

3 Results

3.1 DATABASE AND LITERATURE REVIEW

Appendix A provides a list of threatened species that have been recorded from database searches within a 5 km radius of the study area with the status of each species listed as Endangered (E) or Vulnerable (V). The potential for each of these species to occur in the study area and the importance of the habitats are also discussed in Appendix A, and a decision made regarding the need for further assessment in this report.

3.2 FLORA

The vegetation within the study area has been typed with reference to the classifications of Ecology Australia (2002). Four vegetation communities have been identified within the study area and immediate surrounds, Tall Alpine Heath with and without Eucalypts, Open Heath, Upland Bog – Wet Heath, and Rocky Outcrop Heath – Podocarp Heath, as shown in **Figure 2**.

There are considerable ecotones between the vegetation communities within the study area given the complexity of key variables such as drainage, slope and rockiness. This has resulted in a complex mosaic of vegetation communities with considerable fine scale heterogeneity.

3.2.1 Tall Alpine Heath with and without Eucalypts

Tall Alpine Heath with and without Eucalypts occurs throughout the study area and immediate surrounds. Where a canopy is present, it is dominated by *Eucalyptus niphophila* (Snow Gum) to a height of approximately 8 m and projective foliage cover (PFC) of up to 30%. The understorey is dominated by *Prostanthera cuneata* (Alpine Mint Bush), *Nematolepis ovatifolia*, *Ozothamnus secundiflorus* (Cascade Everlasting), *Ozothamnus alpinus* (Alpine Everlasting), *Olearia phlogopappa* (Dusty Daisy-bush), *Orites lancifolius* (Alpine Orites), *Acrothamnus montanus*, *Grevillea australis* (Alpine Grevillea), *Pimelea ligustrina* subsp. *ciliata* and around the bases of rocks, *Melicytus dentatus* (Tree Violet), to a height of 0.5-1 m with PFC of up to approximately 80%.

The groundcover includes species such as *Poa costiniana* (Bog Snow-grass), *Poa fawcettiae* (Smooth Blue Snowgrass), *Poa hiemata* (Soft Snowgrass), *Hovea montana* (Alpine Hovea), *Acaena novae-zelandiae* (Bidgee Widgee) and in places, *Chionochoa frigida* (Ribbony Grass). In cracks and at the base of rocks *Polystichum proliferum* (Mother Shield Fern) and *Blechnum penna-marina* subsp. *alpine* (Alpine Water Fern) also occur in places.

3.2.2 Open Heath

Areas of Open Heath occur in the eastern parts of the study area in association with large area Bog at the head of Blue Cow Creek. The Open Heath is ecotonal between the Tall Alpine Heath without Eucalypts and the Snowpatch vegetation communities of Ecology Australia (2002), with a high cover of grasses and scattered patches of shrubs, as shown in Photo 3.

The most common grasses are *Poa costiniana* and *Poa fawcettiae*, which occur with a range of forbs such as *Craspedia aurantia*, *Pimelea alpina*, *Aciphylla simplicifolia* (Mountain Aciphyll), *Aciphylla glacialis* (Mountain Celery), *Asperula gunnii* (Mountain Woodruff), *Celmisia pugioniformis*, *Oreomyrrhis eriopoda* (Australian Carraway), *Viola betonicifolia* (Native Violet), *Senecio gunnii*, *Rytidosperma nudiflorum*, and *Carex breviculmis*.

Immediately adjacent to Blue Cow Creek there are small areas of Sod Tussock Grassland and Short Alpine Herbfield which includes species such as *Empodisma minus* (Spreading Rope Rush), *Baeckea gunniana* (Alpine Baeckea), *Epacris glacialis*, *Microseris lanceolata* (Murrnong), *Brachyscome scapigera* (Tufted Daisy), *Pentachondra pumila* (Carpet Heath), and *Luzula novae cambriae*.

