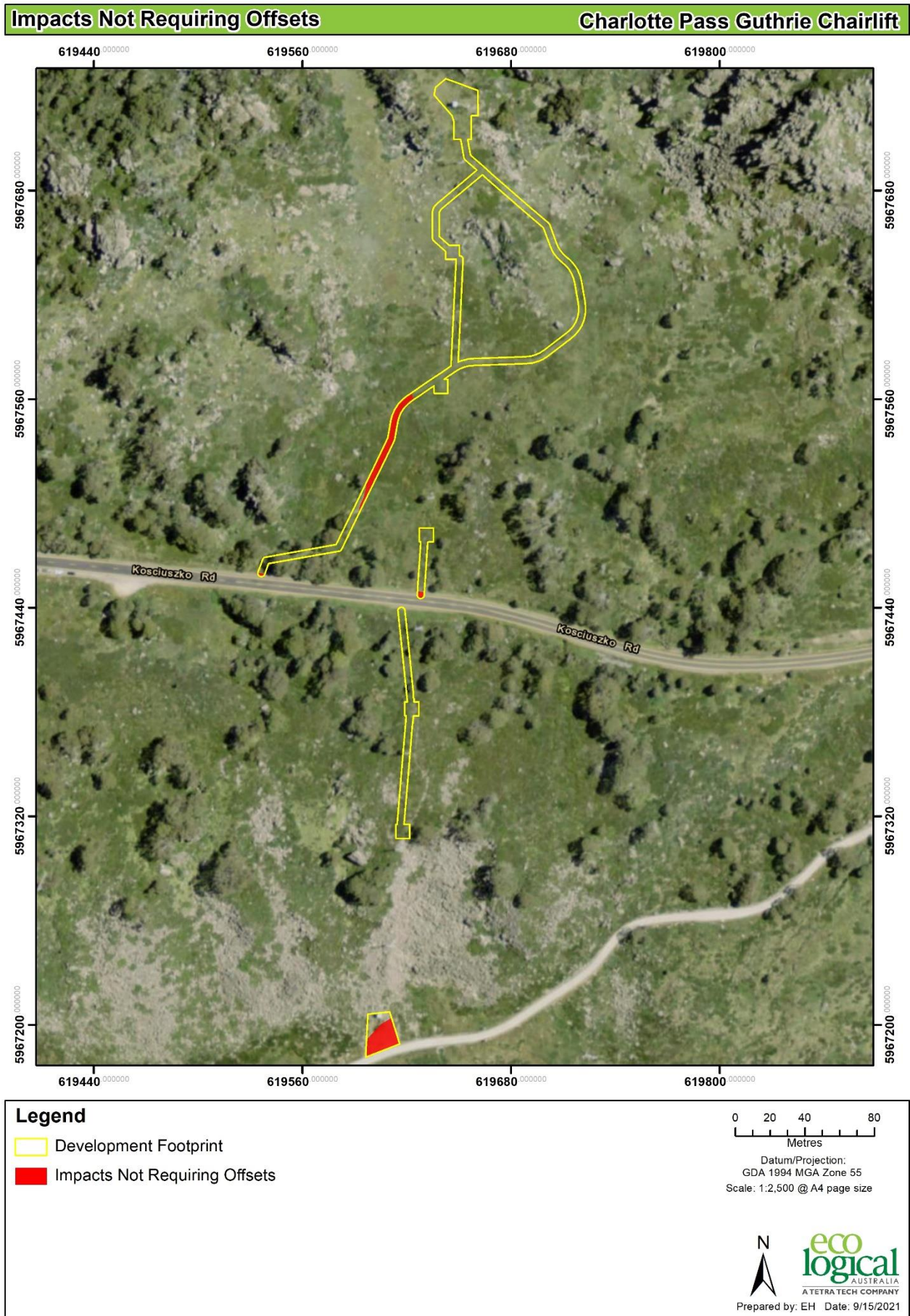


Figure 11: Impacts not requiring offset

7.5. Credit summary

The number of ecosystem credits required for the development are outlined in Table 28. Consistent with the streamlined assessment method, the impacts on native vegetation will be offset by the dominant vegetation community, PCT 641.

The number of species credits required for the development are outlined in **Table 29**.

A biodiversity credit report is included in **Appendix F**.

