Department of Planning
and Environment

Issued under the Environmental Planning and Assessment Act 1979

Approved Application No DA 22/4928

Granted on the 24 March 2023

Signed M Brown

Sheet No 3 of 8

Mt Selwyn mobile network station: Biodiversity assessment

Final Report

Prepared for Commplan

22 October 2021

Biosis offices

NEW SOUTH WALES

Albury
Phone: (02) 6069 9200
Email: albury@biosis.com.au

Newcastle
Phone: (02) 4911 4040
Email: newcastle@biosis.com.au

Sydney
Phone: (02) 9101 8700
Email: sydney@biosis.com.au

Wollongong
Phone: (02) 4201 1090
Email: wollongong@biosis.com.au

VICTORIA

Ballarat
Phone: (03) 5304 4250
Email: ballarat@biosis.com.au

Melbourne
Phone: (03) 8686 4800
Email: melbourne@biosis.com.au

Wangaratta
Phone: (03) 5718 6900
Email: wangaratta@biosis.com.au

Document information

Report to:	Commplan
Prepared by:	Averill Wilson Matthew Hyde
Biosis project no.:	29165
File name:	29165.Mt-Selwyn.FFA.FIN02.20211022

Citation: Biosis 2021. Mt Selwyn mobile network station: Biodiversity assessment. Report for Commplan. Authors: Wilson A. and Hyde M., Biosis Pty Ltd, Sydney. Matter no. 29165.

Document control

Version	Internal reviewer	Date issued
Draft version 01	Callan Wharfe	18/01/2019
Final version 01	Callan Wharfe	23/01/2019
Final version 02	Luke Stone	21/10/2021

Acknowledgements

Biosis acknowledges the contribution of the following people and organisations in undertaking this study:

- Commplan: Emma Lachlan, Mark Byrnes and Colin Ward.
- Department of the Environment and Energy for access to the Protected Matters Search Tool of the Australian Government.
- NSW Office of Environment and Heritage for access to the BioNet Atlas of NSW Wildlife.

Biosis staff involved in this project were:

- Callan Wharfe (field work).
- Lucy Wilson and Astrid Mackegard (mapping).

Contents

Tables

Figures

Summary

Biosis Pty Ltd was commissioned by Commplan to undertake a flora and fauna assessment to assess impacts associated with the installation of a new telecommunications tower. The study area is located approximately 1 kilometre east of the base of Mt Selwyn snow resort and approximately 95 kilometres south-west of the Canberra CBD (Figure 1). The proposed works include tower construction, a 10 metre associated asset protection zone (APZ), access track for construction and ongoing maintenance work, and trenching for the installation of power lines for operation of the tower (Figure 2).

The study area, defined by the extent of proposed works (impact area) and adjacent areas likely to be directly or indirectly affected by the proposal consists of a 0.29 hectare patch of vegetated land south of the Selwyn Trail approximately 100 metres south-east of the junction with the Selwyn Cross Country Ski trail. The study area is located 50 metres from an existing telecommunications tower. Within the study area, the proposed works require the removal of 71 square metres of vegetation for installation of the tower and modification of a further 0.07 hectares of vegetation (including selective trimming, fuel load reduction and understorey removal) for the installation of the APZ, access trail and trenching for power lines. Outside of the study area the works will require access and trenching for power lines along the previously disturbed Mt Selwyn Trail and access pathways. The current assessment investigates the direct impacts within the project's impact area as well as any additional areas in the broader study area which are likely to be indirectly affected by the proposal.

This flora and fauna assessment has been prepared to inform the development application (DA) by determining whether ecological values within the study area are consistent with or provide habitat for any threatened species, populations or ecological communities (biota) listed under the *Environmental Protection and Biodiversity Conservation Act* 1999 (EPBC Act) or the *Biodiversity Conservation Act 2016* (BC Act). In addition this report has been prepared to outline the ecological recommendations to avoid, mitigate and offset impacts.

Ecological values

Key ecological values associated with the proposed works include:

- Removal of 71 square metres of PCT643 Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion for installation of the proposed telecommunications tower.
- Selective vegetation removal of 0.05 ha of PCT643 Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion and 0.02 ha PCT1196 Snow Gum - Mountain Gum shrubby open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion for installation of the APZ, access path and trenching for power lines.
- Removal and/or modification to 0.08 hectares of potential habitat for threatened fauna species including:
  - Alpine She-oak Skink *Cyclodomorphus praealtus* (Endangered, BC Act and EPBC Act).
  - Dusky Woodswallow *Artamus cyanopterus cyanopterus* (Vulnerable, BC Act).
  - Mountain Pygmy-possum *Burramys parvus* (Endangered, BC Act and EPBC Act).

- Eastern Pygmy-possum *Cercartetus nanus* (Vulnerable, BC Act).
- Broad-toothed Rat *Mastacomys fuscus* (Vulnerable, BC Act and EPBC Act).
- Smoky Mouse *Pseudomys fumeus* (Critically Endangered, BC Act and Endangered, EPBC Act).

Recommendations

The primary measures for the development to minimise impacts to ecological values on the site are:

- Pre-clearance surveys undertaken by a suitably qualified ecologist prior to removal of vegetation to discount the presence of threatened species and prevent direct impacts.
- Limit removal of native vegetation to the extent necessary to complete the works.
- Selectively trim the impact area for the APZ to minimise impact to trees and areas of higher ecological value.
- Align access trail and power line trenching to limit impact on vegetation to understorey species.
- Collect, stockpile and redistribute woody debris in adjoining bushland.
- Implement erosion control to minimise indirect impact to adjoining bushland.

Government legislation and policy

An assessment of the project against key biodiversity legislation and policy is provided and summarised below.

Legislation / Policy	Relevant ecological feature	Permit / approval required
Environment Protection and Biodiversity Conservation Act 1999	No EPBC Act listed Threatened Ecological Communities (TEC) occur within the study area. 0.29 ha of threatened species habitat is located within the study area. The study area is located within the Kosciuszko National Park which is listed as a national heritage place within the Australian Alps National Parks and Reserves.	Significant Impact Criteria (SIC) assessments for • Alpine She-oak Skink • Mountain Pygmy-possum • Broad-toothed Rat • Smoky Mouse Refer to Appendix 3 for SIC assessments for these species. The SIC assessments found that a significant impact was not likely and therefore a referral to the Commonwealth is not required. Consideration of clearing within the Australian Alps National Parks and Reserves natural heritage place.

Legislation / Policy	Relevant ecological feature	Permit / approval required
Biodiversity Conservation Act 2016	No BC Act listed TECs occur within the study area. The study area contains habitat for six threatened fauna species: • Alpine She-oak Skink • Dusky Woodswallow • Mountain Pygmy-possum • Eastern Pygmy-possum • Broad-toothed Rat • Smoky Mouse	Tests of Significance for the following species: • Alpine She-oak Skink • Dusky Woodswallow • Mountain Pygmy-possum • Eastern Pygmy-possum • Broad-toothed Rat • Smoky Mouse Refer to Appendix 4 for Tests of Significance (ToS) for these species. The ToS found that a significant impact was not likely and therefore a Species Impact Statement or Biodiversity Development Assessment Report is not required to be undertaken.
Environmental Planning & Assessment Act 1979	Threatened species or their habitat occur within the study area.	Impacts to the threatened species present or likely to occur must be assessed through undertaking a ToS.
State Environmental Planning Policy (Infrastructure) 2007	Telecommunication and other communication facilities are covered under this State Environmental Planning Policy (SEPP) and are able to be carried out with consent on any land pursuant to Clause 115 of the Act - *Development for the purposes of telecommunications facilities, other than development in clause 114 or development that is exempt development under clause 20 or 116, may be carried out by any person with consent on any land.*	The proposed works are permitted with consent.
State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007	The study area falls with then Mt Selwyn Alpine Resort area.	Within the land use table under Mt Selwyn Alpine Resort the proposed works are permitted with consent.
National Parks and Wildlife Act 1974	The project requires the removal vegetation within the Kosciuszko National Park.	The works falls under the SEPP (Infrastructure) which allows telecommunications facilities to be installed on all lands with consent, and therefore subject to approval the works will be permitted to be undertaken in the national park. As per the SEPP (Infrastructure) communication with the OEH will be required prior to commencing works.

Note: Guidance provided in this report does not constitute legal advice.

1 Introduction

1.1 Project background

Biosis Pty Ltd was commissioned by Commplan to undertake a biodiversity assessment of the impact area and broader study area associated with the proposed works (Figure 1). The proposed works consists of the installation of a new telecommunications tower with a 10 metre associated asset protection zone (APZ). The works will require installation of an access track perpendicular from the current Mt Selwyn trail for access during the construction phase of the works and for ongoing maintenance (Figure 2). A trench will be required to install a 50 mm power line which will extend from the north east corner of the existing telecommunications tower and will follow previously disturbed vegetation, within the current access pathway for the existing telecommunications tower and Mt Selwyn Trail, and enter the study area aligned with the access trail installed from Mt Selwyn Trail to the proposed telecommunications tower (Figure 2).

The study area, defined by the extent of proposed works (impact area) and adjacent areas likely to be directly or indirectly affected by the proposal consists of a 0.29 hectare patch of vegetated land south of the Selwyn Trail approximately 100 metres south-east of the junction with the Selwyn Cross Country Ski trail. The study area is located 50 metres from another previously installed telecommunications tower. Within the study area the proposed works (impact area) requires the removal of 71 square metres of vegetation for installation of the tower and modification of 0.07 hectares of native vegetation, including selective trimming, fuel load reduction and understorey removal, for the installation of the APZ, access trail and trenching. The modification of vegetation will be undertaken to remove minimal canopy species where possible to facilitate the APZ and access trail. The trenching will be limiting to only understorey species, primarily grasses, with the selection of alignment to be decided based on the smallest impacts to vegetation and habitat.

1.2 Scope of assessment

The objectives of this investigation are to:

- Describe the vascular flora (ferns, conifers, and flowering plants), vertebrate fauna (birds, mammals, reptiles, frogs).
- Map native vegetation and other habitat features.
- Review the implications of relevant biodiversity legislation and policy.
- Identify potential implications of the proposed development and provide recommendations.
- Recommend any further assessments of the site that may be required (such as targeted searches for threatened biota).

1.3 Location of the study area

The study area is located approximately 1 kilometres east of the base of Mt Selwyn snow resort and approximately 95 kilometres south-west of the Canberra Central Business District (Figure 1). It encompasses 0.29 hectares of public land. It is currently zoned E1 – National Parks and Nature Reserves.

The study area is located within the:

- Australian Alps Interim Biogeographic Regionalisation for Australia Bioregion and Snowy Mountains subregion.
- Snowy River drainage basin (catchment).
- South East Local Land Services (LLS) Management Area.
- Snowy Valleys Local Government Area (LGA).
- Kosciuszko National Park.

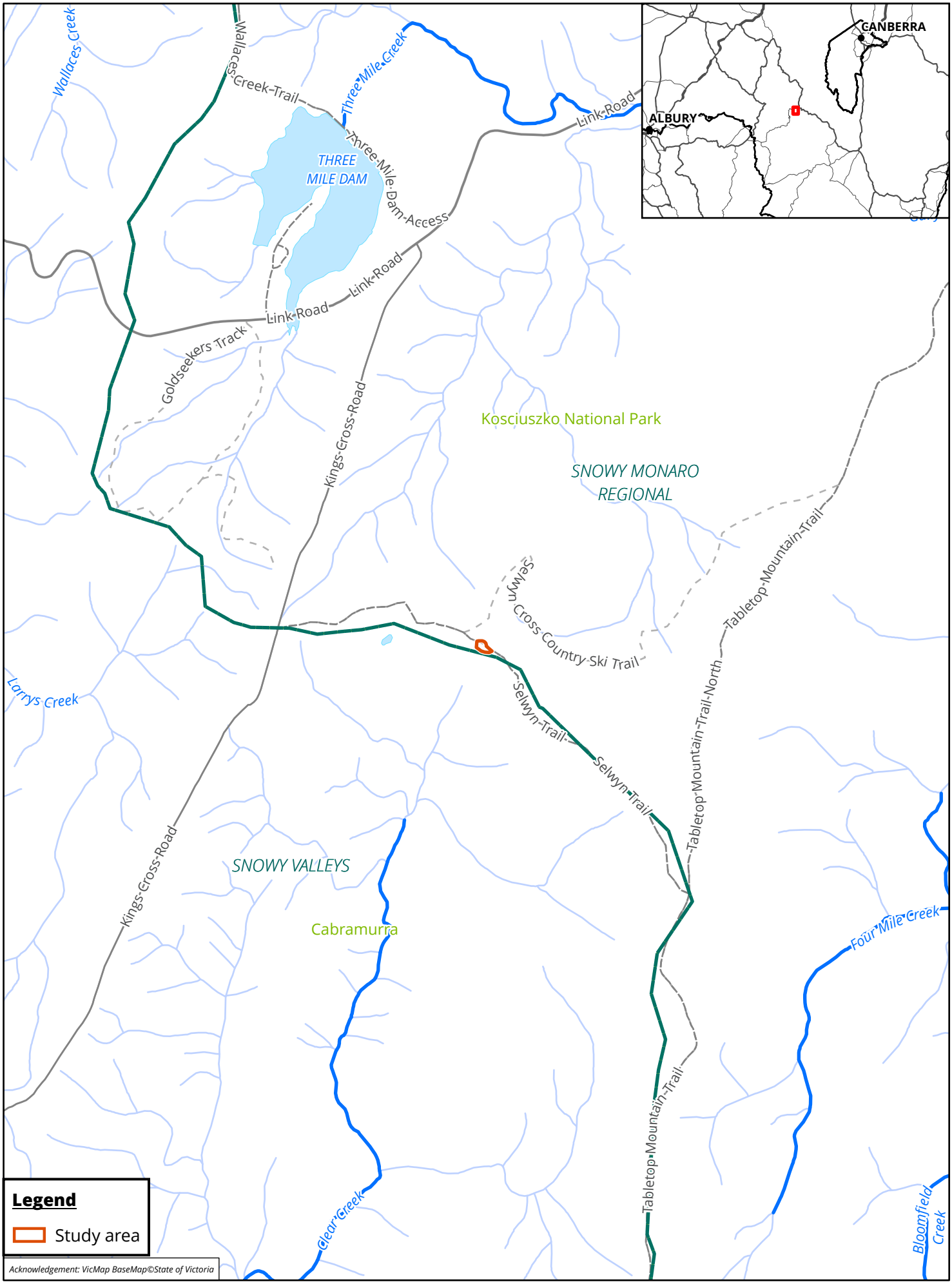


Figure 1 Location of the study area

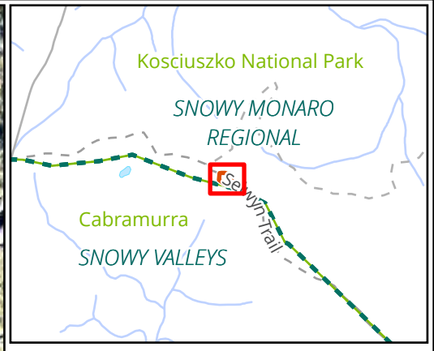
biosis

Matter: 35826,
Date: 29 September 2021 ,
Prepared for: MH, Prepared by: AM, Last edited by: amackegard
Layout: 35826_F1_Locality
Project: P:\35800s\35826\Mapping\35826_MtSelwyn.aprx

0 200 400 600 800 1,000
Metres
Scale: 1:25,000 @ A4
Coordinate System GDA 1994 MGA Zone 55

N

00



Legend

- Study area
- Trench for power line
- Proposed access track
- Asset protection zone
- Tower

Figure 2 Proposed works

0 4 8 12 16 20

Metres

Scale: 1:500 @ A3

Coordinate System: GDA 1994 MGA Zone 55

N

biosis

Matter: 35826,
Date: 20 October 2021 ,
Prepared for: MH, Prepared by: AM, Last edited by: amackegard
Layout: 35826_F2_Extent
Project: P:\35800s\35826\Mapping\
35826_MtSelwyn.aprx

Acknowledgements: Basemap © Land and Property Information 2016, Imagery Nearmap 2017

2 Legislative context

This section provides an overview of key biodiversity legislation and government policy considered in this assessment. Where available, links to further information are provided. This section does not describe the legislation and policy in detail and guidance provided here does not constitute legal advice.

