

1.3 DIRECT AND INDIRECT IMPACTS

Direct impacts on flora and fauna arising from the proposal will predominately comprise the removal of 36 Snow Gum trees, eight of which are described as small and/or very young trees, the pruning of branches on eight trees, and the removal of the tops of 56 rocks.

The direct impacts can be summarised as follows:

- **tree removal:** the removal of 36 Snow Gum trees, eight of which are described as small and/or very young trees, and the pruning of branches on eight trees. None of the trees to be affected are hollow-bearing.
- **rock removal:** the removal of the tops of 56 rocks
- **bridge construction:** The temporary damage to and shading of approximately 80 m² of Tall Alpine Heath in association with the proposed bridge

Indirect impacts associated with the proposal are expected to be relatively minor as:

- the footprint of the proposed direct impacts is small
- the proposal will be implemented using low impact methods and with adequate safeguards. These include undertaking the tree removal by hand prior to winter, and undertaking the rock removal and bridge construction during low snow levels, thus removing the need for summer vehicle access

The proposal is not anticipated to result in any substantial changes in surface or subsurface hydrology which may lead to the loss or adverse modification of vegetation communities or associated habitats. Similar developments throughout the resort have had negligible impact on surface and subsurface hydrology, aquatic ecosystems or vegetation communities beyond the immediate footprint.

The proposal is not expected to have any substantial long-term adverse impacts on habitat connectivity. On the contrary the proposed offset plantings will improve connectivity between remnant patches of vegetation.

Whilst there are areas of bog surrounding the proposed tree and rock removal in places, the proposal will have only minor temporary impacts on heathy shrubs associated with bogs such as *Richea continentis* (Candle Heath), where they occur around the bases of some rocks. The proposal is not expected to result in any long-term adverse impacts on bogs.

1.4 OFFSETS

The proposal includes rehabilitation actions to offset the potential impacts on vegetation and fauna habitats.

Field investigations and consultation with Perisher Blue identified a potential rehabilitation area that could be used for offsetting the impacts of the proposal as identified below:

- to plant replacement (locally propagated) Snow Gum trees at a ratio of 2:1 at the Guthega Saddle, on the western side of the snow fence adjacent to the Bloody Mary Ski Run
- trees: 44 to be removed or pruned – 88 to be planted (2:1) over 132 m² (1 per 1.5m²).
- heath: Temporary damage/shading of 80m² to be – 160m² of area to be planted (2:1).



Photo 7: The proposed offset plantings at the bottom of Bloody Mary ski run will provide improved connectivity to the remnant vegetation either side of the run.

1.5 SUBJECT SITE, STUDY AREA AND LOCALITY

The subject site for the purposes of this report comprises those areas, as described in Section 1.1 and in **Figure 1**, which will be directly impacted by the proposal.

The study area for the purposes of this report is considered to extend approximately 5 m beyond the limits of the subject site given the negligible indirect impacts anticipated beyond the development footprint.

The locality for the purposes of this report is the area of land within a 5 km radius of the study area.

1.6 TOPOGRAPHY, GEOLOGY AND SOILS

The study area occupies south and southwest facing slopes at an altitude from approximately 1700 m to 1810 m Australian Height Datum (AHD). The study area is gently sloping.

The study area is underlain by Silurian granodiorite (Ecology Australia 2002) as evidenced by the granite outcrops throughout. Soils are alpine humus soils, comprising sandy clay loams.

There are a number of watercourses within the study area the most significant of which is Blue Cow Creek. The other watercourses are minor 1st order watercourses which drain to Blue Cow Creek.

1.7 DISTURBANCES

The study area is relatively undisturbed, being dominated by native vegetation with only occasional minor occurrences of cosmopolitan weed species such as *Acetosella vulgaris* (Sheep Sorrel). There is evidence of disturbance associated with previous tree removal and pruning (see photo 8) and ongoing grooming, which has marked the top of larger rocks and resulted in damage to vegetation growing over these rocks (see photo 4).

The previous tree removal was associated with the lower traverse and the Powder Valley Tow, which has long been removed. The study area is regularly groomed during winter when snow cover is sufficient. Despite this, the vegetation, apart from that surrounding large rocks in places that are accessible by groomers, is in excellent condition with negligible evidence of any adverse impacts associated with grooming or snowriding.