Table 28: Ecosystem credits required

Vegetation Zone	PCT ID	PCT Name	Credit Class	Direct impact (ha)	Credits required
4	641	Alpine grassland/herbfield and open heathlands in Kosciuszko National Park, Australian Alps Bioregion	Alpine Herbfields	0.33	6

Table 29: Species credit summary

Species	Common Name	Direct impact number of individuals / habitat (ha)	Credits required
<i>Mastacomys fuscus</i>	Broad-toothed Rat	0.17	5
<i>Ranunculus anemoneus</i>	Anemone Buttercup	50	100
<i>Liopholis guthega</i>	Guthega Skink	0.13	3

8. Consistency with legislation and policy

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

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

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

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 25** should be incorporated into the proposal.

10. Conclusion

Eco Logical Australia Pty Ltd was engaged by the Blyton Group Pty Ltd to prepare a BDAR for the proposed construction of a new double seat detachable chairlift and associated works on Mount Guthrie, within the Charlotte Pass 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 six ecosystem credits and 108 species credits are required to offset the unavoidable impacts to the vegetation and fauna habitats present within the development footprint.

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

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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Personal Communications

Zac Atkins. 2015 and 2019. Zac has a PhD in the ecology of the Guthega Skink from La Trobe University.

Appendix A - Definitions

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

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

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

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

Appendix B - Vegetation Floristic Plot Data

Table 30: 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	<i>Acaena novae-zelandiae</i>	Bidgee-widgee	-	-	-	Forb (FG)	g	0.1	2	-	-	-	-	-	-
Polygonaceae	<i>Acetosella vulgaris</i>	Sheep Sorrel	-	Yes	Yes		g	1	2000	-	-	-	g	0.1	5
Ericaceae	<i>Acrothamnus montanus</i>	-	-	-	-	Shrub (SG)	g	0.5	10	-	-	-	-	-	-
Rubiaceae	<i>Asperula gunnii</i>	Mountain Woodruff	-	-	-	Forb (FG)	-	-	-	-	-	-	g	0.1	10
Asteliaceae	<i>Astelia alpina</i> var. <i>novae-hollandiae</i>	-	-	-	-	Forb (FG)	-	-	-	g	0.1	20	-	-	-
Asteliaceae	<i>Astelia psychrocharis</i>	-	-	-	-	Forb (FG)	-	-	-	g	0.2	50	-	-	-
Myrtaceae	<i>Baeckea gunniana</i>	Alpine Baeckea	-	-	-	Shrub (SG)	-	-	-	m	55	500	m	10	50
Myrtaceae	<i>Baeckea utilis</i>	Mountain Baeckea	-	-	-	Shrub (SG)	-	-	-	-	-	-	m	15	5
Asteraceae	<i>Brachyscome</i> sp.	-	-	-	-	Forb (FG)	g	0.3	50	-	-	-	g	2	100
Brassicaceae	<i>Cardamine lilacina</i>	-	-	-	-	Forb (FG)	g	0.1	20	-	-	-	-	-	-
Cyperaceae	<i>Carex breviculmis</i>	-	-	-	-	Grass & grasslike (GG)	g	2	1000	-	-	-	-	-	-
Cyperaceae	<i>Carpha nivicola</i>	-	-	-	-	Grass & grasslike (GG)	-	-	-	g	0.1	100	-	-	-
Asteraceae	<i>Celmisia costiniana</i>	-	-	-	-	Forb (FG)	g	50	2000	g	0.2	50	g	2	500
Caryophyllaceae	<i>Cerastium</i> sp.	-	-	Yes	-		g	0.1	5	-	-	-	-	-	-