2.1 Commonwealth

2.1.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is the Australian Government's key piece of environmental legislation. The EPBC Act applies to developments and associated activities that have the potential to significantly impact on Matters of National Environmental Significance (NES) protected under the Act.

Nine Matters of NES are identified under the EPBC Act:

- World heritage properties.
- National heritage places.
- Wetlands of international importance (also known as "Ramsar" wetlands).
- Nationally threatened species and ecological communities.
- Migratory species.
- Commonwealth marine areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mining).
- A water resource, in relation to coal seam gas development and large coal mining development.

Under the EPBC Act, activities that have potential to result in significant impacts on Matters of NES must be referred to the Commonwealth Minister for Agriculture, Water and the Environment for assessment.

Matters of NES relevant to the current project include nationally threatened species and ecological communities, migratory species, and national heritage places. Threatened species and ecological communities protected by the EPBC Act are outlined in Sections 4.2 and 4.3. SIC assessments are provided in Appendix 3.

An assessment of potential impacts to all Matters of NES under the provisions of the EPBC Act, and whether referral of the project to the Commonwealth Minister for Agriculture, Water and the Environment for assessment is provided in Section 6.1.

2.2 State

2.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act was enacted to encourage the proper consideration and management of impacts of proposed development or land-use changes on the environment (both natural and built) and the community. The EP&A Act is administered by the NSW Department of Planning, Industry and Environment (DPIE).

The EP&A Act provides the overarching structure for planning in NSW and is supported by other statutory environmental planning instruments. Sections of the EP&A Act of primary relevance to the natural environment are outlined further below.

Tests of Significance

Section 1.7 of the EP&A Act requires proponents and consent authorities to consider if a development will have a significant effect on threatened species, populations or communities listed under the BC Act.

Section 1.7 (Section 7.3 of the BC Act) outlines factors that must be taken into account in a ToS. Where any ToS determines that a development will result in a significant effect to a threatened species, population or community a Species Impact Statement (SIS) or preparation of a Biodiversity Development Assessment Report (BDAR) is required.

Threatened species, populations and communities listed under the BC Act are discussed in Sections 4.2 and 4.3. Tests of Significance are provided in Appendix 4.

An assessment of whether the project will result in a significant effect to any threatened species, populations or communities listed under the BC Act and whether an SIS or preparation of a BDAR, is provided in Section 6.2.

2.2.2 State Environmental Planning Policies

State Environmental Planning Policies (SEPPs) are environmental planning instruments under the EP&A Act that outline policy objectives relevant to State or regional environmental planning issues. There are over 65 SEPPs; however, only those relevant to the proposed development have been considered and are detailed below.

SEPP (Kosciuszko National Park – Alpine Resorts) 2007

SEPP (Kosciuszko National Park – Alpine Resorts) 2007 aims to protect and enhance the natural environment of the alpine resorts, in the context of Kosciuszko National Park, by ensuring that development in those resorts is managed in a way that has regard to the principles of ecologically sustainable development (including the conservation and restoration of ecological processes, natural systems and biodiversity). It applies to areas within the vicinity of Alpine Resorts as mapped within the SEPP. The study area falls with the Mt Selwyn Alpine Resort area.

Within the land use table under Mt Selwyn Alpine Resort the proposed works are permitted with consent.

SEPP (Infrastructure) 2007

The aim of this Policy is to facilitate the effective delivery of infrastructure across NSW.

Telecommunication and other communication facilities is covered under this SEPP and is able to be carried out with consent on any land pursuant to clause 115 of the act - *Development for the purposes of telecommunications facilities, other than development in clause 114 or development that is exempt development under clause 20 or 116, may be carried out by any person with consent on any land.*

The proposed works are defined as development permitted with consent under Part 3, Division 21, Clause 115. The proposed works do not satisfy the requirements for exempt or complying developments under the SEPP.

SEPP(Koala Habitat Protection) 2021

SEPP Koala Habitat Protection aims to encourage the conservation and management of natural vegetation areas that provide habitat for koalas to ensure permanent free-living populations will be maintained over their present range and to reverse the current trend of koala-population decline. It applies to the LGAs listed in Schedule 1ofo the SEPP.

Whilst the project is within Snowy Valleys LGA, a Schedule 1 listed LGA, the project is also located within the Kosciuszko National Park. Under part 1, section 6, subclause (3) of the SEPP, the policy does not apply to land dedicated or reserved under the *National Parks and Wildlife Act 1974*. As this includes the lands covered by the Kosciusko National Park the SEPP does not apply.

2.2.3 Local Environmental Plans

Local Environmental Plans (LEPs) are created by Councils in consultation with their community and guide planning decisions for LGAs. They apply either to the whole or part of a LGA and make provision for the protection or utilisation of the environment through zoning of land and development controls.

The study area is within the area of the Snowy River Local Environmental Plan 2013 although as per Part 1 Section 10 of SEPP (Kosciuszko National Park –Alpine Resorts 2007) this planning instrument does not apply.

2.2.4 Biodiversity Conservation Act 2016

The BC Act is the key piece of legislation providing for the protection and conservation of biodiversity in NSW through the listing of threatened species, populations and communities, key threatening processes (KTPs) and critical habitat for threatened species, populations and communities. Impacts to threatened species, populations and communities are assessed under Section 1.7 of the EP&A Act and Section 7.3 of the BC Act (see above). If assessment under the EP&A Act and BC Act determines a project is likely to result in a significant effect to threatened species, populations or communities then entry into the NSW Biodiversity Offsets Scheme (BOS) will be required.

Threatened species, populations and communities listed under the BC Act are discussed in Sections 4.2 and 4.3. Tests of Significance are provided in Appendix 4. An assessment of whether the project will result in a significant effect to these threatened species, populations and communities is summarised in Section 6.3.

Entry into the BOS can be triggered if the project is likely to result in a significant effect on threatened biota, will result in clearing above the threshold triggers outline in the Act, or impacts to native vegetation in areas mapped on the Biodiversity Values map (BV Map). Entry into the BOS will require further assessment in the form of a SIS or the BDAR.

2.2.5 Biosecurity Act 2015

The *Biosecurity Act 2015* (Biosecurity Act) outlines biosecurity risks and impacts, which in relation to the current assessment includes those risks and impacts associated with weeds. A biosecurity risk is defined as the risk of a biosecurity impact occurring, which for weeds includes the introduction, presence, spread or increase of a pest into or within the State or any part of the State. A pest plant that has the potential to out-compete other organisms for resources, including food, water, nutrients, habitat and sunlight and / or harm or reduce biodiversity.

Under the Biosecurity Act a priority weed is any weed identified in a local strategic plan, for a region that includes that land or area, as a weed that is or should be prevented, managed, controlled or eradicated in the

region. A local strategic plan here refers to a local strategic plan approved by the Minister under Division 2 of Part 4 of the *Local Land Services Act 2013*.

The Biosecurity Act also introduces the General Biosecurity Duty, which states:

> *All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.*

No Priority Weeds for South East LLS region, which includes the Snowy Rivers Shire LGA, were recorded in the study area. The General biosecurity duty applies to this project and unless of particular note the Biosecurity Act will not be discussed further.

2.2.6 Water Management Act 2000

The *Water Management Act 2000* (WM Act) provides for the sustainable and integrated management of the state's water for the benefit of both present and future generations based on the concept of ecologically sustainable development. Under the WM Act an approval is required to undertake controlled activities on waterfront land, unless that activity is otherwise exempt under Section 91E. Waterfront land is defined within the Act as the bed of any river, lake or estuary and any land within 40 metres of the river banks, lake shore or estuary mean high water mark.

The study area is located approximately 230 metres from the closest waterway and therefore the WM Act does not apply to the proposed works and is not discussed further.

2.3 Existing conservation agreements

A review of relevant DPIE databases identified that the study area is bound by conservation agreements associated with the *National Parks and Wildlife Act 1974* as it is located within the Kosciuszko National Park. This works is covered under the SEPP (Infrastructure) 2007 and communication with DPIE is required to undertake the works. This has been summarised in Section 2.2.1.

3 Methods

3.1 Literature and database review

In order to provide a context for the study area, information about flora and fauna from within a 10 kilometre radius of the site (the locality) was obtained from relevant public databases. Records from the following databases were collated and reviewed:

- NSW BioNet - the database for the Atlas of NSW Wildlife, Office of Environment and Heritage (OEH) for existing records of BC Act and EPBC act listed species.
- PlantNET (The Royal Botanic Gardens and Domain Trust, 2013).

Database searches were undertaken in December 2018.

Other sources information:

- Native Vegetation of the Southern Forests: South-east Highlands, Australian Alps, South-west Slopes and SE Corner bioregions (Gellie 2005).
- Biometric Vegetation Compilation. Prepared for South East Local Land Services (Eco Logical Australia 2015).
- Plan of Management: Kosciuszko National Park 2006 (Department of Environment and Conservation NSW 2006).
- Memorandum of Understanding: Australian Alps national parks (Australian Alps Liaison Committee 2016).
- NSW Scientific Committee final determinations for threatened biodiversity.

3.2 Site investigation

3.2.1 Flora assessment

The flora assessment was undertaken on 12 December 2018 using a combination of 20 x 20 metre quadrats, Biodiversity Assessment Methodology (BAM) transects, spot locations and random meanders to determine the vegetation types present.

General classification of native vegetation in NSW used in this report is based on the classification system in Keith (2004) which uses three groupings of vegetation: vegetation formation, vegetation class and vegetation type, with vegetation type the finest grouping. The grouping referred to in this report is Plant Community Type (PCT) as defined by the BAM and commonly used across NSW since 2016.

The vegetation types were stratified into PCTs broadly based on previous vegetation mapping, and the vegetation boundaries marked with a hand-held GPS in the field. Appropriate PCTs were selected on the basis of species composition and structure, known geographical distribution, landscape position, underlying geology, soil type, and any other diagnostic features.

A list of flora species was compiled for each vegetation type. Records of threatened flora species will be submitted to OEH for incorporation into the BioNet Wildlife Atlas.

The general condition of native vegetation was observed as well as the effects of current seasonal conditions. Notes were made on specific issues such as priority weed infestations, evidence of management works, and the regeneration capacity of the vegetation.

3.2.2 Fauna assessment

The study area was investigated on 12 December 2012 to determine its values for fauna. These were determined primarily on the basis of the types and qualities of habitats present. All species of fauna observed during the assessment were noted and active searching for fauna was undertaken. This included direct observation, searching under rocks and logs, and identifying calls. Particular attention was given to searching for threatened biota and their habitats. Fauna species were recorded with a view to characterising the values of the site and the investigation was not intended to provide a comprehensive survey of all fauna that has potential to utilise the site over time.

Fauna records will be submitted to OEH for incorporation into the NSW BioNet Wildlife Atlas.

3.2.3 Permits and licences

The flora and fauna assessment was conducted under the terms of Biosis' Scientific Licence issued by the Office of Environment and Heritage under the *National Parks and Wildlife Act 1974* (SL100758, expiry date 31 March 2019). Fauna survey was conducted under approval 11/355 from the NSW Animal Care and Ethics Committee (expiry date 31 January 2019).

3.3 Limitations

Ecological surveys provide a sampling of flora and fauna at a given time and season. There are a number of reasons why not all species will be detected at a site during survey, such as species dormancy, seasonal conditions, ephemeral status of waterbodies, and migration and breeding behaviours of some fauna. In many cases these factors do not present a significant limitation to assessing the overall ecological values of a site.

The current flora and fauna assessment was conducted in summer, which is an optimal time for survey.

Database searches, and associated conclusions on the likelihood of species to occur within the study area, are reliant upon external data sources and information managed by third parties.

3.4 Mapping

Aerial photography was supplied by NearMap (2018).

Field mapping was conducted using hand-held (uncorrected) GPS and tablet personal computer units (GDA94) and aerial photo interpretation. The accuracy of this mapping is therefore subject to the accuracy of the GPS units (generally ± 7 metres) and dependent on the limitations of aerial photo rectification and registration.

Mapping has been produced using a Geographic Information System (GIS). Electronic GIS files containing the relevant flora and fauna spatial data are available to incorporate into design concept plans. However this mapping may not be sufficiently precise for detailed design purposes.

4 Results

The ecological values of the study area are described below and mapped in Figure 3.

4.1 Landscape context

The study area is located above 1500 metres altitude within the Australian Alps and Kosciuszko National Park. The surrounding topography includes steep and shallow slopes with the regional landscape including extensive waterways including lakes and dams. The surrounding landscape is primarily vegetated and under conservation agreements associated with Kosciuszko National Park.

The study area is located within a small clearing in the eastern limits of the Selwyn Alpine Resort directly east of an existing telecommunications towers and associated facilities. It is located directly south of the Selwyn Trail which is used both for vehicle access to areas within the Kosciuszko National Park and as part of the Selwyn Cross Country Ski trail.

The dominant geology present is tertiary basalt of the Cabramurra – Kiandra Basalt Caps and Sands Landscape (Mitchell 2002), with soils typically rich clay loams. The soils present are important in determining the overlying vegetation.

4.2 Flora and fauna

Species recorded during the flora assessment are listed in Table A.1 of Appendix 1 (flora). Unless of particular note, these species are not discussed further. A list of threatened biota recorded or predicted to occur in the local area is also provided in those appendices, along with an assessment of the likelihood of the species occurring within the study area.

Species recorded during the fauna assessment are listed in Table A.3 of Appendix 2 (fauna). Unless of particular note, these species are not discussed further. A list of threatened biota recorded or predicted to occur in the local area is also provided in those appendices, along with an assessment of the likelihood of the species occurring within the project area.

4.3 Vegetation communities TECs and fauna habitat

Prior to the field investigation, Biosis confirmed that one endangered ecological community (EEC) has been previously mapped in the broader landscape (Gellie 2005), *Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions* (Endangered BC Act) also listed as an EEC under the EPBC Act as *Alpine Sphagnum Bogs and Associated Fens*.

The study area has previously been mapped as Montane Dry Shrub/Herb/Grass Forest (Gellie 2005) which is consistent with PCT 1196 Snow Gum - Mountain Gum shrubby open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion. PCT 1196 is associated with the threatened community *Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions* (EEC, BC Act). To satisfy requirements for listing this community must occur at altitudes between 700 – 900 metres and be located within the Sydney Basin or South Eastern Highlands Bioregions. The study area does not satisfy these requirements and therefore the occurrence of this vegetation type does not satisfy listing under the BC Act.