3.2.3 Upland Bog – Wet Heath

The study area includes fairly extensive areas of Upland Bog and Wet Heath in association with Blue Cow Creek. Typically, they are dominated by the shrubs *Richea continentis*, *Epacris paludosa* (Swamp Heath), *Baeckea gunniana*, *Empodisma minus* and in Wet Heath areas, *Oxylobium ellipticum*, *Nematolepis ovatifolia*, and *Prostanthera cuneata*. The groundcover includes, in the wettest areas, *Sphagnum cristatum* (Sphagnum Moss), *Carpha nivicola*, *Astelia psychrocharis* (Kosciuszko Pineapple-grass), *Oreobolus distichus*, *Carex canescens* and *Ranunculus graniticola* (Granite Buttercup), *Aciphylla glacialis* and in slightly drier areas *Poa costiniana*, *Celmisia costiniana*, *Stylidium graminifolium* (Grass Trigger-plant), *Craspedia aurantia*, *Leptorhynchus squamatus* subsp. *alpinus* (Scaly Buttons), *Pimelea alpina*, *Scleranthus biflorus* (Two-flowered Knawel), *Brachycome tenuiscapa* and *Lycopodium fastigiatum* (Mountain Clubmoss).

3.2.4 Rocky Outcrop Heath – Podocarp Heath

This community occurs in association with the patches of boulderfield which occur through the central parts of the study area. The community is characterised by a largely closed heath dominated by *Podocarpus lawrencei* (Mountain Plum Pine) and *Baeckea utilis* (Mountain Baeckea) which typically cover the boulders, as shown in Photo 6. Other species which occur include *Epacris paludosa*, *Prostanthera cuneata*, *Richea continentis*, *Orites lancifolius* and *Tasmannia xerophila*. The presence of many species associated with Wet Heath and Bog is an artefact of the close association between boulderfields and bog along this section of Blue Cow Creek and its tributaries.

3.2.5 Flora Species

A total of 73 flora species were recorded within the study area including 68 native species and five introduced species. This species list appears in Appendix B. One threatened flora species, *Ranunculus anemoneus* (Anemone Buttercup) was detected at one location approximately 50 m to the north of the study area where approximately 20 plants were observed in a small grassy patch amongst heath (see Figure 2). *R. anemoneus* is common in the Guthega area, and no plants will be adversely affected by the proposal, as no plants occur within close proximity to the proposed activities.