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
Asteraceae	<i>Craspedia aurantia</i>	-	-	-	-	Forb (FG)	g	0.2	100	-	-	-	-	-	-
Asteraceae	<i>Craspedia maxgrayi</i>	-	-	-	-	Forb (FG)	g	0.1	20	-	-	-	-	-	-
Restionaceae	<i>Empodisma minus</i>	-	-	-	-	Grass & grasslike (GG)	-	-	-	g	10	2000	g	1	500
Ericaceae	<i>Epacris paludosa</i>	Swamp Heath	-	-	-	Shrub (SG)	-	-	-	m	10	100	m	10	500
Asteraceae	<i>Erigeron bellidioides</i>	-	-	-	-	Forb (FG)	g	0.2	50	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus niphophila</i>	-	-	-	-	Tree (TG)	-	-	-	m	0.1	1	g	0.1	1
Asteraceae	<i>Euchiton</i> sp.	A Cudweed	-	-	-	Forb (FG)	g	1	50	-	-	-	-	-	-
Orobanchaceae	<i>Euphrasia collina</i> subsp. <i>diversicolor</i>	-	-	-	-	Forb (FG)	g	2	1000	-	-	-	-	-	-
Proteaceae	<i>Grevillea australis</i>	Alpine Grevillea	-	-	-	Shrub (SG)	-	-	-	m	0.1	5	-	-	-
Fabaceae (Faboideae)	<i>Hovea montana</i>	-	-	-	-	Shrub (SG)	-	-	-	-	-	-	g	0.2	20
Asteraceae	<i>Hypochaeris radicata</i>	Catsear	-	Yes	-		g	0.5	500	-	-	-	g	0.1	1
Myrtaceae	<i>Kunzea muelleri</i>	-	-	-	-	Shrub (SG)	-	-	-	m	1	20	g	25	100
Lycopodiaceae	<i>Lycopodium fastigiatum</i>	Mountain Clubmoss	-	-	-	Fern (EG)	g	5	1000	g	2	100	g	1	100
Violaceae	<i>Melicytus dentatus</i>	Tree Violet	-	-	-	Shrub (SG)	g	0.1	2	-	-	-	-	-	-
Asteraceae	<i>Microseris lanceolata</i>	Yam Daisy	-	-	-	Forb (FG)	g	0.3	500	-	-	-	-	-	-
Rutaceae	<i>Nematolepis ovatifolia</i>	-	-	-	-	Shrub (SG)	m	0.2	1	m	0.3	10	m	8	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
Asteraceae	<i>Olearia phlogopappa</i>	-	-	-	-	Shrub (SG)	g	0.3	50	m	0.1	20	g	2	100
Apiaceae	<i>Oreomyrrhis eriopoda</i>	Australian Carraway	-	-	-	Forb (FG)	g	1	1000	-	-	-	-	-	-
Proteaceae	<i>Orites lancifolius</i>	Alpine Orites	-	-	-	Shrub (SG)	-	-	-	m	0.2	3	m	5	20
Fabaceae (Faboideae)	<i>Oxylobium ellipticum</i>	Common Shaggy Pea	-	-	-	Shrub (SG)	-	-	-	g	0.1	10	g	5	100
Asteraceae	<i>Ozothamnus cupressoides</i>	-	-	-	-	Shrub (SG)	g	0.2	50	-	-	-	-	-	-
Thymelaeaceae	<i>Pimelea alpina</i>	-	-	-	-	Shrub (SG)	g	0.3	100	-	-	-	g	0.1	20
Thymelaeaceae	<i>Pimelea ligustrina</i> subsp. <i>ciliata</i>	-	-	-	-	Shrub (SG)	-	-	-	-	-	-	m	0.1	10
Plantaginaceae	<i>Plantago euryphylla</i>	-	-	-	-	Forb (FG)	g	0.1	50	-	-	-	-	-	-
Poaceae	<i>Poa costiniana</i>	Bog Snowgrass	-	-	-	Grass & grasslike (GG)	g	40	2000	g	0.2	50	-	-	-
Poaceae	<i>Poa hiemata</i>	Soft Snowgrass	-	-	-	Grass & grasslike (GG)	-	-	-	-	-	-	g	1	100
Podocarpaceae	<i>Podocarpus lawrencei</i>	Mountain Plum Pine	-	-	-	Shrub (SG)	m	0.2	2	-	-	-	m	7	50
Dryopteridaceae	<i>Polystichum proliferum</i>	Mother Shield Fern	-	-	-	Fern (EG)	g	0.1	1	-	-	-	g	0.1	3
Orchidaceae	<i>Prasophyllum</i> sp.	-	-	-	-	Forb (FG)	g	0.1	100	-	-	-	-	-	-
Ranunculaceae	<i>Ranunculus graniticola</i>	Granite Buttercup	-	-	-	Forb (FG)	g	0.2	50	-	-	-	-	-	-
Ranunculaceae	<i>Ranunculus gunnianus</i>	Gunn's Alpine Buttercup	-	-	-	Forb (FG)	g	0.1	1	-	-	-	-	-	-
Ericaceae	<i>Richea continentis</i>	Candle Heath	-	-	-	Shrub (SG)	-	-	-	g	25	500	g	2	50