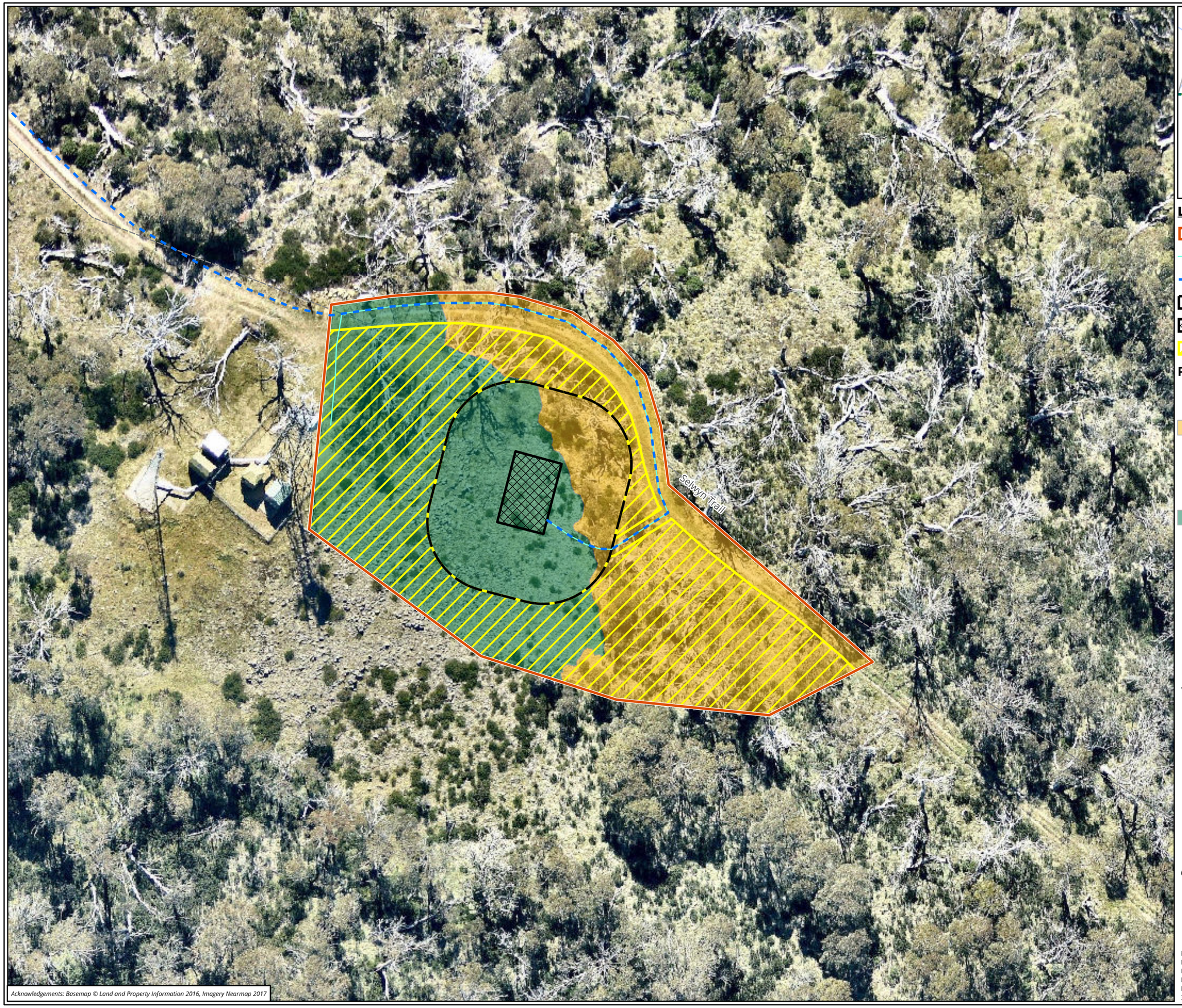
Ecological values are outlined below, divided by the vegetation communities they occur in as well as an assessment against the above mentioned TECs (refer also to Figure 3).

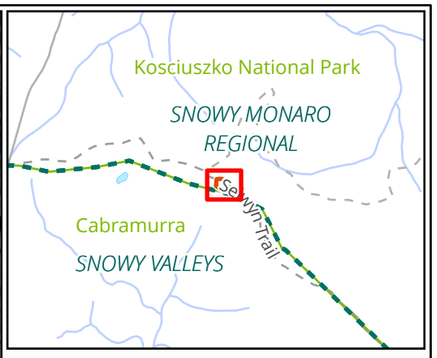
Table 1 Vegetation communities of the study area

PCT descriptions	
PCT 643 Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion	
Extent within study area	Approximately 0.15 ha of PCT 643 was recorded within the study area. This was located within the western portion of the study area which is characterised by a lack in canopy species and a greater volume of embedded surface rock.
Description including fauna habitat	This vegetation unit is characterised by low shrubs Leafy Bossiaea *Bossiaea foliosa* and Alpine Shaggy Pea *Podolobium alpestre* with high density of tussock grass Smooth Blue Snowgrass *Poa fawcettiae* and Snowgrass *Poa sieberiana* var. *sieberiana* over a rocky landscape. Other species present include Prickly Starwort *Stellaria pungens,* Grass Triggerplant *Stylidium graminifolium* and Native Violet *Viola betonicifolia.*
Condition	The community is generally in moderate condition due to its moderate species diversity with a small amount of weed infestation. The vegetation unit has good connectivity to other vegetated areas with the Kosciuszko National Park.
Associated soils and landscape position	This community occurs above 1300 m in rocky areas of the Kosciuszko National Park.
Threatened ecological community	Commonwealth EPBC Act: Not listed. NSW BC Act: Not listed. Species characteristic of locally occurring TECs were not recorded in sufficient density or abundance to be characterised as any EPBC Act or BC Act listed community. Further, PCT 643 Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion is not associated with any TEC as outlined in the BioNet database.
Threatened species habitat	This community provides habitat values in the form of dominance of tussock grasses, rocky landscape and outcrops and woody debris. This is considered to provide habitat for the following threatened flora/fauna: • Alpine She-oak Skink • Dusky Woodswallow • Mountain Pygmy-possum • Eastern Pygmy-possum • Broad-toothed Rat • Smoky Mouse
PCT 643 within the study area	

PCT descriptions	
PCT1196 Snow Gum - Mountain Gum shrubby open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion	
Extent within study area	Approximately 0.14 ha of PCT1 1196 was recorded within the study area., This vegetation was located within the eastern portion of the study area and is characterised by the presence of a canopy layer of eucalypts, higher species diversity, the presence of woody debris and denser mid and ground story layers.
Description including fauna habitat	This community consists of open woodland with three distinct stratum. The canopy is dominated by White Sally *Eucalyptus pauciflora* up to 10 m in height, the mid-story is dominated by Leafy Bossiaea which is located sometimes in rather dense patches with narrow open spaces between, the ground layer is dominated by tussock grasses such as Soft Snowgrass, Smooth Blue Snowgrass and Snowgrass. This vegetation community has a high abundance of fallen timber which would provide adequate sheltering habitat for numerous fauna species. There is still a presence of rocky habitat available within this unit but would be less desirable habitat than the vegetation unit to the west of the study area.
Condition	The community is generally in good condition due to the presence of three vegetation stratum, high floristic diversity and connection to further bushland within the Kosciuszko National Park.
Associated soils, rainfall and landscape position	This community occurs between 1450 and 1650 m on clay loam soils on a variety of geological substrates, including basalt.
Threatened ecological community	Commonwealth EPBC Act: Not listed. NSW BC Act: Not listed. This vegetation type is associated with the EEC *Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions* which only occurs at much lower altitudes (700 – 900 m) and within the Sydney Basin and South Eastern Highlands bioregions. Therefore, this vegetation unit does not satisfy requirements for EEC listing under BC Act. The PCT is not associated with any TEC listed under the EPBC Act.
Threatened species habitat	This community provides habitat values in the form of dominance of tussock grasses, woodland with shrubby mid storey, rocky landscape and outcrops and woody debris. This is considered to provide habitat for the following threatened flora/fauna: • Alpine She-oak Skink • Dusky Woodswallow • Mountain Pygmy-possum • Eastern Pygmy-possum • Broad-toothed Rat • Smoky Mouse

PCT descriptions	
PCT 1196 within the study area	





Legend

- Study area
- Trench for power line
- Proposed access track
- Asset protection zone
- Tower
- No go zone

Plant Community Types

- 1196 - Snow Gum - Mountain Gum shrubby open forest of montane areas, 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

Figure 3 Ecological values of the study area

0 4 8 12 16 20

Metres

Scale: 1:500 @ A3

Coordinate System: GDA 1994 MGA Zone 55

N

biosis

Matter: 35826,
Date: 20 October 2021 ,
Prepared for: MH, Prepared by: AM, Last edited by: amackegard
Layout: 35826_F3_EcoFeatures
Project: P:\35800s\35826\Mapping\35826_MtSelwyn.aprx

Acknowledgements: Basemap © Land and Property Information 2016, Imagery Nearmap 2017

4.4 Threatened biota

Threatened biota includes all flora and fauna species, populations and ecological communities listed under the EPBC Act and BC Act. Lists of threatened biota recorded or predicted to occur within a 10 kilometre radius of the study area are provided in Appendix 1 (flora) and Appendix 2 (fauna). An assessment of the likelihood of these species occurring in the study area, and an indication of the likelihood of the project resulting in a significant impact/effect, is included.

No areas of critical habitat for flora or fauna have been declared within the study area. Six species have been identified as having a medium or greater likelihood of occurrence. Table 2 discusses areas of value and potential impacts for all species with a medium or greater likelihood of occurrence, and determines the need for a ToS (BC Act) and/or SIC assessment (EPBC Act).

Table 2 Threatened biota likely to occur in the study area

Species name	EPBC status	BC	Relevance to study area and potential for impact
Fauna			
Alpine She-oak Skink *Cyclodomorphus praealtus*	Endangered	Endangered	Potential habitat present within tussock grasses throughout entire study area. Individuals are usually found above the tree line but have been known to inhabit areas with very sparse White Sally occurrence.
Dusky Woodswallow *Artamus cyanopterus cyanopterus*	-	Vulnerable	Potential habitat present within study area, inhabits dry open eucalypt forest with shrubby understoreys.
Mountain Pygmy-possum *Burramys parvus*	Endangered	Endangered	Potential habitat present, prefers boulder fields. The rock screes within the study area is considered potential marginal habitat.
Eastern Pygmy-possum *Cercartetus nanus*	-	Vulnerable	Potential habitat present, inhabits a wide range of forest types include dry eucalypt forest and shrub land. Common preferred feed trees (banksia, callistemon etc.) absent from study area.
Broad-toothed Rat *Mastacomys fuscus*	Vulnerable	Vulnerable	Habitat present within study area, inhabits areas with a high abundance of grasses with rocks and shrubs.
Smoky Mouse *Pseudomys fumeus*	Endangered	Critically Endangered	Habitat present within study area, inhabits sclerophyll forest on slopes. Feeds on leguminous shrubs which are available in the study area.

The study area was assessed as supporting potential habitat for seem locally occurring threatened flora species, however a comprehensive survey of the study area did not detect the presence of any of these potentially occurring flora species.

5 Ecological impacts and recommendations

This section identifies the potential impacts of proposed development on the ecological values of the study area. The principal means to reduce impacts on ecological values will be to minimise removal of native vegetation and habitat. Under the current proposal, 71 square metres of native vegetation is proposed to be removed and 0.07 hectares of vegetation is proposed to be modified for the installation of an APZ and access track. The impact to the area will be minimised by selective trimming of vegetation within the APZ to retain large trees with higher ecological values and by selecting the access area and trenching for the power line alignment to minimise the need for vegetation removal.

A summary of potential ecological impact of development of the study area and recommendations to minimise these impacts during the construction phase of the project is provided in Table 3 below.

Table 3 Ecological values, impacts and recommendations

Ecological value	Impacts	Recommendations	
		Avoid	Minimise and mitigate
Native vegetation including trees	71 square metres of PCT 643 will be cleared as part of the current proposal. 0.05 hectares of PCT 643 and 0.02 hectares of PCT 1196 will be modified for an APZ, access and trenching as part of the current proposal.	Restrict the clearing of native vegetation to the extent necessary to carry out the works. Route selection for the access track and trenching should avoid clearing native vegetation, with a particular focus on the retention of trees.	• Identifying the limits of the proposed clearing works as 'No Go' zones in a project CEMP and on site (Figure 3). • Retain mature trees during APZ establishment, particularly those that support hollows. • Ensure modification to the project consider impacts on the overall quality of any native vegetation currently to be retained. • Ensure appropriate sediment control measures are in place to ensure run-off during construction does not result in indirect impacts to native plant communities. • Any stockpiling or storage of construction materials should be located within areas to be cleared.
Threatened species habitat - removal of rocky and woody debris	Removal and modification of 0.08 hectares of habitat for the following threatened species: • Alpine She-oak Skink • Dusky Woodswallow • Mountain Pygmy Possum • Eastern Pygmy Possum • Broad-toothed Rat • Smoky Mouse	Restrict the clearing of native vegetation, and the disturbance/removal of surface rock and woody debris, to the extent necessary to carry out the works. Route selection for the access track and trenching should avoid clearing native vegetation, and the disturbance/removal of surface rock and woody debris, with a particular focus on the retention of living and fallen trees.	• Preclearance surveys are to be undertaken by an ecologist prior to removal of vegetation and disturbance/removal of surface rock and woody debris to confirm absence of threatened species. • All woody debris is to be collected and relocated into adjacent as selected by a suitably qualified ecologist.
Retained native vegetation and habitats	Potential erosion (and resultant sedimentation) on the disturbed slopes leading further ecological impacts.	Compartmentalise works as much as possible and avoid leaving areas open/disturbed for longer period of time.	• Areas left bare after works are revegetated with native species typical to the PCTs as mapped (Figure 3). • Reduce clearing within steep slope areas.

6 Assessment against key biodiversity legislation

6.1 Environment Protection and Biodiversity Conservation Act 1999

An assessment of the impacts of the proposed development on Matters of NES, against heads of consideration outlined in Commonwealth of Australia (2013) was prepared to determine whether referral of the project to the Commonwealth Minister for the Environment and Energy is required. Matters of NES relevant to the project are summarised in Table 4.