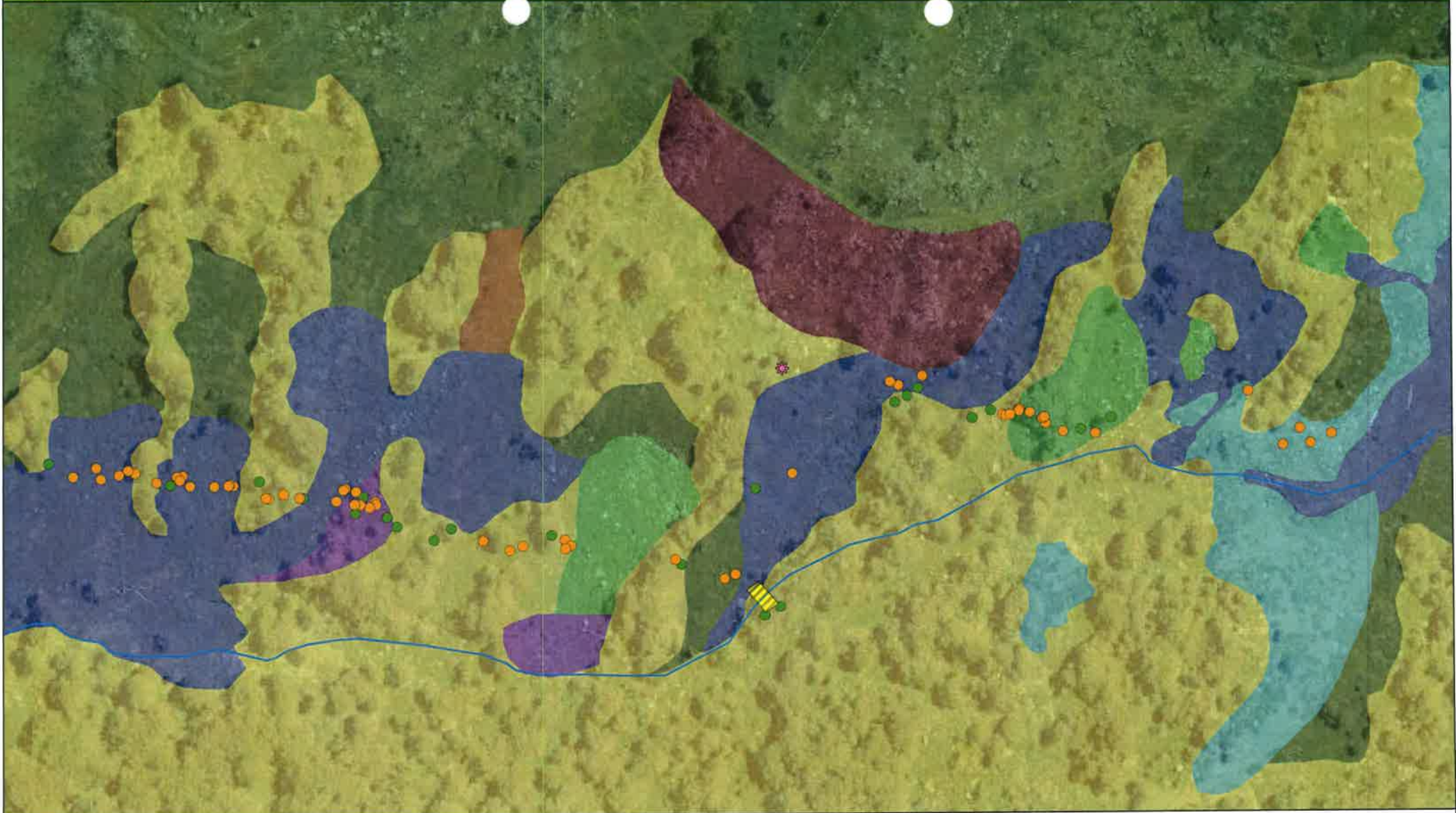


Photo 9: The mosaic of Tall Alpine Heath with and without Eucalypts, Wet Heath and Bog in the central parts of the study area and Blue Cow Creek.
















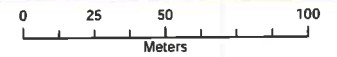
Photo 10: Some the Upland Bog associated with areas of impeded drainage perched above Blue Cow Creek.

Figure 2. Vegetation within the study area and immediate surrounds



Legend

-  Bridge Location
-  Anemone Buttercup *Ranunculus anemoneus*
-  Rock to be removed
-  Tree to be removed/pruned
-  Approximate Alignment of Blue Cow Creek
-  Bog/Wet Heath
-  Boulderfield
-  Disturbed/Exotic
-  Open Heath
-  Recently Burnt Tall Alpine Heath with Eucalypts
-  Tall Alpine Heath with Eucalypts
-  Tall Alpine Heath without Eucalypts
-  Wet Heath



Datum/Projection:
GDA 1994 MGA Zone 55



Data Sources:
Six Maps

3.3 FAUNA

3.3.1 Fauna Habitats

The study area contains a limited range of fauna habitats given its small size. However, the study area is surrounded by extensive areas of remnant native vegetation and as such, a relatively diverse range of native fauna are likely to occur there from time to time. The heath and bogs provide habitat value for native birds, terrestrial mammals, microchiropteran bats, reptiles, amphibians and invertebrates.

In particular the study area and immediate surrounds provide known habitat for the Broad-toothed Rat. The species' characteristic scats were observed in and surrounding the study area in association with the heath and rock habitats. The mosaic of wet areas and surrounding heaths in along Blue Cow Creek provide excellent habitat for the species, which is likely to be relatively widespread in the Perisher Resort area. Other common small mammal species such as *Antechinus swainsonii* (Dusky Antechinus) and *Rattus fuscipes* (Southern Bush Rat) are also likely to occur within the study area. A range of microchiropteran bat species may forage within the study area on occasion during summer, however given the altitude, it is unlikely that there would be any important roosts within the study area.

The study area provides a habitat for a range of reptiles associated with rock outcrops and alpine heaths including the *Eulamprus tympanum* (Southern Water Skink), *Pseudemoia entrecasteauxii* (Mountain Log Skink), and *Drysdalia coronoides* (White-lipped Snake) all of which were recorded within the study area during the survey period. Both the Southern Water Skink and Mountain Log Skink are abundant within the study area with many individuals seen basking on rocks and vegetation.