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	<i>Rytidosperma nudiflorum</i>	-	-	-	-	Grass & grasslike (GG)	g	1	500	-	-	-	-	-	-
Caryophyllaceae	<i>Scleranthus biflorus</i>	Two-flowered Knawel	-	-	-	Forb (FG)	g	1	100	-	-	-	-	-	-
Asteraceae	<i>Senecio gunnii</i>	-	-	-	-	Forb (FG)	-	-	-	-	-	-	g	0.1	5
Sphagnaceae	<i>Sphagnum</i> sp.	-	-	-	-		-	-	-	g	10	1	-	-	-
Stylidiaceae	<i>Stylidium graminifolium</i>	Grass Triggerplant	-	-	-	Forb (FG)	-	-	-	g	0.1	100	-	-	-
Winteraceae	<i>Tasmannia xerophila</i> subsp. <i>xerophila</i>	Alpine Pepperbush	-	-	-	Shrub (SG)	-	-	-	-	-	-	m	0.1	1
Poaceae	<i>Trisetum spicatum</i>	Bristle Grass	-	-	-	Grass & grasslike (GG)	g	0.1	100	-	-	-	g	0.1	5

Appendix C - Vegetation Integrity Plot Data

Table 31: Plot location data

Plot no.	PCT	Condition	Easting	Northing	Bearing
1	641	High	619643	5967663	270
2	637	High	619627	5967541	180
3	643	High	619623	5967318	90

Table 32: Vegetation integrity data (composition)

Composition (number of species)						
Plot	Tree	Shrub	Grass	Forb	Fern	Other
1	0	7	4	16	2	0
2	1	9	3	4	1	0
3	1	14	3	4	2	0

Table 33: Vegetation integrity data (Structure)

Structure (Total cover)						
Plot	Tree	Shrub	Grass	Forb	Fern	Other
1	0.0	1.8	43.1	56.8	5.1	0.0
2	0.1	91.8	10.3	0.6	2.0	0.0
3	0.1	89.5	2.1	4.2	1.1	0.0

Table 34: Vegetation integrity data (Function)

Function											
Plot	Large Trees	Hollow trees	Litter Cover	Length Fallen Logs	Tree Stem 5-9	Tree Stem 10-19	Tree Stem 20-29	Tree Stem 30-49	Tree Stem 50-79	Tree Regen	High Threat Weed Cover
1	0	0	6.6	0	0	0	0	0	0	0	1.0
2	0	0	77	0	1	0	0	0	0	0	0.0
3	0	0	54	0	0	0	1	0	0	1	0.1

Appendix D - EPBC Act Significant Impact Criteria

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

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

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

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

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

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;	<p>Yes. The study area does provide potential and known habitat for the following Commonwealth listed endangered species: Alpine She-oak Skink and Guthega Skink.</p> <p>The significant impact criteria for endangered species are discussed below:</p> <p>a. lead to a long-term decrease in the size a population of a species,</p> <p>The impacts associated with the proposed action will affect only a very small area of potential habitat for the Alpine She-oak Skink in the context of that available to the species in the locality. It is considered highly unlikely that the proposed works would result in injury or death of any Alpine She-oak Skinks as the disturbances associated with the proposed works are likely to temporarily deter any individuals from the locations where works are being undertaken.</p> <p>Under these circumstances, it is considered highly unlikely that the proposed action will lead to a long-term decrease in the size of the Alpine She-oak Skink population.</p> <p>The Guthega Skink is known from many locations on the ridge between Mount Stillwell and Mount Guthrie, including habitats surrounding the top station, the existing access track and two of the proposed tower locations. The species is relatively common in suitable habitats between Mount Stillwell and Mount Guthrie.</p> <p>Whilst the proposal will result in temporary disturbances to foraging habitats during the construction phase of the proposal, it will not affect any known burrow systems. Excavations such as those that will be required for the towers and top station footings, and other major disturbances associated with the proposal will be at least 4 m from the nearest known Guthega Skink burrow (near the top station) and generally considerably more. The burrows are not thought to extend more than a 2-3 m (Atkins pers. comm. 2019). So it is unlikely that the excavation associated with the proposal will encroach upon any of the species burrows.</p> <p>Whilst the proposal will involve disturbances in known Guthega Skink habitat, the extensive surveys undertaken for this assessment have demonstrated that the proposal is unlikely to involve any direct impacts on the species burrow networks and is expected to only involve temporary impacts on a small area of the species foraging habitat.</p> <p>The species remains locally common around the top station where there has been considerable historic disturbance. It is also regularly observed in other locations at Charlotte Pass in places that have been historically heavily disturbed. In particular, the species is very common around the end of Kosciuszko Road, which has been subject to major historic disturbances and which, as the trail head for the main range walking track, has high daily traffic during the summer months.</p> <p>The proposed action is not expected to directly affect any known burrows and will only affect a small amount of foraging habitat and so no significant impacts are expected that would lead to a long-term decline of the Guthega Skink population. Given this, it is considered unlikely that there will be impacts on this species that will lead to a long-term decrease in the size of the Guthega Skink population.</p> <p>b. reduce the area of occupancy of the species</p> <p>The proposed action will be limited to the removal or temporary disturbance of only approximately 0.17 ha of known Guthega Skink habitat and 0.36 ha of potential habitat for the Alpine She-oak Skink. In the context of the extent of these resources in the locality the proposal is unlikely to 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.</p> <p>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.</p> <p>c. fragment an existing population into two or more populations</p>