Table 4 Assessment of the project against the EPBC Act

Matter of NES	Project specifics	Assessment against Commonwealth of Australia (2013)
Threatened species	Three flora species and eight fauna species have been recorded or are predicted to occur in the locality. An assessment of the likelihood of these species occurring in the study area is provided in Table A.2 of Appendix 1 (flora) and Table A.4 of Appendix 2 (fauna). This assessment indicates that of these, four species are considered to have a medium or greater likelihood of occurrence within the study area. SIC assessments have been prepared for these species (Appendix 3).	The following species are considered to have a medium or greater likelihood of occurring within the study area: • Mountain Pygmy Possum • Smoky Mouse • Broad-toothed Rat • Alpine She-oak Skink Assessments against the Significant Impact Criteria (CoA 2013) have been prepared for these species (Appendix 3) and concluded that a significant impact is not likely to result from the project. This assessment is based upon the small impact areas and mitigation measures detailed in this report.
Threatened ecological communities	No EPBC Act listed TECs were assessed as present within the study area.	Not applicable.
Migratory species	A total of 11 migratory species have been recorded or are predicted to occur in the locality (Table A.5 of Appendix 2).	While some of these species would be expected to use the study area on occasions, the study area does not provide important habitat for an ecologically significant proportion of any of these species.
National Heritage Place	The study area is located within Kosciuszko National Park which is listed as the National Heritage Place Australian Alps National Parks and Reserves.	The proposed works will not results in the real possibility that any values associated with the national heritage place (Australian Alps National Parks and Reserve) will be lost, degraded, damaged, notably altered, modified, obscured or diminished. The proposed works will impact a small amount of vegetation within an extensive bushland patch.
Wetlands of international importance (Ramsar sites)	There are 12 Ramsar sites in NSW, the closest one being Blue Lake location approximately 57 km south-west of the study area.	The study area does not flow directly into a Ramsar site and the development is not likely to result in a significant impact.

On the basis of criteria outlined in Commonwealth of Australia (2013) it is considered unlikely that a significant impact on a Matter of NES would result from the project, and as such a referral to the Commonwealth is not recommended.

6.2 Environmental Planning and Assessment Act 1979

An assessment of the project against the relevant sections of the EP&A Act is provided below.

Tests of Significance

ToS were completed for six BC Act listed threatened species considered to have a medium or greater likelihood of occurrence within the study area (see Table 5). The ToS indicate that a significant effect is not likely to result from the project. A SIS or BDAR is therefore not required as result.

Table 5 Summary of Tests of Significance

Scientific name	Common name	BC Act consideration					Significant effect?
		1	2	3	4	5	
Cyclodomorphus praealtus	Alpine She-oak Skink	No	No	No	No	No	No
Artamus cyanopterus cyanopterus	Dusky Woodswallow	No	No	No	No	No	No
Burramys parvus	Mountain Pygmy-possum	No	No	No	No	No	No
Cercartetus nanus	Eastern Pygmy-possum	No	No	No	No	No	No
Broad-toothed Rat	Mastacomys fuscus	No	No	No	No	No	No
Smoky Mouse	Pseudomys fumeus	No	No	No	No	No	No

6.3 Biodiversity Conservation Act 2016

An assessment of the likelihood of threatened biota occurring within the study area is provided in Appendix 1 (flora) and Appendix 2 (fauna) along with an assessment of whether the project has potential to result in a significant effect. These assessments determined that six species have a medium or greater likelihood of occurring within the study area. Tests of Significance have been prepared for the threatened biota that are deemed likely to be subject to negative impacts and are provided in Appendix 4.

As outlined above the ToS indicate that a significant effect is not likely to result from the proposal.

NSW Biodiversity Offsets Scheme

Entry into the BOS can be triggered if the project is likely to result in a significant effect on threatened biota, will result in clearing above the threshold triggers outline in the Act, or impacts to native vegetation in areas mapped on the Biodiversity Values map. Entry into the BOS will require further assessment in the form of a SIS or the BDAR.

The project will not result in a significance effect on threatened biota, nor will it result in clearing over the threshold of 1 hectare for the current study area (based on minimum lot size of 190.76 hectare – refer to Appendix 5), nor is the project going to impact upon biodiversity values as mapped on the on the BV Map (refer to Appendix 5). As such the project will not enter into the BOS and no further assessment is required.

7 Conclusion

This report is an assessment of the potential impact of the installation of telecommunications tower, associated APZ, access track and trenching for power lines on ecological values within the study area in accordance with the EP&A Act, BC Act and the EPBC Act.

The proposed activities that will result in impacts to ecological values include:

- Removal of 71 square metres of PCT643 Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion for installation of the proposed telecommunications tower.
- Selective vegetation removal of 0.05 hectares of PCT643 Alpine shrubland on scree, blockstreams and rocky sites of high altitude areas of Kosciuszko National Park, Australian Alps Bioregion and 0.02 hectares PCT1196 Snow Gum - Mountain Gum shrubby open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion for installation of the APZ, access path and trenching for power lines.
- Removal and modification to 0.08 hectares of potential habitat for threatened fauna species.

No threatened biota listed under the EPBC Act or BC Act were recorded during the field surveys.

Following field investigations, six BC Act listed fauna species including four listed under the EPBC Act were determined to have a potential habitat within the study area:

- Alpine She-oak Skink *Cyclodomorphus praealtus* (Endangered, BC Act and EPBC Act).
- Dusky Woodswallow *Artamus cyanopterus cyanopterus* (Vulnerable, (BC Act).
- Mountain Pygmy-possum *Burramys parvus* (Endangered, BC Act and EPBC Act).
- Eastern Pygmy-possum *Cercartetus nanus* (Vulnerable, BC Act).
- Broad-toothed Rat *Mastacomys fuscus* (Vulnerable, BC Act and EPBC Act).
- Smoky Mouse *Pseudomys fumeus* (Critically Endangered, BC Act and Endangered EPBC Act).

ToS and SIC assessments were carried out for the above fauna species to which the proposal was considered likely to impact on limited foraging and breeding resources. These assessments concluded the proposal is unlikely to have a significant impact on any BC or EPBC Act listed fauna species. Safeguards specific to the removal of threatened and general fauna species habitat have been included in Section 5 of this report, including supervision of habitat clearance and information on ecological values to be included in site inductions and pre-start meetings (refer to Table 5 for full details regarding proposal safeguards).

It is recommended the project proceed as planned, whilst ensuring the safeguards identified in Section 5 are implemented.

References

Breed & Ford 2007. Native Mice and Rats. CSIRO Publishing: Collingwood.

Burns Phoebe A., Rowe Karen M. C., Holmes Benjamin P., Rowe Kevin C. 2016 Historical resurveys reveal persistence of smoky mouse (Pseudomys fumeus) populations over the long-term and through the short-term impacts of fire. *Wildlife Research* 42: 668-67.

Cockburn A 1981. Population regulation and dispersion of the smoky mouse, Pseudomys fumeus II. Spring decline, breeding success and habitat heterogeneity. *Australian Journal of Ecology* 6:, 255-266.

Commonwealth of Australia 2013. Matters of National Environmental Significance, Significant Impact Criteria Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999. Department of the Environment, Canberra.

DECC 2004. Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Working Draft November 2004. Department of Environment and Conservation (NSW).

DECC 2007. Threatened species assessment guidelines. The assessment of significance. Department of Environment and Conservation (NSW).

Department of the Environment, Water, Heritage and the Arts 2009. Approved Conservation Advice for Cyclodomorphus praealtus (Alpine She-oak Skink). Canberra, ACT: Department of the Environment, Water, Heritage and the Arts.

Department of Environment, Land, Water and Planning 2016. National Recovery Plan for the Mountain Pygmy-possum Burramys parvus. Australian Government, Canberra.

DPI 2018. NSW WeedWise: South East Local Land Services region.

Commonwealth of Australia 2009b. Matters of National Environmental Significance. Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999. Department of the Environment, Water, Heritage and the Arts, Canberra.

Commonwealth of Australia 2010. Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies. Significant impact guidelines 1.2. Department of the Environment, Water, Heritage and the Arts, Canberra.

Commonwealth of Australia 2013. Matters of National Environmental Significance, Significant Impact Criteria Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999. Department of the Environment, Canberra.

DE 2015. Cyclodomorphus praealtus in Species Profile and Threats Database, Department of the Environment, Canberra. Accessed 29 April 2015.

Gellie, N 2005. Native Vegetation of the Southern Forests: South-east Highlands, Australian Alps, South-west Slopes and SE Corner bioregions. *Cunninghamia* 9(2): 219-253.

Harden G 1992. *Flora of New South Wales Volume 3.* NSW University Press. Kensington.

Harden G 1993. *Flora of New South Wales Volume 4.* NSW University Press. Kensington.

Harden G 2000. *Flora of New South Wales Volume 1 (Revised Edition).* NSW University Press. Kensington.

Harden G 2002. *Flora of New South Wales Volume 2 (Revised Edition).* NSW University Press. Kensington.

Mitchell, P 2002 Descriptions for NSW (Mitchell) Landscapes. V2. Report for the Department of Environment and Climate Change.

Menkhorst, P. & L. Broome 2008. National Recovery Plan for the Smoky Mouse Pseudomys fumeus. Department of Sustainability and Environment, Melbourne.

NPWS 2000. Broad-toothed Rat. In Threatened Species of the Lower North Coast of New South Wales, p 45. NSW National Parks and Wildlife Service: Sydney.

OEH 2011. Smoky Mouse Pseudomys fumeus - critically endangered species listing NSW Scientific Committee - final determination. NSW Office of Environment and Heritage, Sydney. https://www.environment.nsw.gov.au/determinations/smokymouseFD.htm.

OEH 2017a. Broad-toothed Rat – Profile (last updated December 2017) NSW Office of Environment and Heritage, Sydney. https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10510.

OEH 2017b. Smoky Mouse – Profile (last updated December 2017) NSW Office of Environment and Heritage, Sydney. https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10686.

OEH 2017c. Mountain Pygmy-possum – Profile (last updated December 2017) NSW Office of Environment and Heritage, Sydney. https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10114.

OEH 2017d. Eastern Pygmy Possum – Profile (last updated September 2017) NSW Office of Environment and Heritage, Sydney. https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10155.

OEH 2017e. Dusky Woodswallow – Profile (last updated, December 2017) NSW Office of Environment and Heritage, Sydney. https://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20303.

OEH 2017f. Alpine She-oak Skink – Profile (last updated December 2017) NSW Office of Environment and Heritage, Sydney. https://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20164.

OEH 2017g. Biodiversity Assessment Method. 59 Goulburn Street, Sydney NSW 2000.

OEH 2018. BioNet the website for the Atlas of NSW Wildlife.

RBGDT 2013. PlantNET - The Plant Information Network System of the Royal Botanic Gardens and Domain Trust, Sydney, Australia (Version 2). Office of Environment and Heritage (OEH) NSW, Sydney.

Rigg, J, Mcdougall, K & Liew, E 2018. Susceptibility of nine alpine species to the root rot pathogens Phytophthora cinnamomi and P. cambivora. *Australasian Plant Pathology*. 47.

Swan G, Shea G & Sadlier R. 2004. Cyclodomorphus praeltus. In A field guide to reptiles of New South Wales, 2nd Ed, p. 124. Reed New Holland: Sydney.

Threatened Species Scientific Committee (TSSC) 2009. Commonwealth Listing Advice on Cyclodomorphus praealtus (Alpine She-oak Skink). Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

Threatened Species Scientific Committee 2018. Conservation Advice Burramys parvus mountain pygmy-possum. Canberra: Department of the Environment and Energy.

Van Dyck and Strahan 2006. Broad-toothed Rat. In The Mammals of Australia, 3rd Ed, pp 589-591. Reed New Holland: Sydney.

Whisson, D, Holland, G & Kelly, T 2015. Persistence of a threatened species in a modified alpine resort environment: the broad-toothed rat. *Journal of Mammalogy* 96(1): 151-158.

Wilson S. & Swan G. 2003. A Complete Guide to Reptiles of Australia, p. 480. Reed New Holland: Sydney.

Appendices

Appendix 1 Flora

Flora species recorded from the study area

Notes to tables:

Status – EPBC Act: CE – Critically Endangered EN – Endangered VU – Vulnerable	**Status – BC Act:** E1 – endangered species (Part 1, Schedule 1) E2 – endangered population (Part 2, Schedule 1) E4 – presumed extinct (Part 4, Schedule 1) E4A – critically endangered V – vulnerable (Part 1, Schedule 2)
Status – Exotic # – Native species outside natural range * – priority weed species declared under the Biosecurity Act	

Table A.1 Flora species recorded from the study area

Scientific name	Common name	Commonwealth status	NSW status
Native species			
Acaena novae-zelandiae	Bidgee-widgee		
Aciphylla simplicifolia	Mountain Aciphyll		
Arthropodium milleflorum	Pale Vanilla-lily		
Asperula gunnii	Mountain Woodruff		
Brachycome spathulata			
Carex breviculmis			
Celmisia costiniana			
Diuris monticola			
Erigeron bellidioides			
Erigeron nitidus			
Eucalyptus pauciflora	White Sally		
Euchiton fordianus			
Geranium potentilloides			
Lobelia pedunculata	Matted Pratia		
Luzula alpestris			
Microseris lanceolata	Yam Daisy		
Oreomyrrhis eriopoda	Australian Carraway		
Pimelea alpina			

Scientific name	Common name	Commonwealth status	NSW status
Pimelea ligustrina			
Poa fawcettiae	Smooth Blue Snowgrass		
Poa hiemata	Soft Snowgrass		
Poa phillipsiana			
Poa sieberiana* var. *sieberiana	Snowgrass		
Podolobium alpestre	Alpine Shaggy Pea		
Pultenaea foliolosa	A Bush Pea		
Senecio gunnii			
Stackhousia monogyna	Creamy Candles		
Stellaria pungens	Prickly Starwort		
Stylidium graminifolium	Grass Triggerplant		
Tasmannia xerophila	Alpine Pepperbush		
Viola betonicifolia	Native Violet		
Wahlenbergia ceracea	Waxy Bluebell		
Exotic species			
Hypochaeris radicata	Catsear		
Trifolium repens	White Clover		

Locally occurring threatened flora species and ecological communities

The following table includes a list of the threatened flora species that have potential to occur within the study area. The list is based on database searches outlined in Section 3.1.

Notes to tables:

Conservation status – EPBC Act:	**Conservation status – BC Act:**
CR – Critically Endangered EN – Endangered VU – Vulnerable	E1 – endangered species (Part 1, Schedule 1) E2 – endangered population (Part 2, Schedule 1) E4 – presumed extinct (Part 4, Schedule 1) E4A – critically endangered V1 – vulnerable (Part 1, Schedule 2)
Most recent record # species predicted to occur by the PMST (not recorded on other databases). ## species predicted to occur based on natural distributional range and suitable habitat despite lack of records in the databases searched. 2017 recorded during current survey.	

Examples of criteria for determining the likelihood of occurrence for threatened biota as a guide for writing the rationale for likelihood have been listed below.

Likelihood of occurrence	Potential criteria for likely occurrence in study area
Recorded	• Recorded in the study area during current assessment. • Records in study area, as indicated by background research.
High	• Species/ecological communities recorded in study area during current or previous assessment/s. • Aquatic species recorded from connected waterbodies in close proximity to the study area during current or previous assessment/s. • Sufficient good quality habitat is present in study area or in connected waterbodies in close proximity to the study area (aquatic species). • Study area is within species natural distributional range (if known). • Species has been recorded within <five kilometres or 10 kilometres> or from the relevant catchment/basin.
Medium	• Records of terrestrial biota within <five kilometres or 10 kilometres> of the study area or of aquatic species in the relevant basin/neighbouring basin. • Habitat limited in its capacity to support the species due to extent, quality, or isolation.
Low	• No records within <five kilometres or 10 kilometres> of the study area or for aquatic species, the relevant basin/neighbouring basin. • Marginal habitat present (low quality and extent). • Substantial loss of habitat since any previous record(s).
Negligible	• Habitat not present in study area. • Habitat present but sufficient targeted survey has been conducted at an optimal time of year and species wasn't recorded.