Habitats within the study area for the Alpine She-oak Skink are marginal, given the predominance of dense heath and the paucity of the grasslands favoured by the species. The study area does provide potential habitat for the Guthega Skink, however no Guthega Skinks were observed within the study area or immediate surrounds despite two days of targeted searches, in good conditions when many other reptiles were active. There are no records of the Guthega Skink at Guthega, however surveys for the species have been relatively limited (M. Schroder pers. comm. 2014).

The Mountain Plum Pine within the study area provides foraging resources for *Burramys parvus* (Mountain Pygmy-possum). The primary boulderfield nesting/hibernating sites for the Mountain Pygmy-possum are 600m-750m to the northwest and northeast of the study area. However there are secondary boulderfields in association with Blue Cow Creek, including three within the study area and immediate surrounds. It is possible that the Mountain Pygmy-possum forages and/or shelters within the study area from time to time, however the boulderfields within the study area are not identified breeding sites or are they likely to be important hibernating sites (L. Broome pers. comm. 2011).

There are limited habitats for amphibians given the small size and general absence of any larger pools or slow flowing water. The Common Eastern Froglet *Crinia signifera* is likely to be the only amphibian that would occur within the study area.

The study area provides some potential foraging and nesting habitat for a range of birds associated with alpine and subalpine areas including the threatened species the Gang-gang Cockatoo and Flame Robin, both of which were observed within the study area during the survey period. However it is unlikely that the Gang-gang Cockatoo would roost or nest within the study area given the paucity of hollow-bearing trees and its likely preference for nearby montane forests.

Habitat connectivity to adjacent areas of native vegetation is excellent with extensive areas of relatively undisturbed native vegetation occurring in all directions.



Photo 11: The study area and immediate surrounds include a number of boulderfields.



Photo 12: This area of fauna activity beneath a rock at the proposed bridge location was a focus of the targeted reptile surveys. However only Southern Water Skinks were seen in this area and there were small numbers of Broad-toothed rat scats, indicating that the site is unlikely to comprise a Guthega Skink burrow.



Photo 13: Mountain Log Skinks are abundant within the study area and surrounds.



Photo 14: Southern Water Skinks are also abundant within the study area and surrounds, particularly near water, but elsewhere in association with rocks.

3.3.2 Fauna Species

Targeted surveys during the survey period and earlier in the summer resulted in 16 native and one exotic fauna species being detected within or immediately surrounding the study area, including two mammals, 11 birds, three reptiles and one amphibian, as listed in **Table 4**. As previously mentioned, evidence of the threatened Broad-toothed Rat was recorded in and adjacent to the study area. Faecal pellets were observed in places although no nests were located in the study area or immediate surrounds. The Flame Robin and Gang-gang Cockatoo were also observed the study area or immediate surrounds.

Table 3: Fauna species recorded during fauna surveys

Category	Common Name	Scientific Name	Detection Method
Mammals	Broad-toothed Rat	<i>Mastacomys fuscus</i>	Scats
	Hare*	<i>Lepus timidus</i> *	Observed
Birds	Australian Magpie	<i>Gymnorhina tibicen</i>	Call recognition
	Brown Falcon	<i>Falco berigora</i>	Observed
	Brown Thornbill	<i>Acanthiza pusilla</i>	Observed
	Crimson Rosella	<i>Platycercus elegans</i>	Observed
	Flame Robin	<i>Petroica phoenicea</i>	Observed
	Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Observed
	Little Raven	<i>Corvus mellori</i>	Observed
	Pied Currawong	<i>Strepera graculina</i>	Call recognition
	Australasian Pipit	<i>Anthus novaeseelandiae</i>	Observed
	Silvereye	<i>Zosterops lateralis</i>	Observed
	White-browed Scrubwren	<i>Sericornis frontalis</i>	Observed
Reptiles	Mountain Log Skink	<i>Pseudemoia entrecasteauxii</i>	Observed
	Southern Water-skink	<i>Eulamprus tympanum</i>	Observed
	White-lipped Snake	<i>Drysdalia coronoides</i>	Observed
Amphibians	Common Eastern Froglet	<i>Crinia signifera</i>	Call recognition

Bold denotes threatened species *denotes exotic species