Matters to be considered	Impact
	<p>The proposed action will be limited to the removal or disturbance of a small amount of potential habitat for the Guthega Skink and Alpine She-oak Skink in the context of the extent of these resources in the locality and is unlikely to affect their ability to access habitats within or beyond the development site post construction.</p> <p>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.</p> <p>d. adversely affect habitat critical to the survival of a species</p> <p>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.</p> <p>e. disrupt the breeding cycle of a population</p> <p>The Guthega Skink is thought to mate in spring or early summer and young are born in mid to late summer. The generation length, or average age of parents of the current cohort, is thought to be 3-7 years. The proposal will not result in the loss of any key habitats for the species such as known burrow systems. Guthega Skinks are thought to have considerable site fidelity, so are likely to generally remain within 50 m of their burrow system. Given the distance to known burrow systems, the species fidelity with these systems, and the assumed reluctance of individuals to approach areas where machines and people are working during the construction phase, it is considered unlikely that any individuals of the species will be killed during the construction phase. As such, it is considered unlikely that the proposal will disrupt breeding in the colonies which surround parts of the development site.</p> <p>Under these circumstances, it is considered unlikely that the proposed action will disrupt the breeding cycle of the Guthega Skink population which occurs on Mount Guthrie.</p> <p>It is considered unlikely that the proposal would disrupt the breeding cycle of any population of the Alpine She-oak Skink that may occur in the Mount Guthrie area as the proposal will affect only a small area of marginal potential habitat for the species and includes post-construction rehabilitation actions which mitigate against the potential for the disturbed areas to present a barrier to the movement of Alpine She-oak Skink individuals.</p> <p>f. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline</p> <p>The proposed action will modify a very small area of potential habitat for the Alpine She-oak Skink or Guthega Skink in the context of the extent of potential habitat surrounding the development site and on Mount Guthrie and in the locality.</p> <p>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.</p> <p>g. result in invasive species that are harmful to an endangered species becoming established in the endangered or critically endangered species' habitat</p> <p>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. Both species continue to occur within the Charlotte Pass Ski Resort area and other places within the Australian Alps where a range of invasive species have long been established. The proposed action includes protocols to restrict the potential for introductions of invasive species.</p> <p>h. introduce disease that may cause the species to decline.</p> <p>The proposed action is unlikely to introduce disease that may cause the Alpine She-oak Skink or Guthega Skink to decline. There are currently no identified reptile diseases that could be exacerbated by the proposed actions.</p> <p>i. interfere substantially with the recovery of the species.</p> <p>As the proposed action is not considered to decrease or fragment any existing populations, the recovery of the Alpine She-oak Skink or Guthega Skink is unlikely to be adversely impacted.</p>