Table A.2 Threatened flora species recorded / predicted to occur within 10 kilometres of the study area

Scientific name	Common name	Conservation status		Likely occurrence in study area	Potential for significant impact from project	Rationale
		EPBC	BC			
Xerochrysum palustre	Swamp Everlasting	V		Negligible	None	No habitat present, prefers bogs and swamps on peaty soils.
Prasophyllum retroflexum	Kiandra Leek Orchid	V	V	Negligible	None	Habitat present in study area, sufficient survey effort conducted at optimum time of year (flowering) to discount presence.
Pterostylis foliata	Slender Greenhood		V	Negligible	None	Habitat present in study area, sufficient survey effort conducted at optimum time of year (flowering) to discount presence.
Discaria nitida	Leafy Anchor Plant		V	Low	None	Marginal habitat present within study area, prefers areas close to waterbodies. Sufficient survey effort conducted at optimum time of year (flowering) to discount presence.
Thesium australe	Austral Toadflax	V	V	Low	None	Marginal habitat present within study area. Sufficient survey effort conducted at optimum time of year (flowering) to discount presence.

Appendix 2 Fauna

Fauna species recorded from the study area

Below is a list of fauna species recorded from the study area during the present assessment and a list of threatened fauna species recorded or predicted to occur within 10 kilometres of the study area.

Fauna species in these tables are listed in alphabetical order within their taxonomic group.

Notes to table:

Status – EPBC Act: CE – Critically Endangered EN – Endangered VU – Vulnerable	**Status – BC Act:** E1 – endangered species (Part 1, Schedule 1) E2 – endangered population (Part 2, Schedule 1) E4 – presumed extinct (Part 4, Schedule 1) E4A – critically endangered V – vulnerable (Part 1, Schedule 2)
	Status – Non-indigenous species * pest species not native to the area

Table A.3 Vertebrate fauna recorded from the study area (current assessment)

Scientific name	Common name	Commonwealth status	NSW status
Birds			
Corvus coronoides	Australian Raven		
Cracticus tibicen	Australian Magpie		
Pachycephala rufiventris	Rufous Whistler		
Pardalotus striatus	Striated Pardalote		
Reptiles			
Pseudemoia entrecasteauxii	Tussock Cool-skink		

Threatened fauna species

The following table includes a list of the threatened fauna species that have potential to occur within the study area. The list is based on database searches outlined in Section 3.1.

Notes to tables:

Conservation status – EPBC Act:	**Conservation status – BC Act:**
CR – Critically Endangered EN – Endangered VU – Vulnerable	E1 – endangered species (Part 1, Schedule 1) E2 – endangered population (Part 2, Schedule 1) E4 – presumed extinct (Part 4, Schedule 1) E4A – critically endangered V1 – vulnerable (Part 1, Schedule 2)
Most recent record # species predicted to occur by the PMST (not recorded on other databases). ## species predicted to occur based on natural distributional range and suitable habitat despite lack of records in the databases searched. 2017 recorded during current survey.	

Examples of criteria for determining the likelihood of occurrence for threatened biota as a guide for writing the rationale for likelihood have been listed below.

Likelihood of occurrence	Potential criteria
High	• Species recorded in study area during current or previous assessment/s.. • Sufficient good quality habitat is present in study area or in connected waterbodies in close proximity to the study area (aquatic species). • Study area is within species natural distributional range (if known). • Species has been recorded within 10 kms or from the relevant catchment/basin.
Medium	• Records of terrestrial species within 10 kms of the study area or of aquatic species in the relevant basin/neighbouring basin. • Habitat limited in its capacity to support the species due to extent, quality, or isolation.
Low	• No records within 5 kms of the study area or for aquatic species, the relevant basin/neighbouring basin. • Marginal habitat present (low quality and extent). • Substantial loss of habitat since any previous record(s).
Negligible	• Habitat not present in study area • Habitat present but sufficient targeted survey has been conducted at an optimal time of year and species wasn't recorded.
Transient/ Nomadic	• Migratory or nomadic fauna species/individuals that may occur in the study area from time to time, but are not considered resident.

Table A.4 Threatened fauna species predicted to occur, within 10 kilometres of the study area

Scientific name	Common name	Conservation status		Likely occurrence in study area	Potential for significant impact from project	Rationale
		EPBC	BC			
Pseudophryne corroboree	Southern Corroboree Frog	CE	E4A	Negligible	None	No habitat present within the study area, the Southern Corroboree Frog is limited to sphagnum bogs.
Litoria verreauxii alpina	Alpine Tree Frog	V	E1	Negligible	None	No habitat present within study area, nearest water body is over 230 m from study area.
Cyclodomorphus praealtus	Alpine She-oak Skink	E	E1	Medium	Low	Marginal habitat present within tussock grasses throughout entire study area. Individuals are usually found above the tree line but have been known to inhabit areas with very sparse White Sally occurrence.
Haliaeetus leucogaster	White-bellied Sea-Eagle		V	Transient	Low	No habitat present, requires large waterbodies and tall mature Eucalyptus forest. May occasionally forage above study area.
Hieraaetus morphnoides	Little Eagle		V	Transient	Low	No habitat present. Requires tall trees to build nests. May occasionally forage above study area.
Callocephalon fimbriatum	Gang-gang Cockatoo		V	Transient	Low	No habitat present. Study area located on the extremities on the distribution range where the Gang-gang Cockatoo is rare. The study area does not provide suitable habitat without the presence of large hollows. Prefers heavily timbered and mature wet sclerophyll forests.
Tyto tenebricosa	Sooty Owl		V	Negligible	None	No habitat present, prefers rainforests and most eucalyptus forests. Requires very large hollows for nesting.
Pachycephala olivacea	Olive Whistler		V	Negligible	None	No habitat present, prefer wet forests.
Artamus cyanopterus cyanopterus	Dusky Woodswallow		V	Medium	Low	Marginal habitat present within study area, inhabits dry open Eucalyptus forest with shrubby understoreys.

Scientific name	Common name	Conservation status		Likely occurrence in study area	Potential for significant impact from project	Rationale
		EPBC	BC			
Petroica boodang	Scarlet Robin		V	Negligible	None	No habitat present, Scarlet Robin is not known to inhabit areas above 1000 m above sea level.
Petroica phoenicea	Flame Robin		V	Transient	Low	No habitat present within study area, migrates to upland areas for breeding but prefer moist tall Eucalyptus forest. May use the study area in transit to lowland areas during winter.
Petroica rodinogaster	Pink Robin		V	Negligible	None	No habitat present, prefers moist tall Eucalyptus forest and densely vegetated gullies.
Burramys parvus	Mountain Pygmy-possum	E	E1	Medium	Low	Marginal habitat present, prefers boulder fields. The rock screes within the study area is considered potential marginal habitat.
Cercartetus nanus	Eastern Pygmy-possum		V	Medium	Low	Marginal habitat present, inhabits a wide range of forest types include dry Eucalypt forest and shrub land. Preferred feed trees (banksia, callistemon and eucalyptus) are low in study area.
Petaurus australis	Yellow-bellied Glider		V	Negligible	None	No habitat present, prefers tall Eucalyptus forests.
Falsistrellus tasmaniensis	Eastern False Pipistrelle		V	Negligible	None	No habitat present, prefers tall moist habitats. No suitable hollows present within study area for nesting.
Miniopterus orianae oceanensis	Eastern Bentwing-bat		V	Negligible	None	No habitat present, prefers caves. May occasionally forage over study area.
Myotis macropus	Southern Myotis		V	Negligible	None	No habitat present, prefers hollows, caves, mine shafts, storm water channels, building, under bridges and in dense foliage. Forages over waterways.

Scientific name	Common name	Conservation status		Likely occurrence in study area	Potential for significant impact from project	Rationale
		EPBC	BC			
Mastacomys fuscus	Broad-toothed Rat	V	V	Medium	Low	Habitat present within study area, inhabits areas with a high abundance of grasses with rocks and shrubs.
Pseudomys fumeus	Smoky Mouse	E	E4A	Medium	Low	Habitat present within study area, inhabits sclerophyll forest on slopes. Feeds on leguminous shrubs which are available in the study area.

Migratory species (EPBC Act listed)

The following table includes a list of migratory species that have potential to occur within the study area. The list is based on database searches outlined in Section 3.1.

Bold denotes species recorded in the study area during the current assessment.

Table A.5 Migratory fauna species recorded or predicted to occur within 10 kilometres of the study area

Scientific name	Common name
Actitis hypoleucos	Common Sandpiper
Apus pacificus	Fork-tailed Swift
Calidris acuminata	Sharp-tailed Sandpiper
Calidris ferruginea	Curlew Sandpiper
Calidris melanotos	Pectoral Sandpiper
Gallinago hardwickii	Latham's Snipe
Hirundapus caudacutus	White-threated Needletail
Motacilla flava	Yellow Wagtail
Myiagra cyanoleuca	Satin Flycatcher
Numenius madagascariensis	Eastern Curlew
Rhipidura rufifrons	Rufous Fantail

Appendix 3 Significant Impact Criteria assessments

Alpine She-oak Skink

Alpine She-oak Skink is listed as an endangered species under the EPBC Act. This species is endemic to NSW and Victoria, and in NSW has only been recorded within Kosciuszko National Park between Smiggins Holes and Kiandra, in areas above 1500 metres (OEH 2017f; Swan et al. 2004; Wilson & Swan 2003).

In NSW, the Alpine She-oak Skink is only found in alpine and subalpine grassland where there is dense groundcover of tussock grasses (DE 2015). It is a secretive creature and spends most of its time sheltering in tussock grasses or under litter, rocks, logs and other ground debris, but will also use tussock clumps to bask on (OEH 2017f; Swan et al. 2004).

The Alpine She-oak Skink is largely carnivorous, consuming molluscs, arthropods, and occasionally small lizards and snakes. Adults of this species appear to have small home ranges. Little is known about the breeding patterns of this species though a summer breeding period seems likely based on museum records (OEH 2017f).

Alpine She-oak Skink was not recorded during the surveys. There are known records of the species within 10 kilometres of the study area (OEH 2018). Potential habitat for this species occurs throughout the entire study area with a dominance of tussock grass, and ample rocky and woody debris present. Potential habitat located in the study area forms part of a habitat corridor which travels north to south.

Occurrence in the study area

The habitat present within the study area provides foraging, sheltering and breeding habitat for the Alpine She-oak Skink. The presence of tussock grasses and woody and rocky debris contribute to the good quality habitat present.

Significant impact assessment

Based on a reasonable understanding of potential to impact individual species, amount of potential to be remove and mitigation measures to minimise impact and likely populations of Alpine She-oak Skink in the study area, it is concluded that project impacts are unlikely to lead to a significant impact. An assessment and justification is provided in Table A.6.

Table A.6 Alpine She-oak Skink, endangered species - assessment against Significant Impact Criteria (CoA 2013)

Significant impact criteria (critically endangered / endangered species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of a population	Unlikely	The removal of 71 square metres and modification of 0.07 ha of habitat will minimally decrease the availability of habitat within the locality. In light of this, it is proposed that a pre-disturbance survey will be undertaken in areas of suitable habitat, and relevant safeguards implemented to prevent direct impacts. Due to the small amount of clearing proposed and the availability of habitat adjoining the study area as well as the implementation of mitigation measures it is unlikely that the proposed works with lead to a long-term decrease in the size of a population of the Alpine She-oak Skink.
Reduce the area of occupancy of the species	Unlikely	The removal of up to 71 square metres of moderate potential habitat will reduce the area of occupancy for the population. This habitat accounts for less than 0.01% of mapped habitat available for the Alpine She-oak Skin in the locality. In addition, a pre-disturbance survey will be undertaken in areas of suitable habitat, and relevant safeguards implemented to prevent direct impacts. Due to the small amount of clearing proposed and the availability of habitat adjoining the study area as well as the implementation of mitigation measures the proposed works will no significantly reduce the area of occupancy of the Alpine She-oak Skink.
Fragment an existing population into two or more populations	Unlikely	There is no records of population from within or adjacent to the study area. The removal of 71 square metres of habitat within the study area is located adjacent to an area previously disturbed by the installation of another telecommunications tower and the Selwyn Trail. Fragmentation resulting from the removal of this vegetation will be minimal and will not remove continuity of the bushland within the locality. Therefore, it is unlikely that the proposed works will fragment an existing population into two or more populations.
Adversely affect habitat critical to the survival of the species	Unlikely	Critical habitat has not been declared for Alpine She-oak Skink.

Significant impact criteria (critically endangered / endangered species)	Likelihood of significant impact	Justification
Disrupt the breeding cycle of a population	Unlikely	Impacts likely to disrupt the breeding cycle of Alpine She-oak Skink include habitat loss and fragmentation, and direct mortality. The proposal will remove 71 square metres and modify 0.07 ha of potential habitat. The habitat to be removed is within a large patch (>1000 hectares) of good quality bushland extending throughout the Kosciuszko National Park. This habitat accounts for 0.01% of habitat available to the Alpine She-oak Skink in the locality. Direct mortality of individuals will be avoided by implementing preclearance surveys. These mitigation measures will reduce the potential impact on any Alpine She-oak Skink. Therefore, the proposed action will not to disrupt the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	The proposal will remove 71 square metres and modify 0.07 ha of potential habitat. This habitat accounts for less than 0.01% of habitat available for the Alpine She-oak Skink in the locality. In addition, a pre-disturbance survey would be undertaken in areas of suitable habitat, and relevant safeguards implemented to prevent direct impacts. These mitigation measures will reduce the potential impact on any Alpine She-oak Skink. Therefore the proposed action is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Unlikely	The proposed works will not increase invasive fauna species. Invasive weeds species are not known to directly harm populations of Alpine She-oak Skink. Invasive weed species have potential to reduce quality of habitat in the adjoining bushland and increase potential to harm the population of Alpine She-oak Skink. Construction activities will be managed through standard practices to avoid further spread of weeds.
Introduce disease that may cause the species to decline	Unlikely	The project will not result in the introduction of a disease that is harmful to Alpine She-oak Skink.

Significant impact criteria (critically endangered / endangered species)	Likelihood of significant impact	Justification
Interfere with the recovery of a species	Unlikely	There is no adopted or made recovery plan for the Aline She-oak Skink. The approved conservation advice (Department of Environment, Water, Heritage and the Arts 2009) and listing advice (Threatened Species scientific Committee 2009) states the following as priority issues affecting the recovery of the species. 1. Habitat Loss, Disturbance and Modification 2. Invasive Weeds 3. Trampling, Browsing or Grazing 4. Animal Predation 5. Fire None of these factor will be substantially increased by the proposed works. Considering the above factors, the project will not interfere substantially with the recovery of Alpine She-oak Skink.

Mountain Pygmy-possum

Mountain Pygmy-possum is listed as an endangered species under the EPBC Act. The Mountain Pygmy-possum is restricted to very high altitudes within the alps of NSW and Victoria (OEH 2017). It prefers areas of large boulderfields which have been deposited from past glacial event where the Bogong Moth are in highest numbers. Kosciuszko National Park is one of three known populations of the Mountain Pygmy-possum.

Mountain Pygmy Possum is threatened by a number of processes including loss and fragmentation habitat through land-clearing, mortality on roads through habitat and movement areas, predation from cats, dogs and foxes (Threatened Species Scientific Committee 2018).

Mountain Pygmy Possum was not recorded during the surveys (no targeted survey was undertaken). There are known records of the species within 10 kilometres of the study area (OEH 2018). There is potential for the study area to be used occasionally by this species for foraging and as movement corridor, although it is unlikely that individuals rely upon resources in the study area.