Photo 8: A Snow Gum within the study area showing where a limb has been removed some time ago. Despite the removal of a limb the tree has survived.

1.8 PLANNING AND LEGISLATION

It is not the intention of this assessment to document all the legislation and planning instruments that are relevant to the proposal. A detailed analysis of the statutory environment is provided in the Statement of Environmental Effects for the proposal (Dabyne Planning 2014). However, the legislation and planning instruments which are relevant to the assessment of potential impacts on terrestrial flora and fauna are discussed in brief below. The determining authority for the proposal is the NSW Department of Planning and Infrastructure (DOPI).

Environment Protection and Biodiversity Conservation Act 1999

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a national scheme for protecting the environment and conserving biodiversity values. Approval from the Commonwealth Minister is required under the EPBC Act if the action will, or is likely to, have a significant impact on matters considered to be of national environmental significance (NES matters). NES matters relevant to the proposal include species and ecological communities that are listed under the Act. The EPBC Act does not define significant impact but identifies matters that are necessary to take into consideration.

Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EPA Act) is the principle planning legislation for NSW, providing a framework for the overall environmental planning and assessment of development proposals. This proposal is to be assessed under Part 4 of the EPA Act. The EPA Act places a duty on the determining authority to adequately address a range of environmental matters including the maintenance of biodiversity and the likely impact to threatened species, populations and communities. Assessment of threatened species, populations and community considerations usually occurs under Section 5A of the EPA Act relating to 7-Part Tests of Significance.

Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) aims to protect and encourage the recovery of threatened species, populations and communities listed under the Act. Obligations on determining authorities include the consideration of threatened species, populations, endangered communities and recovery plans in fulfilling their statutory responsibilities under the EPA Act. The Act requires the completion of a Species Impact Statement where a significant impact is considered likely on a threatened species, population or community listed under the Act.

Fisheries Management Act 1994

The Fisheries Management Act 1994 (FM Act) sets out to conserve fish stocks and key fish habitats, threatened species, populations and ecological communities of fish and marine vegetation and biological diversity. Obligations on determining authorities include the consideration of threatened species, populations, endangered communities and recovery plans listed under the FM Act in fulfilling their statutory responsibilities in the development approvals process under the EPA Act.

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

State Environmental Planning Policy (Kosciuszko National Park—Alpine Resorts) 2007 identified the Minister for Planning as the determining authority for development within the NSW Alpine Resorts. SEPP (Kosciuszko National Park—Alpine Resorts) 2007 requires the Minister for Planning to refer for comment any development application in the Alpine Resorts to the Director General of the NSW Office of Environment and Heritage (OEH).

2 Methods

2.1 DATABASE AND LITERATURE REVIEW

A review of relevant information was undertaken prior to the commencement of field studies. Databases and other sources were searched to generate a list of species that have been recorded within the locality and included:

- the available literature including relevant flora and fauna studies, topographic maps, aerial photographs and draft plans pertaining to the proposal
- The Atlas of NSW Wildlife for threatened flora and threatened fauna species – last searched on 21 February 2014
- The EPBC Act Protected Matters Search Tool for matters of national environmental significance – last searched on the 21 February 2014.

Data gathered during all field studies and the literature review was analysed and interpreted in accordance with the provisions of legislation and planning controls pertaining to flora and fauna. Threatened and migratory species, threatened populations and Endangered Ecological Communities (EECs) that have been recorded, or have the potential to occur within the locality have been assessed for their likelihood to occur in the study area (Appendix A). All listed species and EECs considered likely to occur within the study area, or to be affected by the proposal, require consideration pursuant to Section 5A of the (EPA Act) and under the EPBC Act.

2.2 FIELD SURVEYS

ELA conducted flora and fauna surveys within the study area and surrounds on 24 and 25 February 2014.

2.2.1 Flora Surveys

A detailed botanical survey was conducted in the study area by ELA Senior Ecologist Ryan Smithers. Specific searches for plant species of conservation significance known from the locality were conducted using the Random Meander method targeting areas of potential or suitable habitat.

Community Identification and Floristic Audit

The Random Meander technique documented by Cropper (1993) was used across the study area in general, to document the flora species present, including those of conservation significance, and the location and extent of vegetation communities including any EEC encountered. All flora species encountered along the length of the random meander traverse were identified to the genus and species level where practicable.