Matters to be considered	Impact
Any impact on Commonwealth Listed Vulnerable Species;	<p>Yes. The study area provides known habitat for two Commonwealth listed vulnerable species: the Broad-toothed Rat and the Anemone Buttercup.</p> <p>The significant impact criteria in terms of the vulnerable species are discussed below:</p> <p>a. lead to a long-term decrease in the size of an important population of a species.</p> <p>Whilst the proposed action will affect some known Broad-toothed Rat habitat, it will affect only a very small amount of potential habitat for the species. 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 from entering the work area. As such, it is unlikely that any individuals would be killed during the implementation of the proposed action.</p> <p>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.</p> <p>The Anemone Buttercup has recovered well from the brink of extinction since the cessation of grazing in the NSW alpine areas, and is now locally common throughout the main range. The local population of the species is likely to comprise many thousands of plants, as hundreds of plants have been recorded from contiguous habitats. The species is common on Mount Guthrie and elsewhere throughout the Charlotte Pass Ski Resort area.</p> <p>Under these circumstances, the loss of up to 50 Anemone Buttercup plants in association with the proposed action will not lead to a long-term decrease in the size of an important population of the species.</p> <p>b. reduce the area of occupancy of an important population</p> <p>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, as evidenced by its characteristic scats, in the Charlotte Pass Ski Resort Area where there have been 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.</p> <p>The proposed action will reduce the area of occupancy of the Anemone Buttercup by a very small amount, approximately 5 m².</p> <p>c. fragment an existing important population into two or more populations</p> <p>The proposed action will not fragment an existing important population of either the Broad-toothed Rat or the Anemone Buttercup into two or more populations. Both species populations extend beyond the development site and the Charlotte Pass Ski Resort Area.</p> <p>d. adversely affect habitat critical to the survival of a species</p> <p>No habitat within the development site is considered to be critical to the survival of the Broad-toothed Rat or the Anemone Buttercup.</p> <p>e. disrupt the breeding cycle of an important population</p> <p>The proposed action and affected are too small to disrupt the breeding cycle of a population of the Broad-toothed Rat.</p> <p>f. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that either species is likely to decline</p> <p>The proposed action will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the Broad-toothed Rat or the Anemone Buttercup is likely to decline.</p> <p>g. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat</p> <p>The proposed action will not result in invasive species that are harmful becoming established in habitat for the Broad-toothed Rat or the Anemone Buttercup. Both species continue to occur within the Charlotte Pass Ski Resort area and other places within the Australian Alps where a range of invasive species have long been established. The proposed action includes protocols to restrict the potential for introductions of invasive species.</p> <p>h. introduce disease that may cause the species to decline.</p>

Matters to be considered	Impact
	<p>The proposed action is unlikely to introduce disease that may cause the Broad-toothed Rat or the Anemone Buttercup to decline.</p> <p>i. interferes substantially with the recovery of the species.</p> <p>Whilst there have been documented declines in some Broad-toothed Rat populations within the Snowy Mountains, these declines have been attributed to factors such as major bushfire events and early snow thaws, and not impacts of the nature of those proposed. The local population of the Broad-toothed Rat appears to continue to be relatively large on the basis of the abundance of the species' scats throughout the Charlotte Pass Ski Resort Area 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.</p> <p>The Anemone Buttercup has recovered well from the brink of extinction since the cessation of grazing in the NSW alpine areas, and is now locally common throughout the main range. The local population of the species is likely to comprise many thousands of plants. The species is common on Mount Guthrie and elsewhere throughout the Charlotte Pass Ski Resort area.</p>
Any impact on a Commonwealth Endangered Ecological Community	<p>Yes: The Alpine Sphagnum Bogs and Associated Fens endangered ecological community occurs within the development site.</p> <p>The significant impact criteria in terms of endangered ecological communities are discussed below:</p> <p>a. reduce the extent of an ecological community</p> <p>The proposal is expected to result in the loss or modification of approximately 300 m² of Alpine Sphagnum Bogs and Associated Fens EEC where construction access above Kosciuszko Road will use the existing access track and affect already disturbed sections of the community. The local occurrence of the community is extensive with many patches of the community within the Charlotte Pass Ski Resort and a very large occurrence of the community in association with Spencers Creek and Johnnies Plain.</p> <p>b. fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines;</p> <p>The proposal will not fragment the Alpine Sphagnum Bogs and Associated Fens EEC as the proposed impacts will follow the alignment of an existing access track through the community.</p> <p>c. adversely affect habitat critical to the survival of an ecological community</p> <p>The local occurrence of the Alpine Sphagnum Bogs and Associated Fens EEC is very extensive. In this context, the habitat for the community within the development site is not considered to be critical to its survival.</p> <p>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</p> <p>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. The proposal has been designed to mitigate against any potential impacts on surface or subsurface hydrology.</p> <p>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.</p> <p>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. 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.</p> <p>f. cause a substantial reduction in the quality or integrity of an ecological community, including, but not limited to:</p>

Matters to be considered	Impact
	<p>-assisting invasive species, that area harmful to the listed ecological community, to become established, or</p> <p>-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</p> <p>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.</p> <p>g. interfere with the recovery of an ecological community</p> <p>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, given that almost its entire distribution is within conservation reserves. It has also recovered well since the 2003 wildfires.</p> <p>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.</p>
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 many surveys using BBAM, BAM and DPIE Vegetation Survey Standard or very similar methodologies. Ryan project managed ELAs contributions to the Full-floristic Vegetation Survey and Condition Assessment for the South-east Highlands and Australian Alps of the Upper Murrumbidgee Catchment and South-east Corner Biometric Benchmark projects which involved the collection of more than 250 plots.