Occurrence in the study area

The habitat present within the study area provides marginal habitat in the form of movement corridors. The study area provide low quality sheltering and foraging habitat as it lacks large rocky debris or boulder fields, with these landscape being also absent from the broader landscape.

Significant impact assessment

Based on a reasonable understanding of the habitat requirements and likely populations of Mountain Pygmy-possum in the study area, it is concluded that project impacts are unlikely to lead to a significant impact. An assessment and justification is provided in Table A.7.

Table A.7 Mountain Pygmy Possum, endangered species - assessment against Significant Impact Criteria (CoA 2013)

Significant impact criteria (critically endangered / endangered species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of a population	Unlikely	The removal of 71 square metres and modification of 0.07 ha of habitat will minimally decrease the availability of habitat within the locality. The habitat present within the study area is marginal and would more likely be used by the Mountain Pygmy-possum as a movement corridor. This habitat accounts for less than 0.01% of similar habitat available for the Mountain Pygmy-possum in the locality. In light of this, it is proposed that a pre-disturbance survey will be undertaken in areas of suitable habitat, and relevant safeguards implemented to prevent direct impacts. Due to the small amount of clearing proposed and the availability of habitat adjoining the study area as well as the implementation of mitigation measures it is unlikely that the proposed works with lead to a long-term decrease in the size of a population of the Mountain Pygmy Possum.
Reduce the area of occupancy of the species	Unlikely	The removal of up to 71 square metres of moderate potential habitat will reduce the area of occupancy for the population. The habitat present within the study area is marginal and would more likely be used by the Mountain Pygmy-possum as a movement corridor. This habitat accounts for less than 0.01% of similar habitat available for the Mountain Pygmy-possum in the locality. In addition, a pre-disturbance survey will be undertaken in areas of suitable habitat, and relevant safeguards implemented to prevent direct impacts. Due to the small amount of clearing proposed and the availability of habitat adjoining the study area as well as the implementation of mitigation measures the proposed works will no significantly reduce the area of occupancy of the Mountain Pygmy-possum.

Significant impact criteria (critically endangered / endangered species)	Likelihood of significant impact	Justification
Fragment an existing population into two or more populations	Unlikely	There is no records of population from within or adjacent to the study area. The removal of 71 square metres of habitat within the study area is located adjacent to areas previously disturbed by the installation of another telecommunications tower and the Selwyn Trail. Fragmentation resulting from the removal of this vegetation will be minimal and will not remove continuity of the bushland within the locality. Therefore, it is unlikely that the proposed works will fragment an existing population into two or more populations.
Adversely affect habitat critical to the survival of the species	Unlikely	All habitat that provides potential movement corridors for the Mountain Pygmy-possum is considered critical habitat (Department of Environment, Land, Water and Planning 2016). The proposed works are unlikely to adversely impact the use of the study area as a movement corridor due to the small scale of vegetation removal.
Disrupt the breeding cycle of a population	Unlikely	Impacts likely to disrupt the breeding cycle of Mountain Pygmy-possum include direct mortality, disturbance to breeding sites, loss of breeding and sheltering habitat, loss and fragmentation of foraging habitat and fragmentation of movement corridors. The proposal will remove 71 square metres and modify 0.07 ha of potential habitat. The habitat to be removed is within a large patch (>1000 hectares) of good quality bushland extending throughout the Kosciuszko National Park. It is likely that if the species uses the study area for foraging and as a movement corridor then the local population would use the entire patch of bushland. Direct mortality of individuals will be avoided by implementing preclearance surveys. These mitigation measures will reduce the potential impact on any Mountain Pygmy-possum. Therefore, the proposed action will not to disrupt the breeding cycle of an important population.

Significant impact criteria (critically endangered / endangered species)	Likelihood of significant impact	Justification
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	The proposal will remove 71 square metres and modify 0.07 ha of potential habitat. This habitat accounts for less than 0.01% of habitat available for the Mountain Pygmy-possum in the locality. The habitat available within the study area provides marginal habitat for foraging as the Mountain Pygmy Possum prefers large boulderfields. In addition, a pre-disturbance survey will be undertaken in areas of suitable habitat, and relevant safeguards implemented to prevent direct impacts. These mitigation measures will reduce the potential impact on any Mountain Pygmy Possum. Therefore the proposed action is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Unlikely	The proposed works will not increase invasive fauna species. Invasive weeds species are not known to directly harm populations of Mountain Pygmy-possum. Invasive weed species have potential to reduce quality of habitat in the adjoining bushland and increase potential to harm the population of Mountain Pygmy-possum. Construction activities will be managed through standard practices to avoid further spread of weeds.
Introduce disease that may cause the species to decline	Unlikely	The project will not result in the introduction of a disease that is harmful to Mountain Pygmy Possum.

Significant impact criteria (critically endangered / endangered species)	Likelihood of significant impact	Justification
Interfere with the recovery of a species	Unlikely	The National Recovery Plan for Mountain Pygmy-possum (Department of Environment, Land, Water and Planning 2016) identifies the following as threats to the recovery of the Mountain Pygmy-possum. 1. Loss, degradation and fragmentation of habitat 2. Erosion and sedimentation 3. Predation by cats and foxes 4. Genetic loss and small populations 5. Winter impacts from ski resort operations and snowsports activity 6. Bushfire and planned fuel hazard reduction burns 7. Climate Change and indirect effects 8. Decline in Bogong Moths 9. Weed Invasion and competition from introduced species The proposed actions will remove and modified a small amount of habitat within a large patch of potential habitat of the Mountain Pygmy-possum. Considering the above factors, the project will not interfere substantially with the recovery of Winged Pepper-cress.

Broad-toothed Rat

In NSW, this species is found in two widely separated areas: the wet alpine and subalpine heaths and woodlands of the Snowy Mountains and an endangered population on the Barrington Tops (OEH 2017a). Populations of the Broad-toothed Rat appear to be restricted to patches of optimum habitat characterised by areas with a moderate to dense groundcover of grasses, sedges and shrubs (NPWS 2000; Van Dyck & Strahan 2008). In the Snowy Mountains, they are often found near streams and steep banks where an abundance of grasses, rushes and shrubs provide dense understorey. The Broad-toothed Rat is the most specialised herbivore of all Australian rodents and has broad, specialised teeth adapted to a high-fibre diet (Breed & Ford 2007). They predominantly consume grasses, and to a lesser extent the leaves of shrubs, sedge stems, bark, seeds, and moss spore cases (NPWS 2000; Van Dyck & Strahan 2008).

The Broad-toothed Rat lives in a complex of runways under dense heath vegetation and builds well-insulated nests of shredded grass in these runways or under logs. The runways are cool in summer, and relatively warm in winter, enabling this species to remain active throughout the year. In the Snowy Mountains, the breeding season occurs from December to March (Van Dyck & Strahan 2008). The home range of the Broad-toothed Rat varies according to season. Outside the breeding season, the home range of males and females is 0.1 hectares. During the breeding season, it increases to 0.16 hectares for females and 0.27 hectares for males (Van Dyck & Strahan 2008). The home range of males overlaps with those of several females. Individuals nest alone (females with young until weaned) except in winter, when up to five individuals share a group nest (Van Dyck & Strahan 2008).

Broad-toothed Rat was not recorded during the surveys. There are known records of the species within 10 kilometres of the study area (OEH 2018). Potential habitat for this species occurs within the study area, primarily in the form of woody debris and dense shrubs and tussock grasses.

Occurrence in the study area

The habitat present within the study area provides foraging and sheltering habitat for the Broad-toothed Rat. The presence of tussock grasses and woody and rocky debris contribute to the good quality habitat present.

Significant impact assessment

Based on a reasonable understanding of the habitat requirements and likely populations of Broad-toothed Rat in the study area, it is concluded that project impacts are unlikely to lead to a significant impact. An assessment and justification is provided in Table A.8.

Table A.8 Broad-toothed Rat, EPBC vulnerable species - assessment against Significant Impact Criteria (CoA 2013)

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population of a species	Unlikely	This is not an important population, as any Broad-toothed Rat population that may potentially occur within the study area is not considered to be a key source population either for breeding or dispersal, a populations necessary for maintaining genetic diversity, or a population near the limit of the species range. The removal of 71 square metres and modification of 0.07 ha of habitat will minimally decrease the availability of habitat within the locality. However, the local population can safely be assumed to have access to the entire bushland patch which is greater than 1000 hectares. Hence, the proposed works will impact 0.01 % of potential habitat within the locality and is not considered significant. Due to the small amount of clearing proposed and the availability of habitat adjoining the study area it is unlikely that the proposed works with lead to a long-term decrease in the size of an important population of the Broad-toothed Rat.
Reduce the area of occupancy of an important population	Unlikely	This is not an important population. The removal of 71 square metres and modification of 0.07 ha of habitat will minimally decrease the availability of habitat within the locality. However, the local population can safely be assumed to have access to the entire bushland patch which is greater than 1000 hectares. Hence, the proposed works will impact 0.01 % of potential habitat within the locality and is not considered significant.
Fragment an existing important population into two or more populations	Unlikely	This is not an important population. The vegetation to be removed and modified is located adjacent to an area previously disturbed for the installation of a telecommunications tower and facility, minor increase in the extent of this clearing is unlikely to further fragment the habitat

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
		available and therefore will not fragment an important population into two or more population.
Adversely affect habitat critical to the survival of the species	Unlikely	Critical habitat has not been declared for Broad-toothed Rat.
Disrupt the breeding cycle of an important population	Unlikely	This is not an important population. Impacts likely to disrupt the breeding cycle of Broad-toothed Rat include direct mortality, disturbance to breeding sites, loss of breeding and sheltering habitat, loss and fragmentation of foraging habitat and fragmentation of movement corridors. The proposal will remove 71 square metres and modify 0.07 ha of potential habitat. The habitat to be removed is within a large patch (>1000 hectares) of good quality bushland extending throughout the Kosciuszko National Park. It is likely that if the species uses the study area for foraging and sheltering then the local population would use the entire patch of bushland. Direct mortality of individuals will be avoided by implementing preclearance surveys. These mitigation measures will reduce the potential impact on any Broad-nosed Rat. Therefore, the proposed action will not to disrupt the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	The proposal will remove 71 square metres and modify 0.07 ha of potential habitat. The habitat to be removed is within a large patch (>1000 hectares) of good quality bushland extending throughout the Kosciuszko National Park. It is likely that if the species uses the study area for foraging and sheltering then the local population would use the entire patch of bushland. Direct mortality of individuals will be avoided by implementing preclearance surveys. These mitigation measures will reduce the potential impact on any Broad-nosed Rat. Therefore the proposed action is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely	The proposed works will not increase invasive fauna species. Invasive weeds species are not known to directly harm populations of Broad-toothed Rat. Invasive weed species have potential to reduce quality of habitat in the adjoining bushland and increase potential to harm the population of Broad-toothed Rat. Construction activities will be managed through standard practices to avoid further spread of weeds.
Introduce disease that may cause the species to decline	Unlikely	The project will not result in the introduction of a disease that is harmful to the Broad-toothed Rat.

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
Interfere substantially with the recovery of a species	Unlikely	There is no accepted or adopted recovery plan associated with Broad-nosed Rat. The conservation advice gives priority to the following conservation actions. 1. Implement predator control programs. 2. Maintain and protect habitat, including reducing the frequency of extensive and intense fires, and reducing the impacts of livestock and feral herbivores. The proposed actions will remove and modified a small amount of habitat within a large patch of potential habitat of the Broad-toothed Rat. Considering the above factors, the Project will not interfere substantially with the recovery of Broad-toothed Rat.

Smoky Mouse

Smoky Mouse is listed as an endangered species under the EPBC Act. The Smoky Mouse primarily occurs within New South Wales in the most southern end of the state around Mt Poole and Nullica State Forest. The Smoky Mouse has 3 records from Kosciuszko National Park (OEH 2018).

The Smoky Mouse occurs within a wide range of vegetation types and known to live in heath, sclerophyll forest and op-forest along ridge tops and slopes from the coast to 1800 metres above sea level. It can sometimes also live in ferny gullies (OEH 2017). There is indication that the Smoky Mouse prefers ridge-top sclerophyll forest with floristically diverse shrub layers dominated by Ericaceae and Fabaceae families. The occurrence of tussock grass, rocks and logs for sheltering is also important (OEH 2011).

The Smoky Mouse lives in small groups with up to five breeding females for each male with large burrow system (OEH 2011). The presence of good quality habitat with abundant food resources is particularly important in winter to ensure young mice are able to survive the winter (Cockburn, 1981).

Smoky Mouse is threatened by a number of processes including loss and fragmentation habitat through land-clearing, plant dieback due to *Phytophthora cinnamomi,* mortality on roads through habitat and movement areas, predation from cats, dogs and foxes.

Smoky Mouse was not recorded during the surveys (no targeted survey was undertaken). There are known records of the species within 10 kilometres of the study area (OEH 2018b). There is potential for the study area to be used for sheltering, breeding or foraging.

Occurrence in the study area

The habitat present within the study area provides potential foraging and sheltering habitat for the Smoky Mouse. Although the Smoky Mouse has only three recorded occurrence within the Kosciuszko National Park this species has been known to have low detectability during low population fluctuations (Burn et al 2015).

Significant impact assessment

Based on a reasonable understanding of the habitat requirements and likely populations of Smoky Mouse in the study area, it is concluded that project impacts are unlikely to lead to a significant impact. An assessment and justification is provided in Table A.9.

Table A.9 Smoky Mouse, endangered species - assessment against Significant Impact Criteria (CoA 2013)

Significant impact criteria (critically endangered / endangered species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of a population	Unlikely	The removal of 71 square metres and modification of 0.07 ha of habitat will minimally decrease the availability of habitat within the locality. This habitat accounts for less than 0.01% of similar habitat available for the Smoky Mouse in the locality. In addition, it is proposed that a pre-disturbance survey will be undertaken in areas of suitable habitat, and relevant safeguards implemented to prevent direct impacts. Due to the small amount of clearing proposed and the availability of habitat adjoining the study area as well as the implementation of mitigation measures it is unlikely that the proposed works with lead to a long-term decrease in the size of a population of the Smoky Mouse.
Reduce the area of occupancy of the species	Unlikely	The removal of up to 71 square metres of moderate potential habitat will reduce the area of occupancy for the population. This habitat accounts for less than 0.01% of similar habitat available for the Smoky Mouse in the locality. In addition, a pre-disturbance survey will be undertaken in areas of suitable habitat, and relevant safeguards implemented to prevent direct impacts. Due to the small amount of clearing proposed and the availability of habitat adjoining the study area as well as the implementation of mitigation measures the proposed works will no significantly reduce the area of occupancy of the Mountain Pygmy-possum.
Fragment an existing population into two or more populations	Unlikely	There is no records of population from within or adjacent to the study area. The removal of 71 square metres of habitat within the study area is located within an area previously disturbed by the installation of another telecommunications tower and the Selwyn Trail. Fragmentation resulting from the removal of this vegetation will be minimal and will not remove continuity of the bushland within the locality. Therefore, it is unlikely that the proposed works will fragment an existing population into two or more populations.
Adversely affect habitat critical to the survival of the species	Unlikely	There is no declared critical habitat for the Smoky Mouse.