The vegetation was surveyed at all levels present: the canopy (trees), understorey (shrubs), and groundcover plants (plants less than one metre in height). A description of the vegetation was then prepared with general observations made of the wider area. The vegetation was assessed according to the floristic and structural classifications of Ecology Australia (2002).

Limitations

The floristic audit undertaken recorded as many species as possible and provides a comprehensive but not definitive species list. More species would probably be recorded during a longer survey over more seasons and years. Nevertheless, the techniques used in this investigation are considered adequate to gather the data necessary to identify potential ecological constraints to the proposed development.

Flora Survey Effort

The flora survey effort employed a total of 12 person-hours as documented in **Table 1**.

Table 1: Flora survey effort employed over the study area.

Date	Method	Effort	Target Species
24 February 2014	Random meander and targeted search	6 person-hours	All flora species
25 February 2014	Random meander and targeted search	6 person-hours	All flora species
TOTAL FLORA SURVEY EFFORT		12 PERSON HOURS	

2.2.2 Fauna Surveys

Field investigations for fauna were conducted by ELA in the study area and immediate surrounds concurrently with the flora surveys on 24 and 25 February 2014.

Diurnal Surveys

Specific searches were conducted for habitats or resources of relevance for those threatened fauna species known from alpine and subalpine areas, and which might be anticipated to occur given the vegetation communities and habitats present. In particular targeted searches were undertaken for evidence of the *Mastacomys fuscus* (Broad-toothed Rat), *Cyclodomorphus praealtus* (Alpine She-oak Skink), *Liopholis guthega* (Guthega Skink), *Callocephalon fimbriatum* (Gang-gang Cockatoo), *Pachycephala olivacea* (Olive Whistler), *Petroica rodinogaster* (Pink Robin) and *Petroica phoenicea* (Flame Robin).

Opportunistic fauna surveys involved observations of animal activity, habitat surveys and searches for indirect evidence of fauna. Diurnal mammal searches were conducted in areas of potential habitat across the study area, with emphasis on searches for scats, tracks, burrows, diggings and scratchings. Searches were also undertaken around the bases of rocks, including all rocks proposed for removal, for evidence of the burrow networks used by the Guthega Skink.

Opportunistic records of all fauna species observed were maintained and an inventory compiled of all species recorded during the current investigations.

Targeted Reptile Surveys

Targeted reptile surveys were undertaken throughout the study area targeting suitable habitats for the Guthega Skink. The study area was traversed slowly and searches undertaken for reptiles by scanning rocks, vegetation and the ground with binoculars. Reptiles were caught and identified where possible. Searches were also undertaken around the bases of rocks, including all rocks proposed for removal, for evidence of the burrow networks used by the Guthega Skink.

Habitat Analysis

A description of the fauna habitats in the study area was prepared because the type of habitat in an area influences which animals occur there, as well as diversity and abundance. This habitat assessment also has an important role in predicting threatened fauna likely to occur in an area. The information collected usually includes the type of vegetation present, the presence/absence of rock habitats, tree hollows, ponds, streams, wetlands, foraging substrates and other features likely to attract threatened fauna. The study area was traversed to identify habitat components, which were recorded and described.

Limitations

The results of fauna surveys can be optimised by conducting investigations over a long period to compensate for the effect of unfavourable weather, seasonal changes and climatic variation. In general, the longer the survey the more species will be detected. Results can also be improved by using a wide range of techniques, since some species are more likely to be detected by a particular method.

However, surveys are subject to constraints that determine the amount of time allocated, the methods used and the timing of the work. Thus, the results should be viewed in the light of these limitations. The fauna detected during the survey period are a guide to the native fauna present, but are by no means a definitive list of the species occurring in the study area. Nevertheless, the techniques used in this investigation are considered adequate to gather the data necessary to identify potential ecological constraints to the proposal.

Survey Conditions

Survey conditions during the diurnal fauna survey and habitat analysis are detailed in **Table 2**.

Table 2: Fauna survey conditions

Date	Survey Type	Temperature	Wind	Cloud	Rain
24 February 2014	Diurnal	15 – 20 °C	Light SSW-SSE	1/8	Nil
25 February 2014	Diurnal	14 – 19 °C	Light W	3/8	Nil