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

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

RELEVANT PROJECT EXPERIENCE

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

Appendix F - Biodiversity credit report

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00027296/BAAS17061/21/00027317	Guthries Chairlift	16/06/2022
Assessor Name	Assessor Number	BAM Data version *
Ryan Smithers	BAAS17061	54
Proponent Name(s)	Report Created	BAM Case Status
	29/08/2022	Finalised
Assessment Revision	Assessment Type	Date Finalised
1	Part 4 Developments (Small Area)	29/08/2022
BOS entry trigger	* 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.	
BOS Threshold: Biodiversity Values Map		

Potential Serious and Irreversible Impacts

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

Additional Information for Approval

PCT Outside Ibra Added
None added

PCTs With Customized Benchmarks

BAM Biodiversity Credit Report (Variations)

PCT

No Changes

Predicted Threatened Species Not On Site

Name

Pachycephala olivacea / Olive Whistler

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
641-Alpine grassland/herbfield and open heathlands in Kosciuszko National Park, Australian Alps Bioregion	Not a TEC	0.3	0	6	6.00
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	0	0.00

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

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region

BAM Biodiversity Credit Report (Variations)

	<p>Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions</p> <p>This includes PCT's: 518, 607, 637, 665, 681, 766, 788, 939, 1188, 1200, 1256, 1270, 1287, 1298, 1743, 1744, 1745</p>	-	637_High	No	0	<p>Snowy Mountains, Bendo, Monaro, Murrumbateman, Snowy Mountains and South East Coastal Ranges.</p> <p>or</p> <p>Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.</p>
Variation options						
	Formation	Trading group	Zone	HBT	Credits	IBRA region
	Alpine Complex	Tier 3 or higher threat status	637_High	No	0	<p>IBRA Region: Australian Alps,</p> <p>or</p> <p>Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.</p>
641-Alpine grassland/herbfield and open heathlands in Kosciuszko National Park, Australian Alps Bioregion						
Like-for-like credit retirement options						
	Class	Trading group	Zone	HBT	Credits	IBRA region
	<p>Alpine Herbfields</p> <p>This includes PCT's: 641, 642</p>	Alpine Herbfields <50%	641_High	No	6	<p>Snowy Mountains, Bendo, Monaro, Murrumbateman, Snowy Mountains and South East Coastal Ranges.</p> <p>or</p> <p>Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.</p>

BAM Biodiversity Credit Report (Variations)

641-Alpine grassland/herbfield and open heathlands in Kosciuszko National Park, Australian Alps Bioregion	Variation options					
	Formation	Trading group	Zone	HBT	Credits	IBRA region
	Alpine Complex	Tier 4 or higher threat status	641_High	No	6	IBRA Region: Australian Alps, 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
Liopholis guthega / Guthega Skink	641_High	0.1	3.00
Mastacomys fuscus / Broad-toothed Rat	641_High, 637_High	0.2	5.00
Ranunculus anemoneus / Anemone Buttercup	641_High	50.0	100.00

Credit Retirement Options Like-for-like options

Liopholis guthega / Guthega Skink	Spp		IBRA region
	Liopholis guthega /Guthega Skink		Any in NSW
	Variation options		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region

BAM Biodiversity Credit Report (Variations)

	Fauna	Endangered	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.
Mastacomys fuscus/ Broad-toothed Rat	Spp		IBRA region
	Mastacomys fuscus /Broad-toothed Rat		Any in NSW
	Variation options		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Fauna	Vulnerable	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.
Ranunculus anemoneus/ Anemone Buttercup	Spp		IBRA region
	Ranunculus anemoneus /Anemone Buttercup		Any in NSW
	Variation options		
	Kingdom	Any species with same or higher category of listing	IBRA region

BAM Biodiversity Credit Report (Variations)

		under Part 4 of the BC Act shown below	
	Flora	Vulnerable	Snowy Mountains, Bongo, 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.