Significant impact criteria (critically endangered / endangered species)	Likelihood of significant impact	Justification
Disrupt the breeding cycle of a population	Unlikely	Impacts likely to disrupt the breeding cycle of Smoky Mouse include direct mortality, disturbance to breeding sites, loss of breeding and sheltering habitat, loss and fragmentation of foraging habitat and fragmentation of movement corridors. The proposal will remove 71 square metres and modify 0.07 ha of potential habitat. The habitat to be removed is within a large patch (>1000 hectares) of good quality bushland extending throughout the Kosciuszko National Park. It is likely that if the species uses the study area for foraging, breeding and sheltering then the local population would use the entire patch of bushland. Direct mortality of individuals will be avoided by implementing preclearance surveys. These mitigation measures will reduce the potential impact on any Smoky Mouse. Therefore, the proposed action will not to disrupt the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	The proposal will remove 71 square metres and modify 0.07 ha of potential habitat. This habitat accounts for less than 0.01% of habitat available for the Smoky Mouse in the locality. In addition, a pre-disturbance survey will be undertaken in areas of suitable habitat, and relevant safeguards implemented to prevent direct impacts. These mitigation measures will reduce the potential impact on any Smoky Mouse. Therefore the proposed action is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Unlikely	The proposed works will not increase invasive fauna species. Invasive weeds species are not known to directly harm populations of Smoky Mouse. Invasive weed species have potential to reduce quality of habitat in the adjoining bushland and increase potential to harm the population of Smoky Mouse. Construction activities will be managed through standard practices to avoid further spread of weeds.

Significant impact criteria (critically endangered / endangered species)	Likelihood of significant impact	Justification
Introduce disease that may cause the species to decline	Unlikely	The Smoky Mouse can be impacted by the introduction of *Phytophthora cinnamomi*. *Phytophthora cinnamomi* is considered unsuitable to survive within high alpine conditions (Rigg, Mcdougall and Liew 2018). The project is unlikely to result in the introduction of a disease that is harmful to Smoky Mouse, based on effective implementation of a project CEMP.
Interfere with the recovery of a species	Unlikely	The National Recovery Plan for Smoky Mouse (Menkhorst and Broome 2008) identifies seven specific objectives for the recovery of the Smoky Mouse are to: 1. Designate protection zones around known populations. 2. Refine knowledge of the distribution and abundance. 3. Examine population partitioning. 4. Minimise predation by the Red Fox, Feral Cat and Wild Dog. 5. Establish small-mammal refuges. 6. Develop and test burning regimes to maintain and enhance habitat quality. 7. Study habitat preference, diet and the effects of disturbance on population survival 8. and connectivity. 9. Establish a captive breeding colony of Smoky Mice. 10. Establish and minimise risk of Phytophthora cinnamomi infection. 11. Increase community awareness and involvement. Considering the above factors, the project will not interfere substantially with the recovery of Smoky Mouse.

Appendix 4 Tests of Significance

The following section provides for Tests of Significance according to the Test of Significance outlined in Section 7.3 of the BC Act for all species listed as a medium likelihood or greater in Appendix 1 and Appendix 2.

Interpretation of key terms

Study area*: means the area directly affected by the proposal and any additional areas which are likely to be affected by the proposal, either directly or indirectly. The study area should extend as far as is necessary to take all potential impacts into account.*

Direct impacts*: are those that directly affect the habitat and individuals. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat. When applying each factor, consideration must be given to all of the likely direct impacts of the proposed activity or development.*

Indirect impacts*: occur when project-related activities affect species, populations or ecological communities in a manner other than direct loss. Indirect impacts can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas. As with direct impacts, consideration must be given, when applying each factor, to all of the likely indirect impacts of the proposed activity or development.*

Life cycle*: the series or stages of reproduction, growth, development, ageing and death of an organism.*

Viable*: the capacity to successfully complete each stage of the life cycle under normal conditions.*

Local Population / Locality: *the population that occurs in the study area. The assessment of the local population may be extended to include individuals beyond the study area if it can be clearly demonstrated that contiguous or interconnecting parts of the population continue beyond the study area, according to the following definitions.*

  - *The local population of a threatened fauna species comprises those individuals occurring in the study area or the cluster of individuals that extend into habitat adjoining and contiguous with the study area that could reasonably be expected to be mating and utilising the same area for foraging/breeding with those in the study area.*
  - *Locality has the same meaning as ascribed to local population of a species.*

- **Risk of extinction**: the likelihood that the local population will become extinct either in the short-term or in the long-term as a result of direct or indirect impacts on the viability of that population.

Habitat*: the area occupied, or periodically or occasionally occupied, by any threatened species, population or ecological community and includes all the different aspects (both biotic and abiotic) used by species during the different stages of their life cycles.*

Extent: *the physical area removed and/or to the compositional components of the habitat and the degree to which each is affected.*

Importance: *related to the stages of the species' life cycles and how reproductive success may be affected.*

Locality*: the same meaning as ascribed to local population of a species or local occurrence of an ecological community.*

Alpine She-oak Skink

The Alpine She-oak Skink is listed as Endangered under the BC Act. This species is endemic to NSW and Victoria, and in NSW has only been recorded within Kosciuszko National Park between Smiggins Holes and Kiandra, in areas above 1500 metres (OEH 2014; Swan et al. 2004; Wilson & Swan 2003).

In NSW, the Alpine She-oak Skink is only found in alpine and subalpine grassland where there is dense groundcover of tussock grasses (DE 2015). It is a secretive creature and spends most of its time sheltering in tussock grasses or under litter, rocks, logs and other ground debris, but will also use tussock clumps to bask on (OEH 2014; Swan et al. 2004).

The Alpine She-oak Skink is largely carnivorous, consuming molluscs, arthropods, and occasionally small lizards and snakes. Adults of this species appear to have small home ranges. Little is known about the breeding patterns of this species, though a summer breeding period seems likely based on museum records (OEH 2014).

Alpine She-oak Skink was not recorded during the surveys. There are known records of the species within 10 kilometres of the study area (OEH 2018b). Potential habitat for this species occurs throughout the entire study area with a dominance of tussock grass, and ample rocky and woody debris present. Potential habitat located in the study area forms part of a habitat corridor which travels north to south.

(a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Impacts from the projects which have potential to have an adverse effect on the life cycle of Alpine She-oak Skink include habitat loss and fragmentation, and direct mortality.

The proposed works will impact on 0.08 hectares of medium quality habitat through the removal and modification of vegetation, woody debris and rocky debris. The area to be impacted occurs within a large patch (>1000 hectares) of potential habitat for Alpine She-oak Skink. As the habitat to be impacted is relatively small within a large habitat corridor it is unlikely the removal of this habitat will have an adverse effect of the life cycle of the species.

The installation of the tower may provide greater perching opportunity as an additional means for birds of prey to predate on Alpine She-oak Skink. However, considering there are existing towers in the area surrounding the site, and other hunting strategies are already employed by these birds, predation on Alpine She-oak Skink by birds is not expected to increase significantly as a result of the tower installed for the Project.

The proposed works will include preclearance investigation by an appropriately qualified ecologist to ensure that there is no presence of individuals prior to minimise the potential for direct mortality from the works. All woody debris will be stockpiled and re-located within adjacent retained areas.

The small area of habitat proposed to be impacted could impact individuals, however, the small scale of clearance proposed with added mitigation measures, within an area containing larger continuous areas of suitable habitat, is considered unlikely to affect a viable local population of the species such that it is could be placed at risk of extinction.

(b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable.

(c) In relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The proposed works will require the removal and modification of 0.08 hectares of vegetation for the installation of a telecommunication tower and installation of an APZ, access path and trenching for power lines. The area to be impacted occurs within a large patch (>1000 hectares) of potential habitat for the Alpine She-oak Skink.

Proposed works has the potential to modify adjoining bushland by increase edge effects, sedimentation and accidental modification by workers. Recommendations contained within the report aim to minimise indirect impact from the works and when implemented will ensure that the extent of habitat to be removed or modified is limited to those within the relatively small impact area.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

Potential habitat for the Alpine She-oak Skink surrounds the study area in all direction. The removal of 0.08 hectares of habitat will not isolate any potential habitat patches. Although the removal and modification of vegetation will result in minor fragmentation impacts, the overall continuity of the potential habitat for the Alpine She-oak Skink will be maintained.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The small area of potential habitat proposed for removal would represent a small proportion of available habitat for the species in the local area. The site is located within a larger area of bushland which would provide equal habitat potential than the area to be impacted by the proposed works. The importance of this area within the larger extent of habitat available would be considered quite low and the species would not rely on the resources within the locality.

(d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The proposed works will not have an adverse effect on an area of outstanding biodiversity value (either directly or indirectly).

(e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The Project has the potential to increase the operation of the following key threatening process (KTPs) relevant to the Alpine She-oak Skink:

- Removal of deadwood and dead trees.
- Removal of native vegetation.

Removal of deadwood and dead trees will be limited to a 0.08 hectares with a large (>1000 hectares) patch of bushland containing large amounts of dead wood and dead trees. The study area and bushland patch adjoining the study area are conserved under the Kosciuszko National Park where it is an offence to remove dead wood and dead trees other than under approved projects. The dead wood and dead trees to be removed within the study area are to be stockpiled and redistributed throughout the adjoining park and therefore resulting in minimal overall impacts to removal of dead wood and dead trees.

Due to the small amount of habitat removal and mitigation measures it is unlikely the proposed works will significantly increase the impact of any KTPs associated with the Alpine She-oak Skink.

Conclusion

In light of the consideration of the above five factors, it is unlikely that the proposed work will impose a significant impact on the Alpine She-oak Skink or its habitat as:

- The removal of potential habitat is limited to 0.08 hectares within a large (>1000 hectares) patch of bushland containing potential habitat.
- The habitat will be removed under supervision of an ecologist who will first conduct a preclearance investigation to discount presence of Alpine She-oak Skink.
- The Project will not adversely affect the lifecycle of the species such that its local occurrence is placed at risk of extinction.
- The Project will not further fragment or isolate habitat for the species or affect its long term survival in the study area or in the locality.
- The area of habitat to be impacted by the proposed works is small and is not considered to be important for the long term survival of Alpine She-oak Skinks in the locality.
- The Project will not significantly contribute to any KTP that is either currently in operation within the study area or that has the potential to come into operation.

Mammals

Broad-toothed Rat

The Broad-toothed Rat *Mastacomys fuscus* is listed as Vulnerable under the BC Act. In NSW, this species is found in two widely separated areas: the wet alpine and subalpine heaths and woodlands of the Snowy Mountains and an endangered population on the Barrington Tops (OEH 2017a). Populations of the Broad-toothed Rat appear to be restricted to patches of optimum habitat characterised by areas with a moderate to dense groundcover of grasses, sedges and shrubs (NPWS 2000; Van Dyck & Strahan 2008). In the Snowy Mountains, they are often found near streams and steep banks where an abundance of grasses, rushes and shrubs provide dense understorey. The Broad-toothed Rat is the most specialised herbivore of all Australian rodents and has broad, specialised teeth adapted to a high-fibre diet (Breed & Ford 2007). They predominantly consume grasses, and to a lesser extent the leaves of shrubs, sedge stems, bark, seeds, and moss spore cases (NPWS 2000; OEH 2012; Van Dyck & Strahan 2008).

The Broad-toothed Rat lives in a complex of runways under dense heath vegetation and builds well-insulated nests of shredded grass in these runways or under logs. The runways are cool in summer, and relatively warm in winter, enabling this species to remain active throughout the year. In the Snowy Mountains, the breeding season occurs from December to March (Van Dyck & Strahan 2008). The home range of the Broad-toothed Rat varies according to season. Outside the breeding season, the home range of males and females is 0.1 hectares. During the breeding season, it increases to 0.16 hectares for females and 0.27 hectares for males (Van Dyck & Strahan 2008). The home range of males overlaps with those of several females. Individuals nest alone (females with young until weaned) except in winter, when up to five individuals share a group nest (Van Dyck & Strahan 2008).

Broad-toothed Rat was not recorded during the surveys (no targeted survey was undertaken). There are known records of the species within 10 kilometres of the study area (OEH 2018). Potential habitat for this species occurs within the study area, primarily in the form of sheltering and foraging habitat among shrubs and tussock grasses, although it is unlikely that individuals rely upon resources in the study area.

Smoky Mouse

The Smoky Mouse is listed as Critically Endangered under the BC Act. The Smoky Mouse primarily occurs within New South Wales in the most southern end of the state around Mt Poole and Nullica State Forest. The Smoky Mouse has 3 records from Kosciuszko National Park (OEH 2018).

The Smoky Mouse occurs within a wide range of vegetation types and known to live in heath, sclerophyll forest and op-forest along ridge tops and slopes from the coast to 1800 metres above sea level. It can sometimes also live in ferny gullies (OEH 2017b). There is indication that the Smoky Mouse prefers ridge-top sclerophyll forest with floristically diverse shrub layers dominated by Ericaceae and Fabaceae families. The occurrence of tussock grass, rocks and logs for sheltering is also important (OEH 2011).

The Smoky Mouse lives in small groups with up to five breeding females for each male with large burrow system (OEH 2011). The presence of good quality habitat with abundant food resources is particularly important in winter to ensure young mice are able to survive the winter (Cockburn, 1981).

Smoky Mouse was not recorded during the surveys (no targeted survey was undertaken). There are known records of the species within 10 kilometres of the study area (OEH 2018). Potential habitat for this species occurs within the study area, primarily in the form of sheltering and foraging habitat among shrubs and tussock grasses, although it is unlikely that individuals rely upon resources in the study area.

Mountain Pygmy-possum

Mountain Pygmy-possum is listed as an endangered species under the EPBC Act. The Mountain Pygmy-possum is restricted to very high altitudes within the alps of NSW and Victoria (OEH 2017). It prefers areas of

large boulderfields which have been deposited from past glacial event where the Bogong Moth are in highest numbers. Kosciuszko National Park is one of three known populations of the Mountain Pygmy-possum.

Mountain Pygmy Possum is threatened by a number of processes including loss and fragmentation habitat through land-clearing, mortality on roads through habitat and movement areas, predation from cats, dogs and foxes.

Mountain Pygmy Possum was not recorded during the surveys (no targeted survey was undertaken). There are known records of the species within 10 kilometres of the study area (OEH 2018). There is potential for the study area to be used occasionally by this species for foraging and as movement corridor, although it is unlikely that individuals rely upon resources in the study area.

Eastern Pygmy-possum

Eastern Pygmy Possum is listed as a vulnerable species under the BC Act. Found over a broad range of habitat yet seems to prefer woodlands and heath, feeding on nectar, pollen and insects. Eastern Pygmy possums shelter in hollows, rotting trunks, holes in ground, Ringtail Possum dreys or thickets of vegetation. Breeding nests are restricted to the use of tree hollows with one possum using multiple hollows at once (OEH 2017d).

Eastern Pygmy Possum is threatened by a number of processes including loss and fragmentation habitat through land-clearing, mortality on roads through habitat and movement areas, predation from cats, dogs and foxes (OEH 2017d).

Eastern Pygmy Possum was not recorded during the surveys (no targeted survey was undertaken). There are known records of the species within 10 kilometres of the study area (OEH 2018b). There is potential for the study area to be used occasionally by this species for foraging, although it is unlikely that individuals rely upon resources in the study area.

(a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Impacts from the projects which have potential to have an adverse effect on the life cycle of Broad-toothed Rat, Smoky Mouse, Mountain Pygmy-possum and Eastern Pygmy-possum include direct mortality, loss of potential breeding and sheltering habitat, loss and fragmentation of foraging habitat and fragmentation of movement corridors.

The proposed works will impact on 0.08 hectares of medium quality habitat through the removal of vegetation, woody debris and rocky landscape. The area occurs within a large patch (>1000 hectares) of potential habitat for the Broad-toothed Rat, Smoky Mouse, Mountain Pygmy-possum and Eastern Pygmy-possum. The removal of this habitat is unlikely to have a substantial impact on increase fragmentation of the habitat, and will over provide over a very small (<0.01%) of habitat available for all four species within the locality.

The installation of the tower may provide greater perching opportunity as an additional means for birds of prey to predate on these species. However, considering there are existing towers in the area surrounding the site, and other hunting strategies are already employed by these birds, predation on these species by birds is not expected to increase significantly as a result of the tower installed for the Project.

The proposed works will include preclearance investigation by an appropriately qualified ecologist to ensure that there is no presence of individuals prior to minimise the potential for direct mortality from the works. All woody debris will be stockpiled and re-located within adjacent retained areas.

The small area of habitat proposed for removal could impact individuals, however, the small scale of clearance proposed with added mitigation measures, within an area containing larger continuous areas of suitable habitat, is considered unlikely to affect a viable local population of the species such that it is could be placed at risk of extinction.

(b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable.

(c) In relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The proposed works will require the removal and modification 0.08 hectares of habitat for the installation of a telecommunication tower and installation of an APZ, access path and trenching for power lines. The impact will include the removal of tussock grasses, woody debris and rocky debris. The area occurs within a large patch (>1000 hectares) of potential habitat for Broad-toothed Rat, Smoky Mouse, Mountain Pygmy-possum and Eastern Pygmy-possum.

Proposed works has the potential to modify adjoining bushland by increase edge effects, sedimentation and accidental modification by workers. Recommendations contained within the report aim to minimise indirect impact from the works and when implemented will ensure that the extent of habitat to be removed or modified is limited to those within the relatively small impact area.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

The removal of a small amount of vegetation, whilst maintaining the overall continuity of the vegetation, will unlikely increase fragmentation impacts within the patch. The removal of this small amount of potential habitat will not isolate any habitat areas.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

There is potential that the Broad-toothed Rat, Smoky Mouse, Mountain Pygmy-possum and Eastern Pygmy-possum may use the study area as a movement corridor whilst traversing through the patch of vegetation that the study area forms part of. The movement corridor will be retained as the removal of a relatively small amount of vegetation will not substantially impact the continuity of the corridor.

The small area of potential habitat proposed for removal would represent a small proportion of available habitat for the species in the local area. The site is located within a larger area of bushland which would provide equal habitat potential than the area to be impacted by the proposed works. The importance of this area within the larger extent of habitat available would be considered quite low and the species would not rely on the resources within the locality.

Whilst the potential habitat will be removed the overall continuity of the habitat patch will be maintain and therefore the removal of this habitat will not have a significant impact on the long-term survival of these species.

(d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The proposed works will not have an adverse effect on an area of outstanding biodiversity value (either directly or indirectly).

(e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The proposed works has the potential to increase the operation of the following KTPs relevant to the species:

- Removal of deadwood and dead trees.
- Removal of native vegetation.

Removal of deadwood and dead trees will be limited to 0.08 hectares within a large (>1000 hectares) patch of bushland containing large amounts of dead wood and dead trees. The study area and bushland patch adjoining the study area are conserved under the Kosciuszko National Park where it is an offence to remove dead wood and dead trees other than under approved projects. The dead wood and dead trees to be removed within the study area are to be stockpiled and redistributed throughout the adjoining park and therefore resulting in minimal overall impacts to removal of dead wood and dead trees.

Due to the small amount of habitat removal it is unlikely the proposed works will significantly increase the impact of any KTPs associated with these species.

Conclusion

In light of the consideration of the above five factors, it is unlikely that the proposed work will impose a significant impact on the Broad-toothed Rat, Smoky Mouse, Mountain Pygmy-possum and Eastern Pygmy-possum or their habitats as:

- The removal of potential habitat is limited to 0.08 hectares within a large (>1000 hectares) patch of bushland containing potential habitat.
- The habitat will be removed under supervision of an ecologist who will first conduct a preclearance investigation to discount presence of Broad-toothed Rat, Smoky Mouse, Mountain Pygmy-possum and Eastern Pygmy-possum.
- The Project will not adversely affect the lifecycle of the species such that its local occurrence is placed at risk of extinction.
- The Project will not further fragment or isolate habitat for the species or affect its long term survival in the study area or in the locality.
- The area of habitat to be impacted by the proposed works is small and is not considered to be important for the long term survival of Broad-toothed Rat, Smoky Mouse, Mountain Pygmy-possum and Eastern Pygmy-possum in the locality.
- The Project will not significantly contribute to any KTP that is either currently in operation within the study area or that has the potential to come into operation.

Dusky Woodswallow

Dusky Woodswallow is listed as a vulnerable species under the BC Act. Found over a broad range of habitats, primarily inhabiting dry open Eucalypt forests and woodland, yet can be found in moist forest or rainforest. Dusky Woodswallows can be resident or migratory birds depending on location. Populations in NSW migrate to south-eastern Queensland after breeding in spring.

Dusky Woodswallow nest in open cup shaped nests, generally occurring in shrubs or low trees. Dusky Woodswallow primarily eat insects whilst flying high but can also forage under canopy over leaf litter or dead timber (OEH 2017e).

Dusky Woodswallow is threatened by a number of processes including loss and fragmentation habitat through land-clearing, aggressive exclusion by over abundant noisy miners and reduction in availability of food resources due to overgrazing and removal of leaf litter (OEH 2017e).

Dusky Woodswallow was not recorded during the surveys (no targeted survey was undertaken). There are known records of the species within 10 kilometres of the study area (OEH 2018). There is potential for the study area to be used occasionally by this species for foraging, although it is unlikely that individuals rely upon resources in the study area.

(a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Impacts from the projects which have potential to have an adverse effect on the life cycle of Dusky Woodswallow include direct mortality, loss of potential nesting and sheltering habitat, loss and fragmentation of foraging habitat.

The proposed works will impact on 0.08 hectares of medium quality habitat through the removal of vegetation, woody debris and rocky landscape. The area occurs within a large patch (>1000 hectares) of potential habitat for the Dusky Woodswallow.

It is likely that if the species uses the study area for foraging then the local population would use the entire patch of bushland. The bushland patch contains areas within that would provide higher productivity areas for foraging with areas containing more open shrub layer, access to riparian corridors and higher diversity of flora species.

The small area of habitat proposed for removal could impact individuals, however, the small scale of clearance proposed within an area containing larger continuous areas of suitable habitat, is considered unlikely to affect a viable local population of the species such that it is could be placed at risk of extinction.

(b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable.

(c) In relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The proposed works will require the removal and modification of 0.08 hectares of vegetation for the installation of a telecommunication tower and installation of an APZ, access path and access to power lines. The proposed works will impact on 0.08 hectares of medium quality habitat through the removal of vegetation, removal of dead trees and shrubs which all provide forage habitat for the species. The area to be impacted consists of a very small portion of habitat present within a large patch (>1000 hectares) of potential habitat for Dusky Woodswallow.

Proposed works has the potential to modify adjoining bushland by increase edge effects, sedimentation and accidental modification by workers. Recommendations contained within the report aim to minimise indirect impact from the works and when implemented will ensure that indirect impacts of adjoining bushland is unlikely.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

The removal of a small amount of vegetation, whilst maintaining the overall continuity of the vegetation, will unlikely increase fragmentation impacts within the patch. The removal of this small amount of potential habitat will not isolate any habitat areas.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The small area of potential habitat proposed for removal and modification would represent a small proportion of available habitat for the Dusky Woodswallow in the local area. The site is located within a larger area of bushland which would provide equal habitat potential than the area to be impacted by the proposed works. The importance of this area within the larger extent of habitat available would be considered quite low and the species would not rely on the resources within the locality.

Whilst the potential habitat within the study area will be removed and modified the overall continuity of the habitat patch will be maintain and therefore the removal of this habitat will not have a significant impact on the long-term survival of these species.

(d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The proposed works will not have an adverse effect on an area of outstanding biodiversity value (either directly or indirectly).

(e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The proposed works has the potential to increase the operation of the following KTPs relevant to the Broad-toothed Rat:

- Clearing of native vegetation.

Clearing and modification of native vegetation will be limited to 0.08 hectare in a large patch of bushland which contains similar or better quality habitat.

Due to the small amount of habitat removal it is unlikely the proposed works will significantly increase the impact of any KTPs associated with these species.

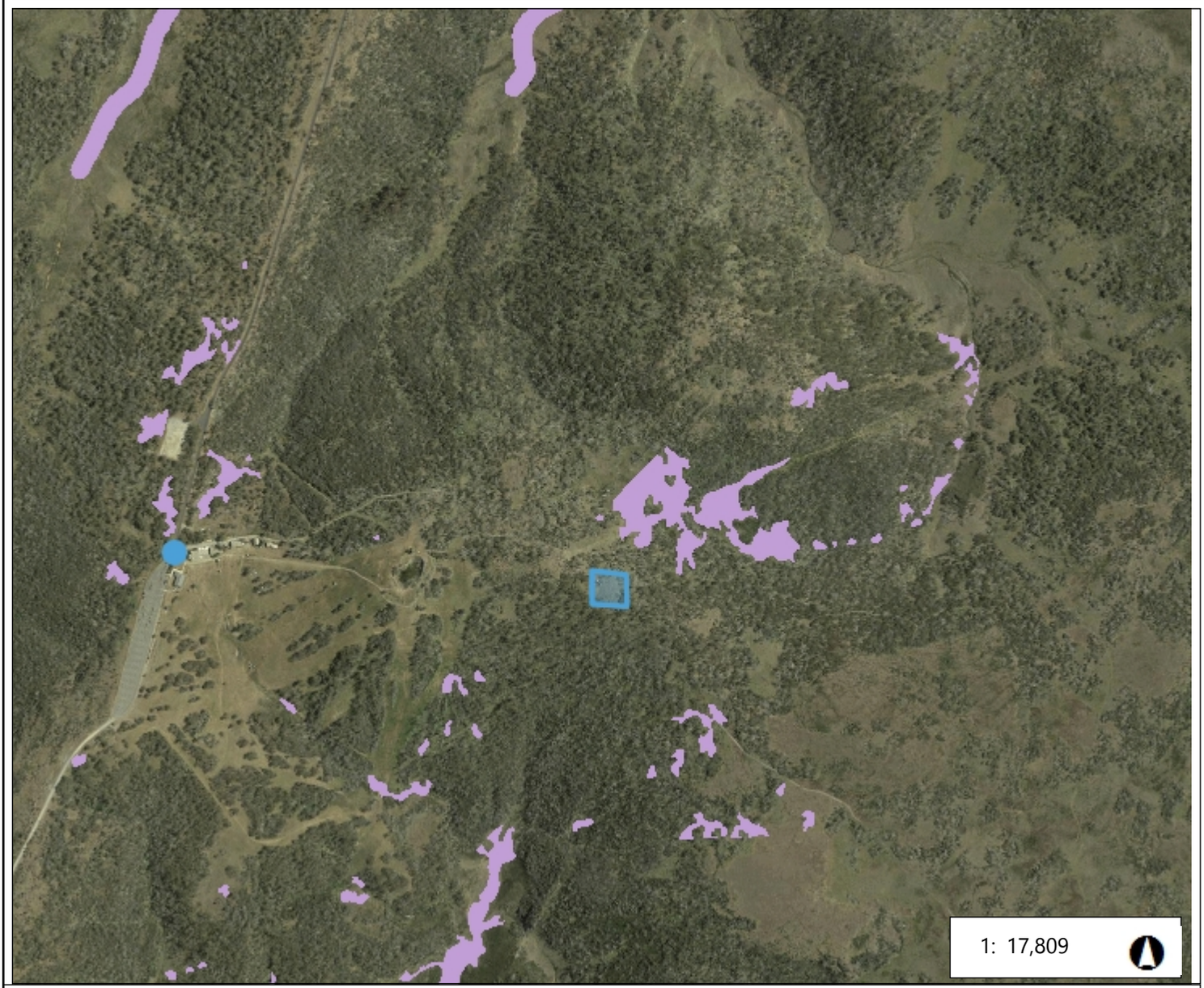
Conclusion

In light of the consideration of the above five factors, it is unlikely that the proposed work will impose a significant impact on the Dusky Woodswallow or their habitats as:

- The removal of potential habitat is limited to 0.08 hectares within a large (>1000 hectares) patch of bushland containing potential habitat.
- The Project will not adversely affect the lifecycle of the species such that its local occurrence is placed at risk of extinction.
- The Project will not further fragment or isolate habitat for the species or affect its long term survival in the study area or in the locality.
- The area of habitat to be impacted by the proposed works is small and is not considered to be important for the long term survival of Dusky Woodswallow in the Locality.
- The Project will not significantly contribute to any KTP that is either currently in operation within the study area or that has the potential to come into operation.

Appendix 5 BOSET report

Biodiversity Offset Scheme (BOS) Entry Threshold Map



904.7 0 452.36 904.7 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days

Notes

Biodiversity Values Map and Threshold Report

Results Summary

Date of Calculation	20/10/2021 12:39 PM		**BDAR Required***
Total Digitised Area	0.63	ha	
Minimum Lot Size Method	Lot size		
Minimum Lot Size	190.76	ha	
Area Clearing Threshold	1	ha	
Area clearing trigger Area of native vegetation cleared	no		no
Biodiversity values map trigger Impact on biodiversity values map(not including values added within the last 90 days)?	no		no
Date of the 90 day Expiry	N/A		

*If BDAR required has:

- at least one 'Yes': you have exceeded the BOS threshold. You are now required to submit a Biodiversity Development Assessment Report with your development application. Go to https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor to access a list of assessors who are accredited to apply the Biodiversity Assessment Method and write a Biodiversity Development Assessment Report
- 'No': you have not exceeded the BOS threshold. You may still require a permit from local council. Review the development control plan and consult with council. You may still be required to assess whether the development is '"likely to significantly affect threatened species' as determined under the test in s. 7.3 of the Biodiversity Conservation Act 2016. You may still be required to review the area where no vegetation mapping is available.

Where the area of impact occurs on land with no vegetation mapping available, the tool cannot determine the area of native vegetation cleared and if this exceeds the Area Threshold. You will need to work out the area of native vegetation cleared - refer to the BOSET user guide for how to do this.

On and after the 90 day expiry date a BDAR will be required.

Disclaimer

This results summary and map can be used as guidance material only. This results summary and map is not guaranteed to be free from error or omission. The State of NSW and Office of Environment and Heritage and its employees disclaim liability for any act done on the information in the results summary or map and any consequences of such acts or omissions. It remains the responsibility of the proponent to ensure that their development application complies will all aspects of the *Biodiversity Conservation Act 2016.*

The mapping provided in this tool has been done with the best available mapping and knowledge of species habitat requirements. This map is valid for a period of 30 days from the date of calculation (above).

Acknowledgement

I as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature_____ Date:20/10/2021 12:39 PM